

Access 2007

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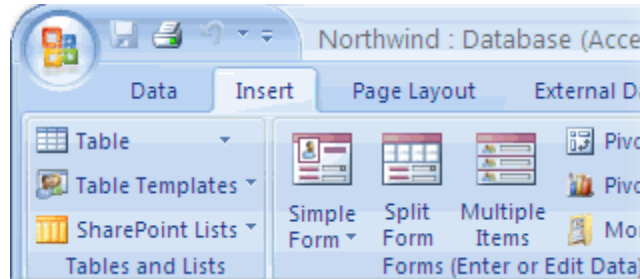
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What is New in Access 2007

If you are familiar with previous versions of Access, there are a large number of new features and a completely new interface in Access 2007.

New Interface Design



Commands are now organized using a new action tab scheme. Under each tab are the commands relevant to the action described on the tab. This command set is referred to as the 'ribbon.' Finally, Access 2007 features contextual tabs showing data that is relevant only to the current object you are working on.

Office Menu



In the upper left-hand corner is the Office Menu, denoted by the Microsoft Office logo. If you click the Office Menu, you might recognize it as being very similar to the 'File' menu in previous version of Access or other programs.

File management commands are listed on the left-hand side of the menu, and any recently opened database files are listed on the right. You can also modify options of Access itself by clicking the Access Options button, or close the program by clicking the Exit Access button.

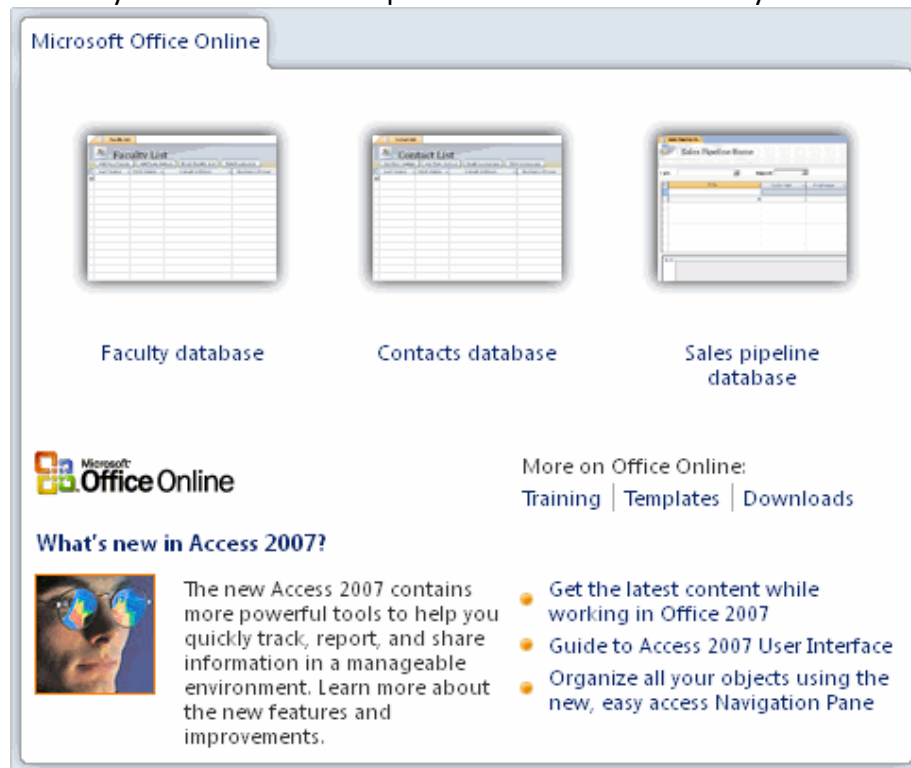
Quick Access Toolbar



To the immediate right of the Office Menu is the Quick Access Toolbar. This toolbar contains quick links to common tasks, such as the Save, Print, and Undo (listed left-to-right in the diagram). You can also customize the Quick Access toolbar to include whatever icons you like. We will explore the Quick Access toolbar in the next section of this manual.

Microsoft Office Online

The center of the Access window is a special page that extracts content from Microsoft Office Online (a service provided over the Internet). Microsoft Office Online provides quick links to different templates, training material, and other downloads. It also provides links directly to Office Online where you can read about updates to Office 2007 as they become available.



Status bar

Ready Num Lock Finally, at the very bottom of the Access window is the status bar. This bar will give information about the status of Access, if any particular lock keys are enabled on your keyboard, which view is currently active, and more.


Object Tabs

In previous versions of Access, any open database object was opened in its own window and designed to 'float' inside the Access Screen. When several database objects were open at once, it was difficult to navigate through all of the windows easily. Access 2007 has solved that problem by using tabs:



Simply click any of the tabs visible on the top to show the database object. Opening many database objects will create left and right facing arrows (◀ and ▶); click on the arrow to scroll that direction through the open database objects. If you want to close an object you are no longer using, click the Close button (✕) located beside the tabs.

Help Button

 The Help button, located directly under the title bar, launches the Access help screen:



Click a topic to view help about that particular subject.

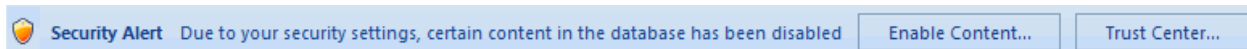
The Trust Center

The terms computer security, identity theft, and privacy are being used more and more all the time. There are a few bad apples out there that like to create viruses and spyware for the purpose of disrupting day-to-day business. The Microsoft Windows family of operating systems, as well as a number of third-party developers, work hard every day to keep your private and sensitive data safe. So to does the Office 2007 suite.

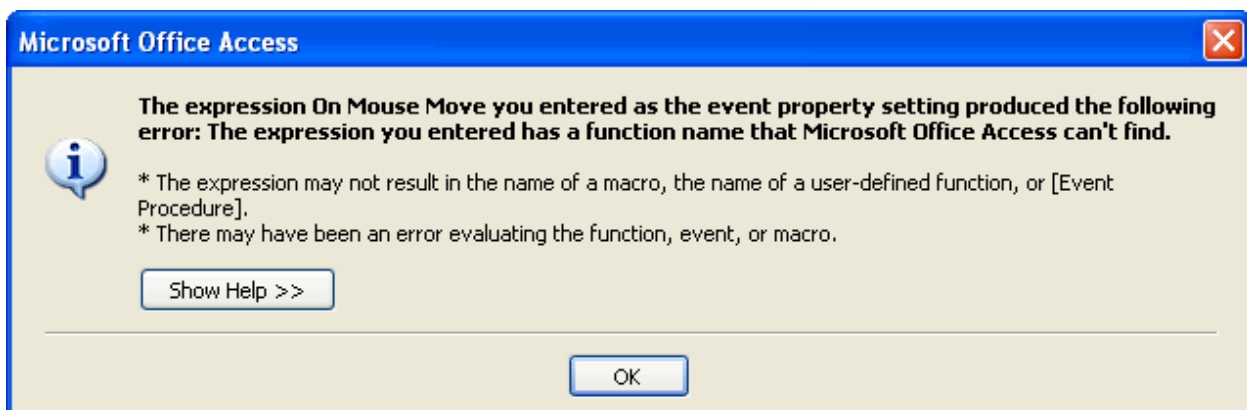
In this lesson we will explore some of the measures taken by Access 2007 to keep your computer and yourself from being a victim of an attack or being disrupted while you work.

Warnings You May See when Opening a Database

If you recall the last Step-By-Step exercise, we encountered a warning stating that Access has prevented a file from being opened because of the security settings that have been enabled on your computer:



You might also run into other warnings that state Access cannot perform a certain action because a non-standard operation was encountered or some part of the database file seems to be missing. It is possible that the following warning might appear not because a problem was detected, but because a certain section of the database might not be fully constructed:

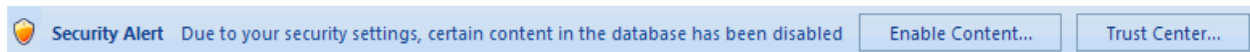


Don't panic! These warnings are designed to protect you, not scare you. Should you encounter messages like the ones above, think why it may have occurred. If you received the file from someone else, tell them you have encountered a problem before opening the file. If you are unsure about the file, contact your organization's IT department for help; they may be able to diagnose your problem and provide a solution. It may even be that your security settings are a

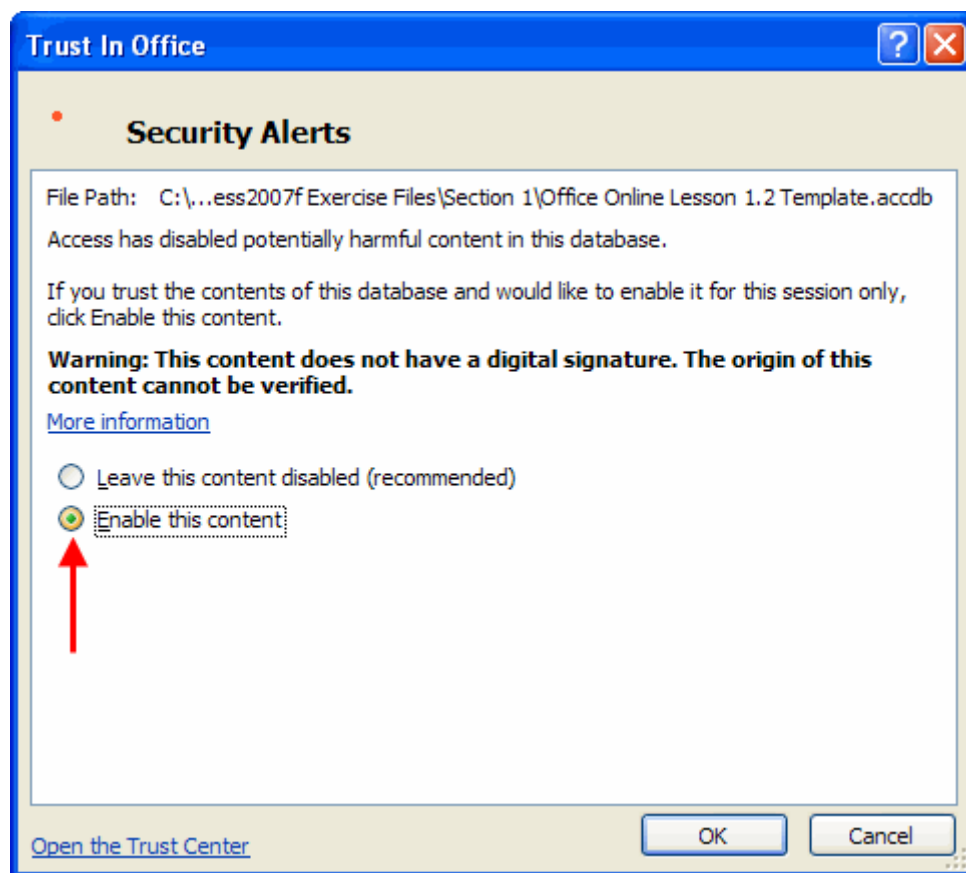
bit too high for this application (which is not always a bad thing). We will discuss what to do in situations like this in this lesson.

Enabling Content

If you are sure the file you are opening is safe, or you trust the person it came from, simply click the Enable Content button in the bar that appears under the ribbon:



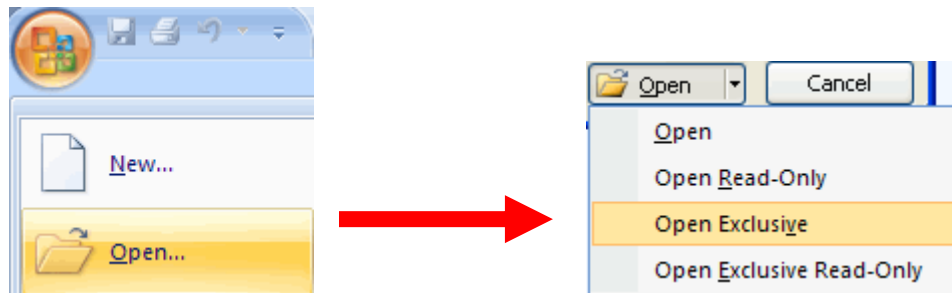
Doing so will show the Trust In Office dialogue box:



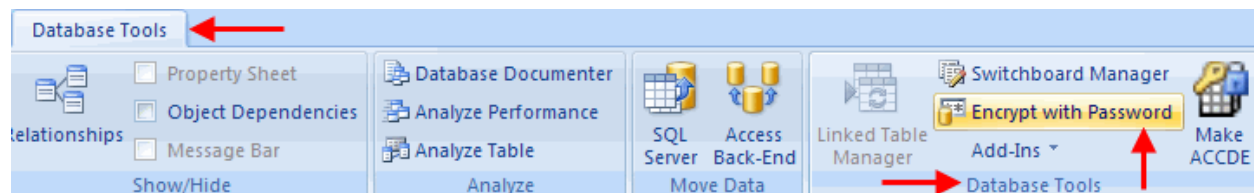
In the picture above, Access gave you a warning because it could not identify who made the file. This does not necessarily mean that it came from an untrustworthy source; perhaps whoever made the file did not bother to apply a digital signature (described in the next section) or security certificate. If you are sure the content is safe, simply click the Enable this content radio button and then click OK. The file will then open normally.

Assigning a Password to your Database

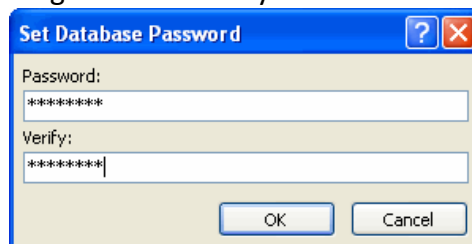
To set a password, a file must first be opened for exclusive use. To do so, close any open databases and then click Office Menu → Open. Browse to the database file you wish to open. Instead of clicking Open, click the small pull-down arrow attached to the Open button and click Open Exclusive:



Then, open the database file you wish to protect. Click the Database Tools tab, and then click Encrypt with Password in the Database Tools section of the ribbon:



When the Set Database Password dialogue box appears, type the password you want to use in the Password field, then type it again in the Verify field:



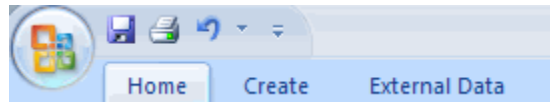
Should you need to remove the password, click the Database tools tab again and click Remove Database Password and Encryption:



Then, enter the password a final time to confirm the removal of the password.

Using the Quick Access Toolbar

In the previous lesson, we introduced the new layout changes to Access 2007. In this section, we will learn a little bit more about each part of the new interface and how it works. This lesson will focus on features and customization options available with the Quick Access toolbar, located in the upper left-hand corner of the screen:



About the Default Buttons

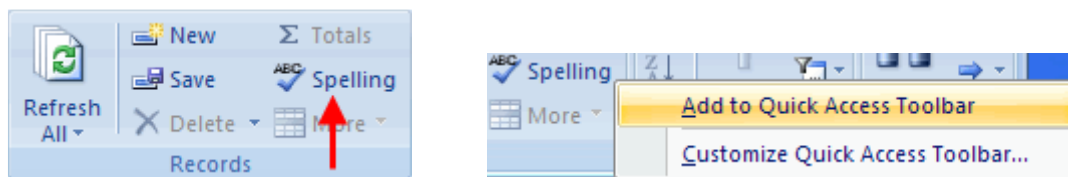
Access features three default commands in the Quick Access toolbar:



Adding Buttons

As you become more familiar with Access you might find it handy to have another command quickly available for use. Access allows you to add the command to the Quick Access toolbar.

To add this command to the Quick Access toolbar, simply **right-click** the Spelling command and click **Add to Quick Access Toolbar**:

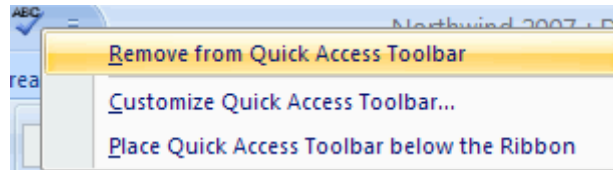


The command (denoted by the small 'ABC' icon) will be placed in the Quick Access toolbar:



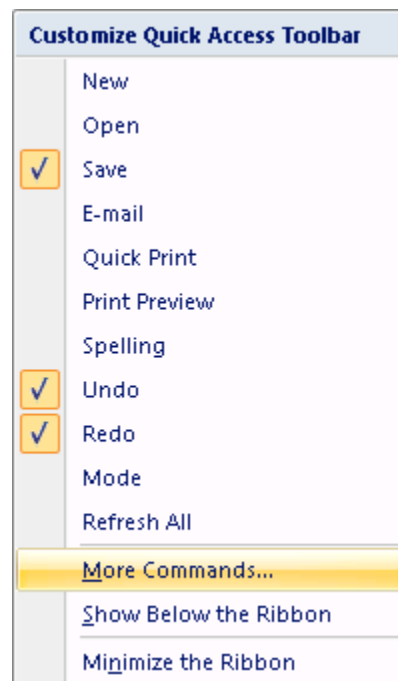
Removing Buttons

If you no longer use a certain command or your Quick Access toolbar is getting a bit too filled with icons, you can remove them easily at any time. Simply right-click on any icon you no longer use and click Remove from Quick Access Toolbar:



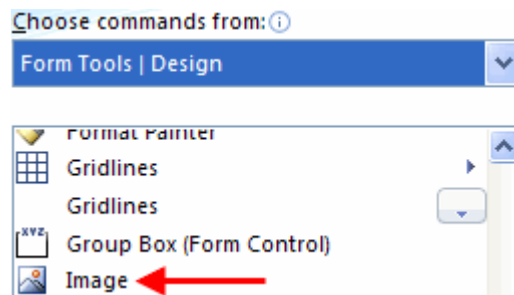
Customizing the Toolbar

As you gain familiarity with Access (and other Office 2007 programs) you have the ability to customize how the Quick Access toolbar looks all at once versus having to add icons one by one. To do this, click the small pull-down arrow (▼) located on the far right of the Quick Access toolbar and click More Commands:

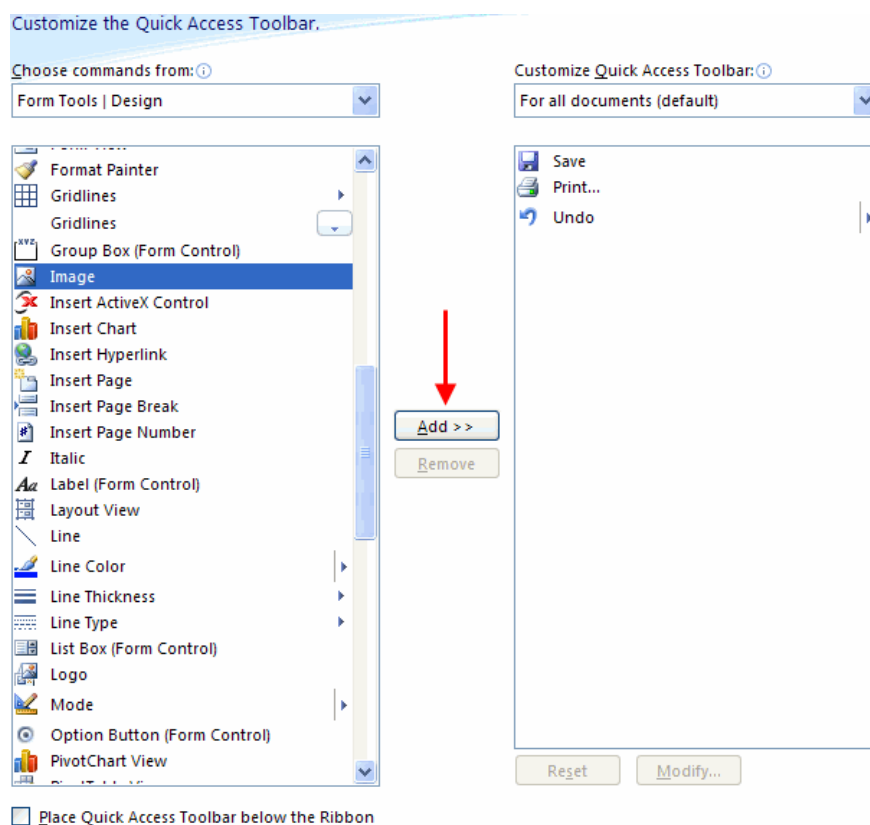


(Note that you can click any command listed here to add that command to the toolbar. The commands that are already checked are those on the toolbar; simply click them to remove them.)

Pick a listing from a particular category in order to see the commands it contains. For example, imagine you are going to make heavy use of pictures and diagrams in a database form. To do this, you will need to import each picture one at a time. Therefore, you may find it easier to add the Insert Image icon to the Quick Access toolbar so it is always accessible. Select the Form Tools - Design option and then scroll down the list of options until you find Image:

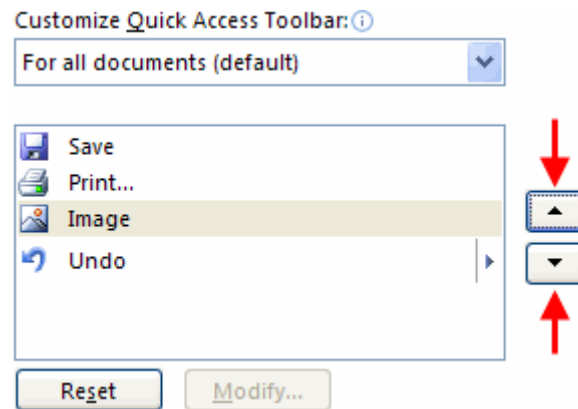


Click the Image icon to highlight it and then click the Add >> button located in the middle of the window:



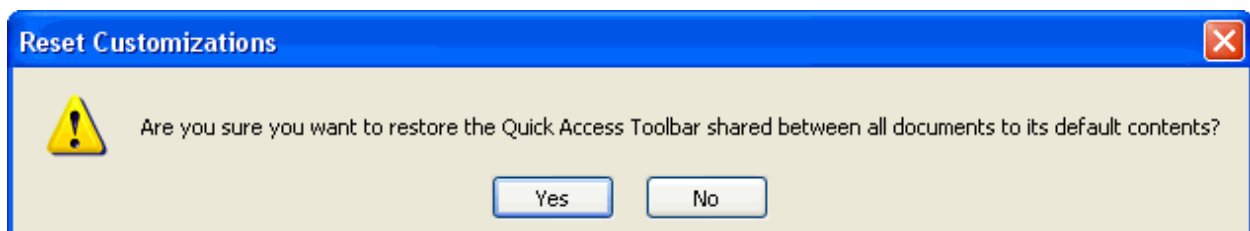
This will add the Image tool to the Quick Access toolbar list on the right-hand side of the window. By default, the command is inserted at the bottom of the list (under the Undo command).

You can change the order of any icons in the list by selecting an item in the Quick Access toolbar list and then clicking the up and down buttons on the right side of the list. Simply click an item in the list you would like to move up or down and then click the corresponding directional button:



Items listed top to bottom will be displayed from left to right in the Quick Access Toolbar. To remove an icon from the list, select the icon and click the Remove button in the middle of the window.

If at any point you want to return the Quick Access toolbar back to its original configuration, click the Reset button:



This will remove all icons except for the original three (Save, Print, and Undo).

Basics of Ribbons

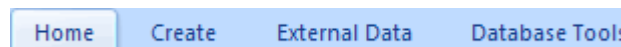
One of the biggest changes in Access 2007 is the removal of menus. Instead of having a list of menu commands to choose from (including a number of options that are grayed out and not accessible), Access 2007 features a more intuitive control system of tabs. Each tab contains a certain group of commands relevant only to the tab. The commands are listed in the ribbon.

There are 4 default ribbons:

- The Home Ribbon
- The Create Ribbon
- The External Data Ribbon
- The Database Tools Ribbon

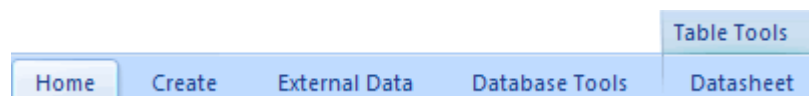
About Ribbons

There are two main types of ribbons: general (or command) and contextual. The general ribbons (and corresponding tabs) are always visible when you are viewing a database file in Access:



The command tabs listed here include many of the most common commands you will perform in Access. The Home ribbon contains the majority of the most common tasks including the ability to switch views, formatting, and filtering of data. If you want to make a new database object, click the Create tab and select the object you want to make. The External Data command tab gives you all the flexibility to import and export data to and from your database, computer, and network. The Database Tools tab gives you the ability to manage the data in your database, create macros, and view relationships.

Contextual tabs appear only when a certain type of database object is selected (or brought into context). For example, if you are looking at a table in datasheet view, a contextual tab will appear showing you the commands you can perform on the table while only in datasheet view:



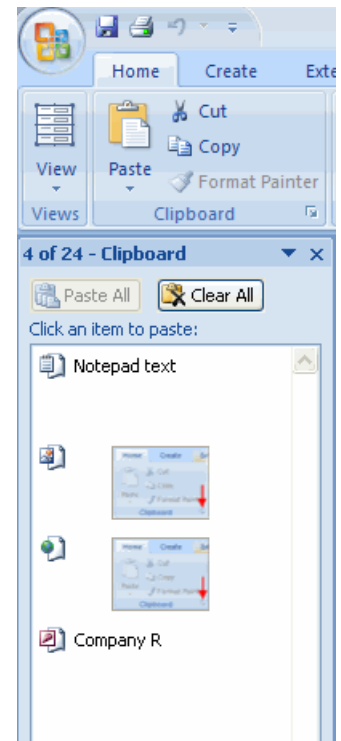
When using a command in the ribbon, simply click it with your mouse. The command will be performed, or the appropriate tool or dialogue box will appear to help you perform the task. If you are unsure what a certain command does, point to it, but do not click it.

Opening Dialogue Boxes from the Ribbon

Occasionally you will see a small arrow icon beside the name of a ribbon command category:

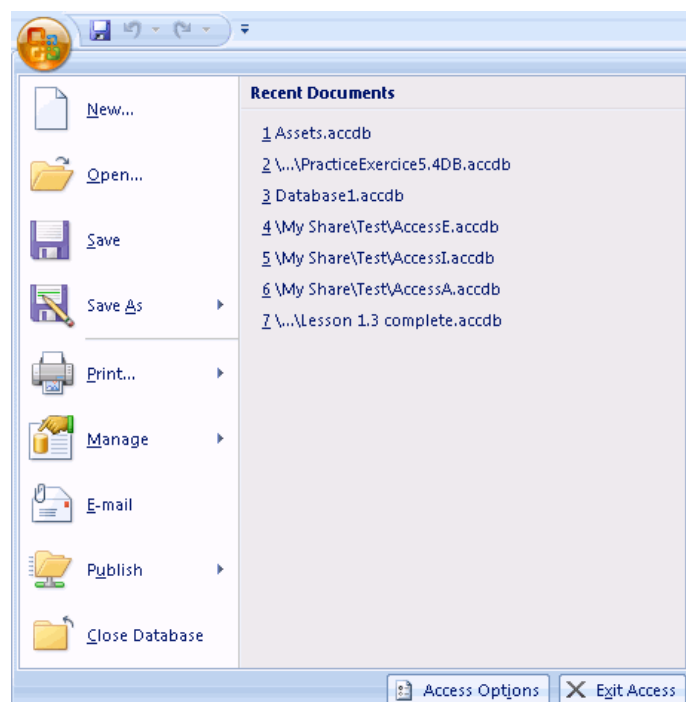


Clicking this little icon opens a new dialogue box containing more advanced functionality than is provided by the ribbon alone. In the example above, clicking the Clipboard button opens the Clipboard pane on the left side of the Access window.



About the Office Menu

The Office Menu should be pretty familiar to you now. We have learned that you can open and close files, modify the Access program options, and close Access; all by using the Office Menu. If you have used Access in the past, the Office Menu is very similar in functionality to the File menu in previous versions.



SECTION 1: Creating Relational Databases

In this section you will learn how to:

- Identify and use different types of table relationships
- Establish and use referential integrity
- Understand how referential integrity works to keep data consistent
- Recognize why database normalization is important
- Normalize a database by design and the Table Analyzer
- Understand when and where to normalize data in a table
- Create, edit, and use a switchboard
- Create and edit a modal dialogue box

Lesson 1.1: Referential Integrity

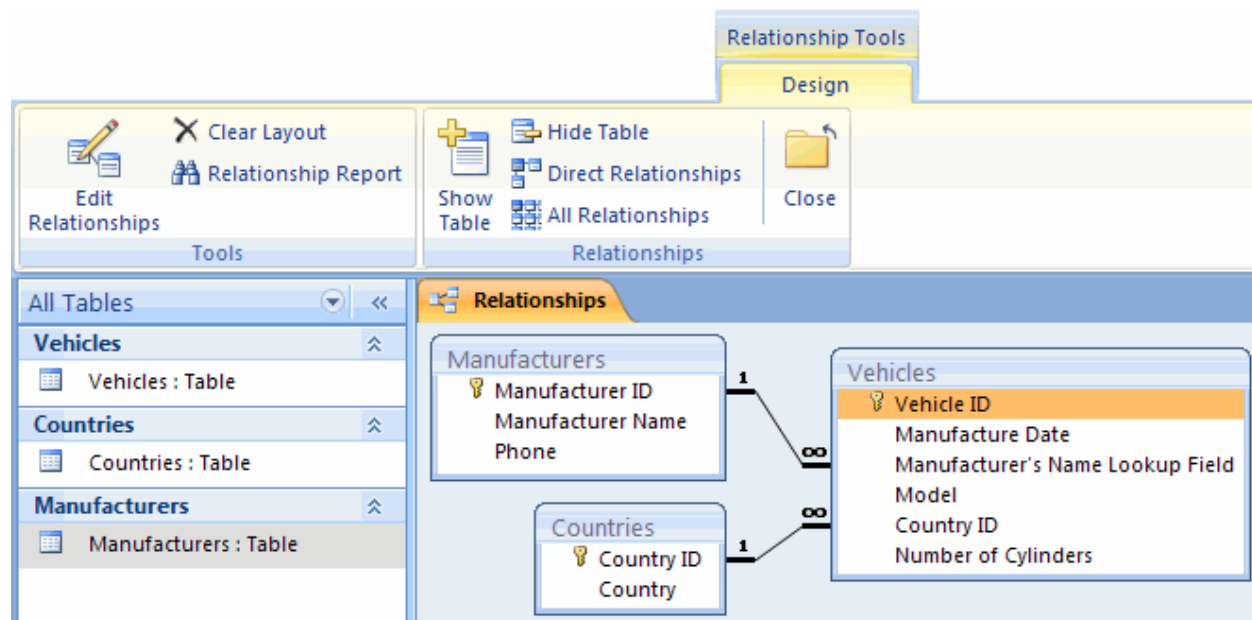
Welcome to the Access 2007 Advanced Courseware! This manual will cover some of the more advanced functionality provided by Access 2007. We will expand on the topics covered in the Intermediate Courseware as well as cover new material. We will also explore the functionality between Access 2007 and other programs, as well as the Microsoft Windows operating system.

In this lesson we will learn how to take better control of your data and make the database work for us. As the saying goes, an inch of planning equals a mile of progress. We will explore how data in a database relates to each other and how to strengthen those bonds to make your database a streamlined collection of information.

Using the Relationships View and Ribbon

We know that a database is nothing more than relevant data stored together in some logical way. Fields of information are stored together in a record, one or more records make a table, and one or more tables make a database. However, it is how these tables relate to each other that really defines a database. Relationships transform these separate lists of data into a single working unit. Let's explore how to view the relationships that exist in a database.

First, click the Relationships command in the Database Tools ribbon to view the relationships that exist in a database:



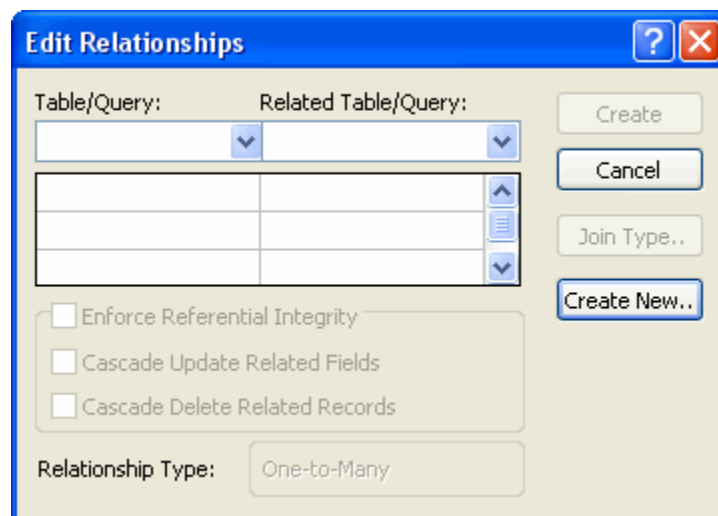
In the diagram above, we can see the details of a simple database. This database contains three tables. The Vehicles table contains vital statistics about different makes and models of vehicles.

The Manufacturers table contains contact info for the different vehicle manufacturers, and the Countries table lists the nations that produce the vehicles. Two relationships exist in this database, one connecting the data in the Manufacturers table to the vehicles in the Vehicles table. A similar relationship also exists between Countries and Vehicles. We will explore the nature of relationships later in this lesson.

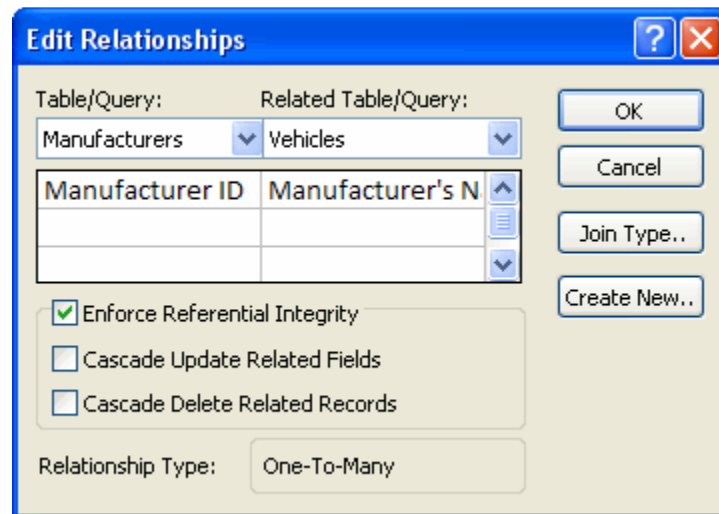
Each table represented in this diagram can be moved and resized by clicking and dragging the title bar or clicking and dragging the sides of the windows. It is not necessary to have every table in the database visible all the time; if you don't need to see a particular table, click its title bar and press Delete. Use the Show Table command (described below) to bring back a hidden table.

The Relationship Tools - Design ribbon contains commands relevant to the use of this Relationship view:

Edit Relationships Click this command to open the Edit Relationships dialogue box. The default view of the box lets you choose fields from a table or query in order to create a simple relationship by hand:



If you first select a relationship (by clicking on one of the black join lines) and then click the Edit Relationships command, you will see details pertaining to only that relationship:



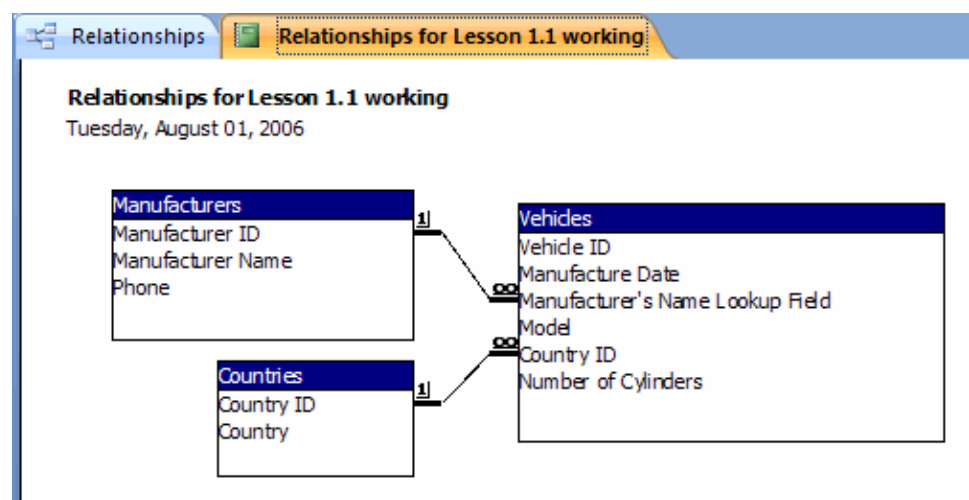
Click the Create New button to make a complex relationship by hand. If your database has been well designed, Access will be able to pick up the specifics of how one table of data relates to another automatically. One of the great things about Access' graphical interface is that you can simply drag and drop one field onto a related one. Access will examine the data and structure of each side of the relationship and create the bond.

Clear Layout

Click this to clear the tables and relationships currently displayed on the screen. This will not affect any data in the database.

Relationship Report

This command is used to create a simply report suitable for printing or e-mailing that details how the tables in your current database are related:

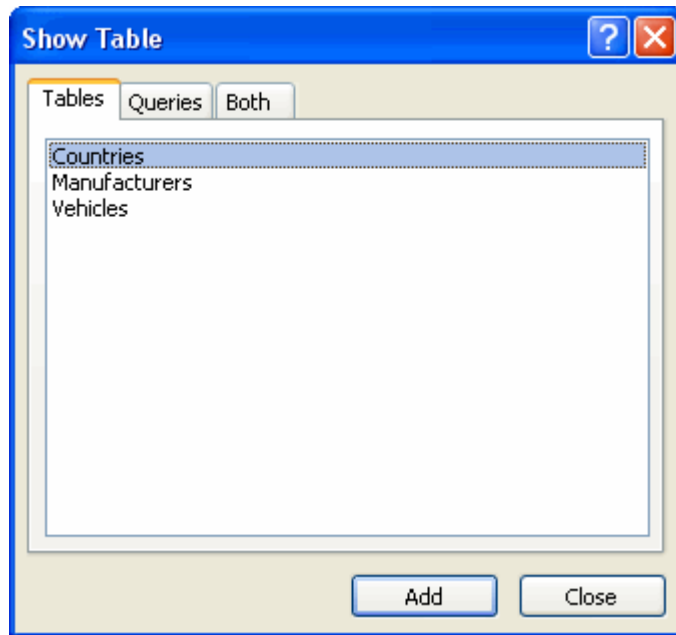


You have the option to print the report or export it to PDF or XPS and e-mail it to others in your organization. You can also save the report as you

would any other report for reference later on.

Show Table

This command will open the Show Table dialogue box.



If you have added new tables to your database or have hidden a table to make some space, you can use this command to unhide a table. At the top of the dialogue box there are tabs to switch between tables and queries. Remember that query results are essentially tables and can thusly be represented in the Relationships view.

Hide Table

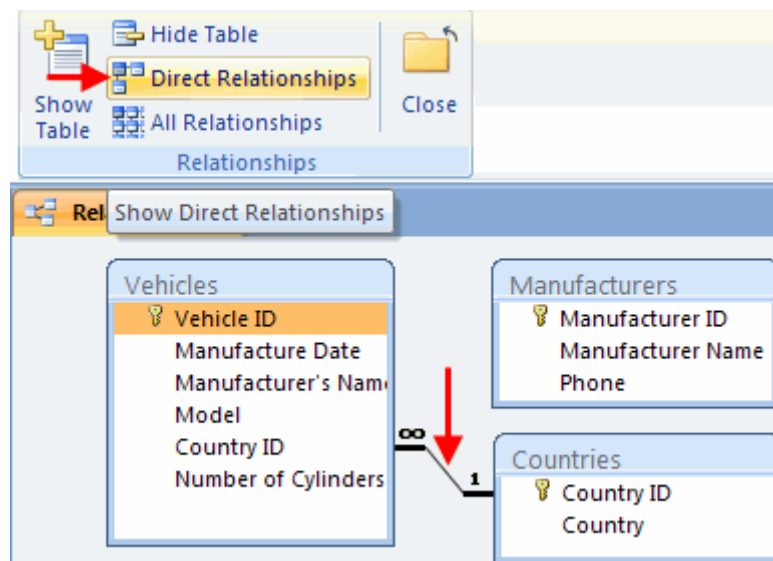
Click the title bar of any table in the Relationship view and click Hide Table to remove it from the layout.

Direct Relationships

If you need to see how a particular table relates to others in the database, and there seems to be a piece missing, select the table in question and click the Direct Relationships command. This will display any tables that are directly related to this table. For example, consider the following two tables:



The Countries table is currently selected (indicated as such because the primary key is selected). Clicking the Direct Relationships command will display all tables that share a direct link with this table:



All Relationships

Click the All Relationships command to display every table and relation in the database. Be careful; sometimes the relationship window can become crowded in a hurry, especially if your database is large in size.

One of the nice things about the Relationships view is that any changes you make to the layout can be saved. Sometimes viewing the database in a graphical way will help you and others better understand what is happening. Remember that a particular relationship layout 'snapshot' can be saved by using the Relationship Report command.

Close

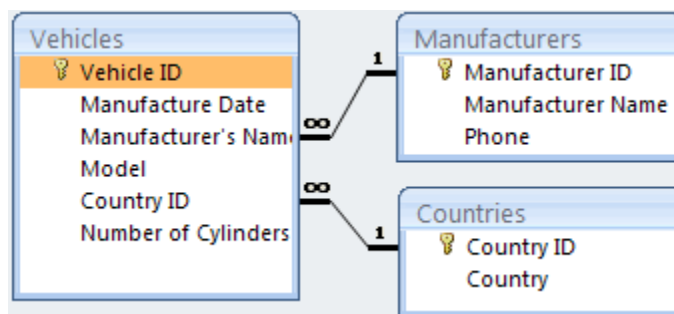
This will close the Relationships view. You can choose to save the current layout so that the next time you view the relationships they will remain in the same layout.

Types of Relationships

Databases work because of the relationships specified during the construction phase. Having large amounts of data is not very useful unless the data somehow relates to each other. Databases can contain three types of relationships: One-to-One, One-to-Many, and Many-to-Many.

A One-to-One relationship is one where each record in one table corresponds to one record in another table. For example, imagine you own a corporation and have an office building. Let's say you have a table containing employee data and a table containing office or cubicle data. At any one time in your company, one employee is assigned to one office. Therefore, each record in the Employee table and each record in the Cubicle table contain at least one piece of identical information (such as an Employee ID).

A One-to-Many relationship is the most common type of relationship in a database. Keeping with our office building database, let's say you have departments in which different employees work. One department can have many employees, while each employee works in one department. Therefore, the relationship between the tables is One-To-Many. We have already seen an example of a One-to-Many relationship:



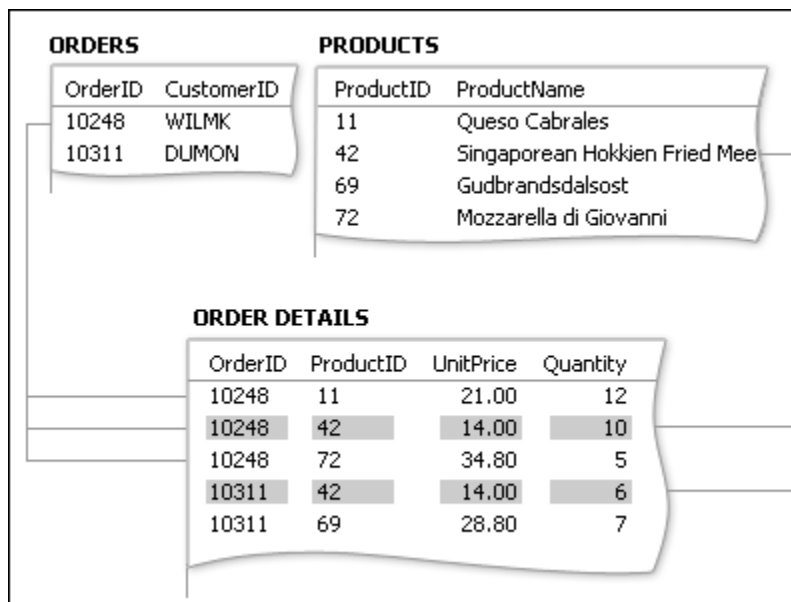
This database contains two One-to-Many relationships. Each manufacturer can be related to many vehicles, while each vehicle is made by only one manufacturer.

A Many-to-Many relationship is one of the most complex relationships to understand. As such, they are not often used in databases because they cause confusion on larger database projects. However, we will explore their use and function.

If we continue with the office building example, you know that you have employees that work in different departments. Let's take your database one step further and include the addition of a Job table. Each employee can be assigned no more than two jobs at a time, and each job must have at least three employees working on it. Therefore, each employee may have zero, one, or two jobs assigned to them while each job must have at least three Employee IDs on record.

Access 2007 features a full sample database about a fictional company called Northwind Traders which sells a variety of food products. When the database was being designed, the Northwind database engineers knew that two tables would be needed, Products and Orders. It would be obvious that one product would be sold more than once, and each order would likely contain more than one product. Therefore, a Many-to-Many relationship would be established.

However, this creates a problem. Imagine adding the Product ID to the Orders table. To have more than one product per order, you need to create a new record for each product sold per order. This creates a lot of repetition of data for every row of the same order. This also creates a lot of confusion if several people are working on the same database. The same problem would arise if you put the Order ID into the Products table. You would have records upon records stating that the same product was sold multiple times. The designers of the Northwind database handled this by creating a third table called Order Details. This creates two One-to-Many relationships out of the Many-to-Many relationship:



This is the setup employed by the Northwind sample database. The Products table contains orders about only the products. The Orders table contains only the details about who placed the order. The Order Details actually holds the bulk of the order data. Notice how the Order Details table does not have a specific single primary key like the other two tables do. Neither Order ID nor Product ID can be used as a primary key because there will almost certainly be duplicates of each. Therefore, both Order ID and Product ID together constitute a primary key. This would eliminate any duplication because the database is not set up in such a way so someone can buy ten units of product 11 and then two more units of product 11; one person would be counted as buying twelve units of product 11.

There may become a time where a Many-to-Many relationship may be needed, but the majority of the time creating two One-to-Many relationships will be sufficient.

Establishing Referential Integrity

We know that establishing relationships between different tables of data in a database will make the whole unit function together. But now that these relationships have been established, what happens to a child (or dependent) table if the data in a parent table gets deleted or modified?

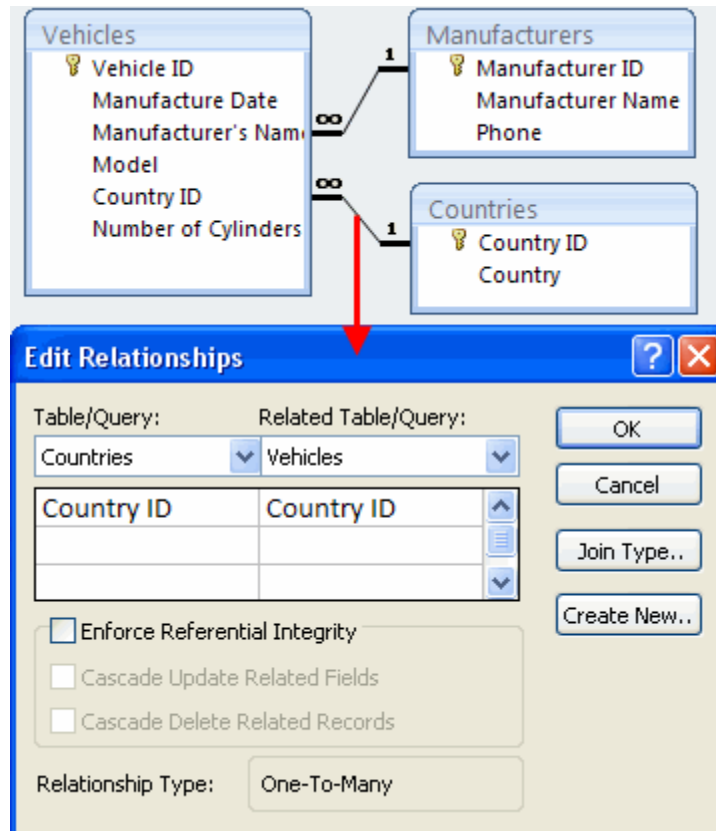
Referential Integrity is a set of rules and conditions that makes data entry into databases safer. You should try to enforce referential integrity whenever possible. It insures that all related fields are valid when considered together in a database, and prevents you from accidentally deleting related data. To make referential integrity work, the following three conditions must be satisfied:

- The matching field from the parent table is a primary key or has a unique index
- The fields in the relationship have the same data type
- Both tables are stored in the same database file

When these three conditions are satisfied, then you will be able to fully establish referential integrity.

Enforcing Referential Integrity

To enforce referential integrity, you must first create a relationship or modify an existing relationship. The easiest way to create one is to drag and drop one field from one table onto another in Relationships view. If editing an existing relationship, right-click on the join line and click Edit Relationship. Either method will show the Edit Relationships dialogue box.



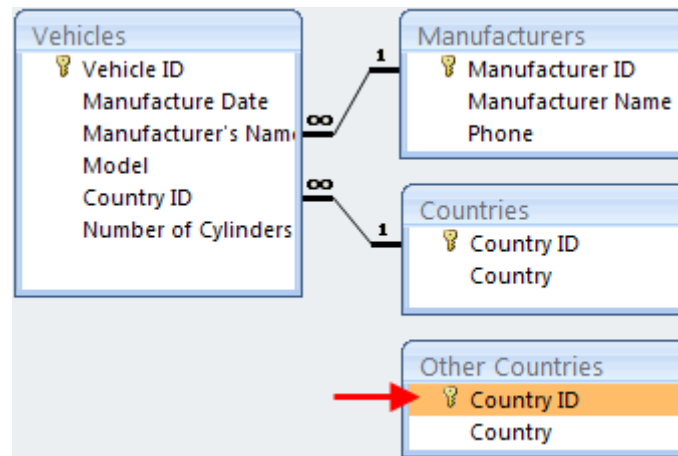
Access has determined that the type of relationship is One-to-Many and states which field or fields were considered in the relationship. To establish integrity, click the Enforce Referential Integrity check box.

Doing so will make the two check boxes beneath it active. Cascade Update Related Fields will make any change in the parent table filter down through all related child tables. (For example, if you change your address, your main bank account will change and subsequently all other related financial documents will also be changed.) Similarly, Cascade Delete Related Fields will remove all instances of a particular record from the parent table down through the rest of the related tables.

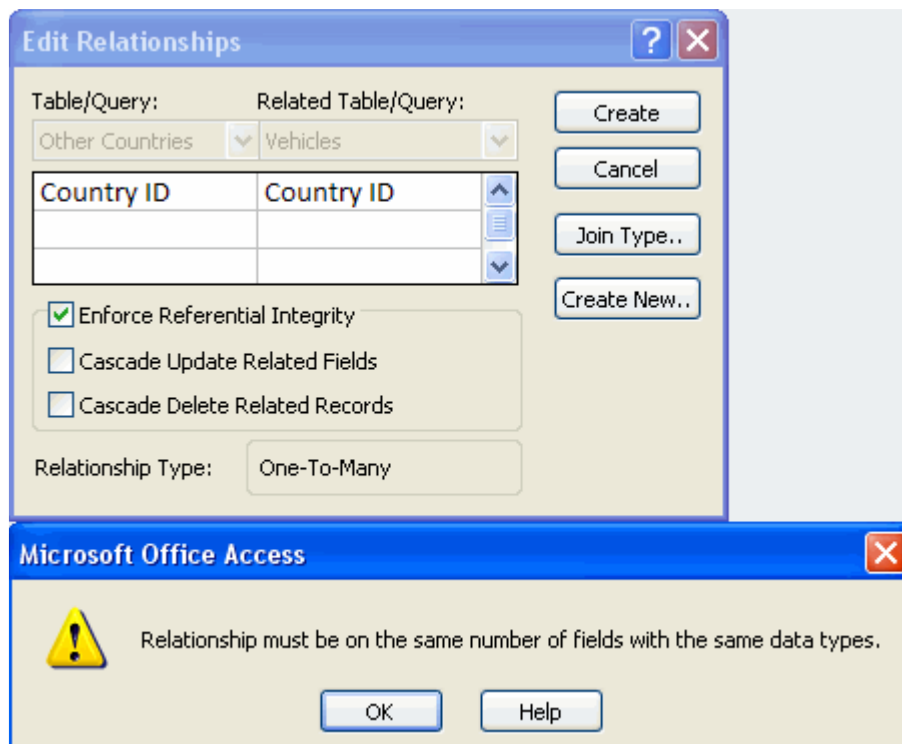
Testing Referential Integrity

Due to the nature of referential integrity, much of the testing you can do for referential integrity is inherently built into the tables before referential integrity can even be established! Let's demonstrate by trying to create a relationship with a table that does not meet the requirements of referential integrity.

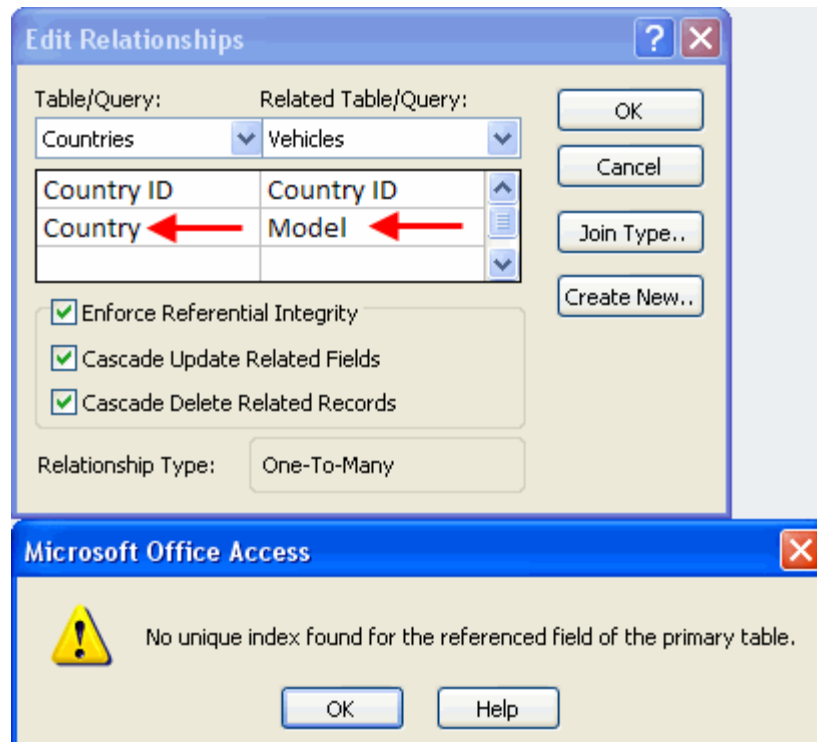
In the diagram below, the Other Countries table contains the same field names as the Countries table. However, the Country ID in the new table is a Text data type, not AutoNumber:



If Country ID is dragged and dropped onto the Country ID field of the Vehicles table, the same relationship window will appear. You can still check off that you wish to apply referential integrity to the relationship, however if you click Create you will encounter an error message:



Now imagine you want to try and create another relationship. If you try to create a relationship between two seemingly unrelated fields (such as Countries.Country and Vehicles.Model), you need to first fill in which fields you want considered in the relationship:



However, clicking OK will not establish the relationship between Countries.Country and Vehicles.Model because no common fields exist between these two particular fields, despite being the same data type.

Referential integrity is only one way to help keep your data safe from incorrect values. Other features built into Access also provide defense against improper data entry including adding validation rules, default values, and choosing the correct data type. All of the various methods of protection, when used together correctly, will result in a very stable database.

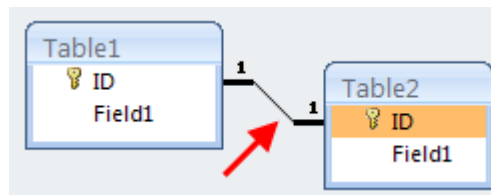
Lesson 1.2: Table Relationships

In this lesson we will expand upon the principles taught in the previous lesson and we will discover a little bit more about the nature of relationships.

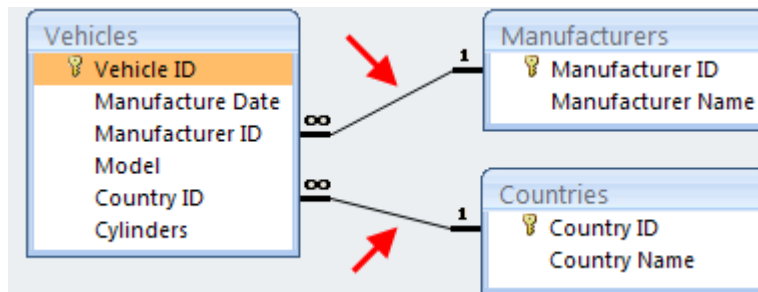
About Join Lines

In Relationships view, Access provides a graphical view of the data contained in a database. Visualization of data in this way can really help a user understand what is going on. The join lines represent a relationship between one field in a table and another.

Depending on the nature of a relationship, you will see small symbols above each end of a join line to show what role each table of data plays in regards to the other. For example, a One-to-One relationship in Access will appear as the following:



In the last Step-By-Step exercise, you established two One-to-Many relationships:



The number 1 and the infinity sign on each end of the above relationships symbolizes that one field in one table may relate to many fields in another table.

Normalizing Tables

Database design can sometimes seem like a daunting task. But as with most things in life, even the most complicated procedure can be broken down into a number of simple steps. So too is the nature of databases. Once you have a good idea of what your database is to contain, you can begin to apply a level of normalization to the database.

Database normalization is essentially a sequence of steps that breaks a large and complicated database into smaller pieces. Doing so prevents large holes in the data and helps eliminate the possibility of errors. Following the normalization rules also makes updating and modifying the database much easier. For example, picture a desktop PC as a single entity. Now think of the individual pieces. You have a PC, a monitor, a keyboard, mouse, printer, power bar, and cables connecting it all together. If your mouse breaks and you want to have it repaired, you wouldn't bring the entire PC as assembled to a repair shop; you would simply detach the mouse to have it fixed. The same principle is true with database normalization. It would be impractical to have every bit of information in one massive table; instead, break the table down into many smaller tables, each containing information relevant directly to itself.

Databases can be molded into five different 'normal forms,' each form more specific than the last. Let's quickly explore the first three levels of normalization. The vast majority of databases you will use in Access will reach the level of Third Normal Form but likely not any higher.

First Normal Form

First Normal Form (1NF) states that every item in a table must be only a single item. For example, consider the following questions:

- "What is your favorite color?"
- "What foods don't you like to eat?"

The first question has only one answer, while the second can have many answers. A database in 1NF will contain a table like the following:

Name	Color
Alice	Red
Bob	Green
Carl	Blue

This table, however, is not in 1NF:

Name	Won't Eat
Alice	Chinese food, Brussels sprouts
Bob	Eggs, hamburgers, lentils
Carl	Fish, tomatoes

Second Normal Form

Second Normal Form (2NF) states that a table must be in 1NF, and that every field in a record that is not the primary key is dependant on a primary key. Access 2007 tries to create all tables in 2NF by adding an ID field with an AutoNumber data type to every table. The majority of databases for small and medium applications will be in 2NF.

Third Normal Form

Third Normal Form (3NF) states that all non-primary key fields must be mutually independent; that is, every non-primary key field should be either the primary key of some other table or unique in its table. Consider the following table design in 2NF:

Product ID (primary key)
Supplier Name
Supplier Address

The Supplier Name and Supplier Address do not belong in the table if the database is to be in 3NF. The current 2NF means that there will likely be much repeated data if a single supplier sells many products. Therefore, a second table will be created with the following attributes:

Supplier ID (primary key)
Supplier Name
Supplier Address

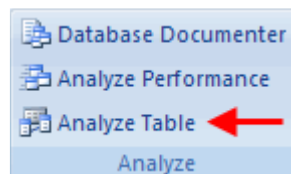
The above table design contains all unique data. Therefore, the first table would become:

Product ID (primary key)
Supplier ID (foreign key)

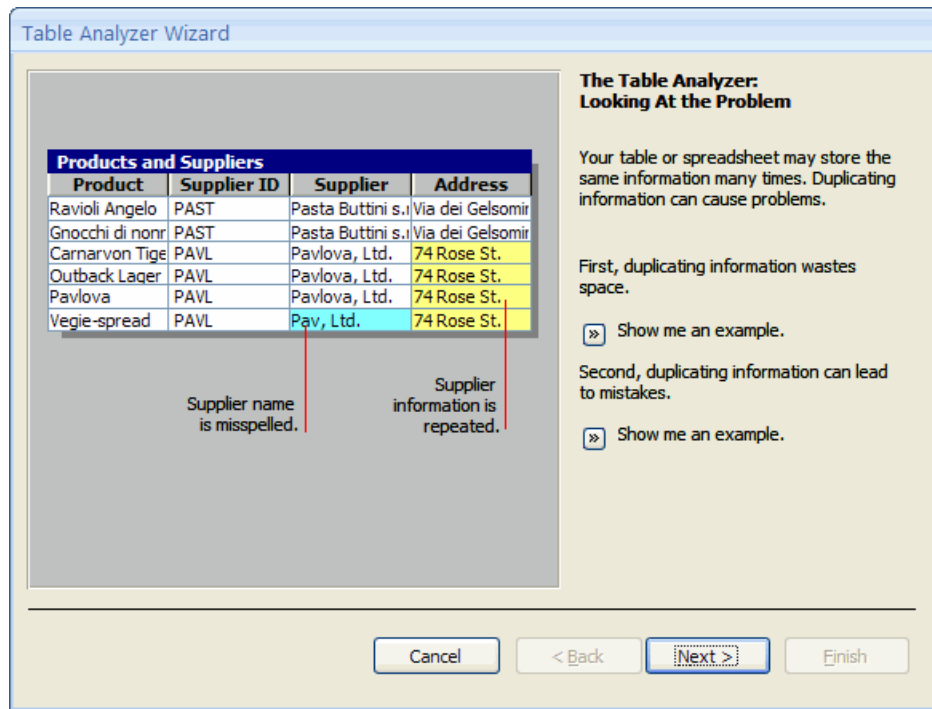
Access 2007 features a built-in database performance tool that helps you analyze data in a table. This functionality will help you find the best design of table to suit your needs. Consider the following table, already in 2NF:

Supplies			
Supply ID	Cleaning Supply	Supplier Name	Supplier Address
1	Broom	Acme Cleaning	123 Acme Way
2	Dust Pan	Acme Cleaning	123 Acme Way
3	Mop	Acme Cleaning	123 Acme Way
4	Rag	Shiney and Tidy	44 Clean St.
5	Sponge	Shiney and Tidy	44 Clean St.
* (New)			

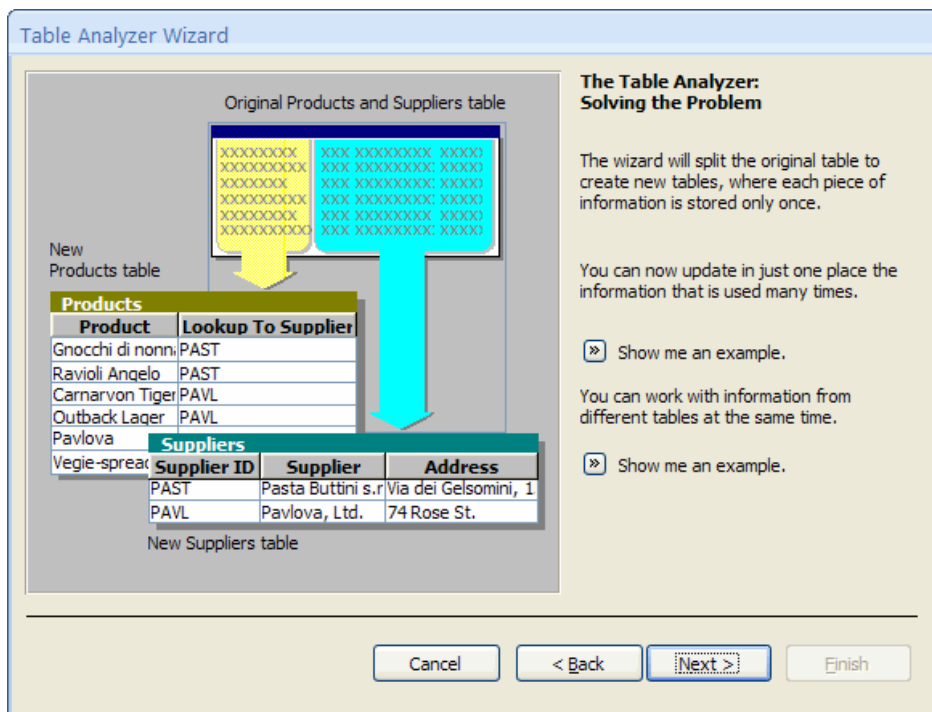
This is not the best design because this table contains a lot of data that is not necessary and repetitive; for example, we can see that the Supplier Name and Address are repeated for each supply made by the same company. Although not necessary, close the table you want to analyze if it is open. This prevents the Wizard from taking extra steps to while renaming certain tables. Click the Analyze Table command in the Analyze section of the Database Tools ribbon:



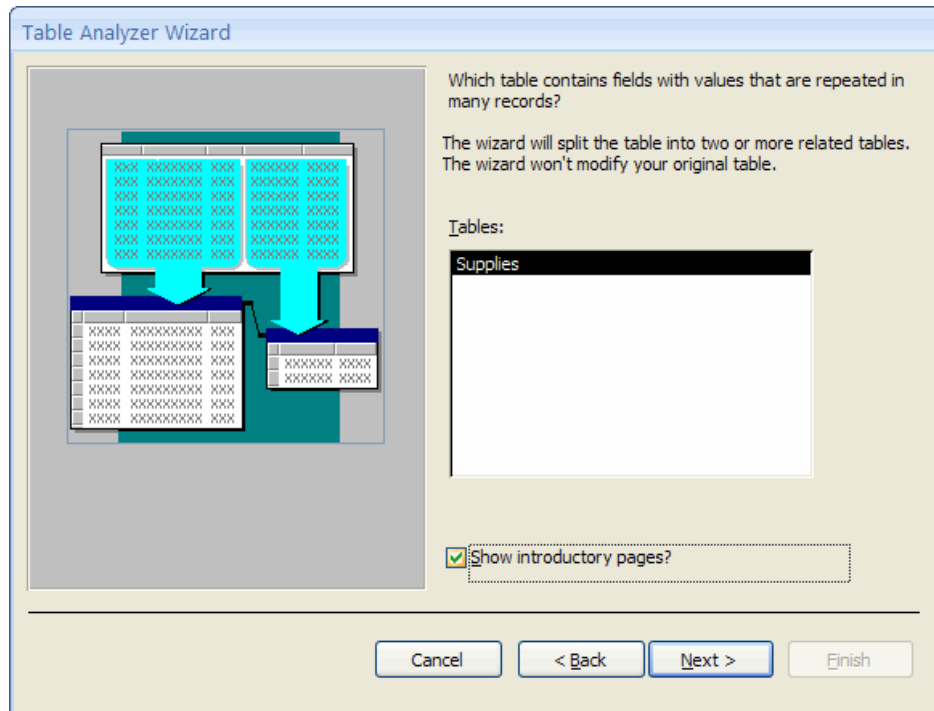
This will launch the Table Analyzer Wizard:



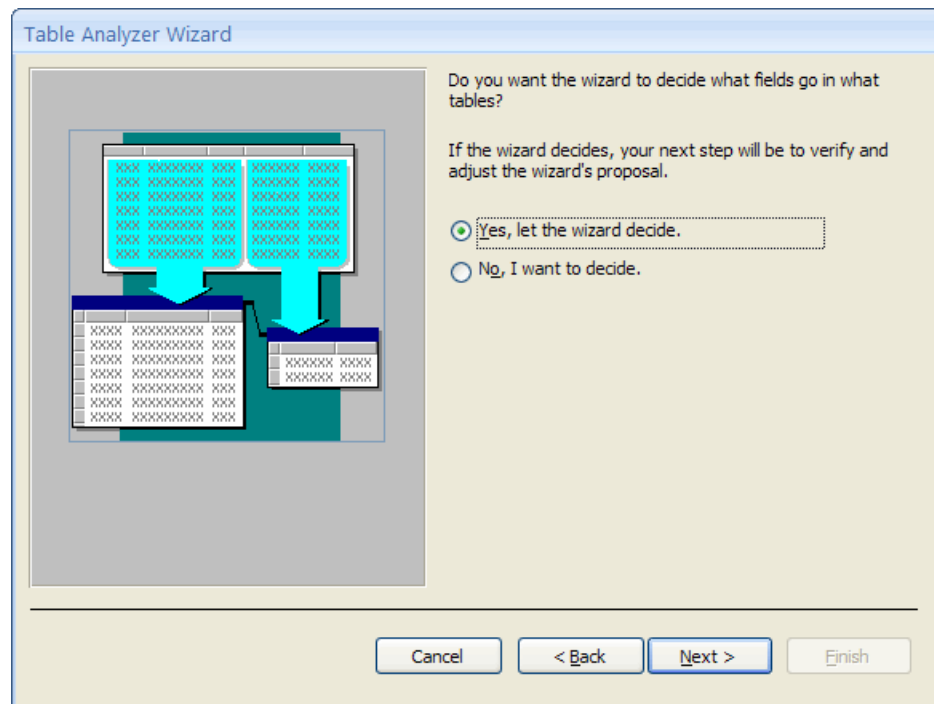
The first two pages of the Wizard go through some of the common errors associated with databases and how it can fix them:



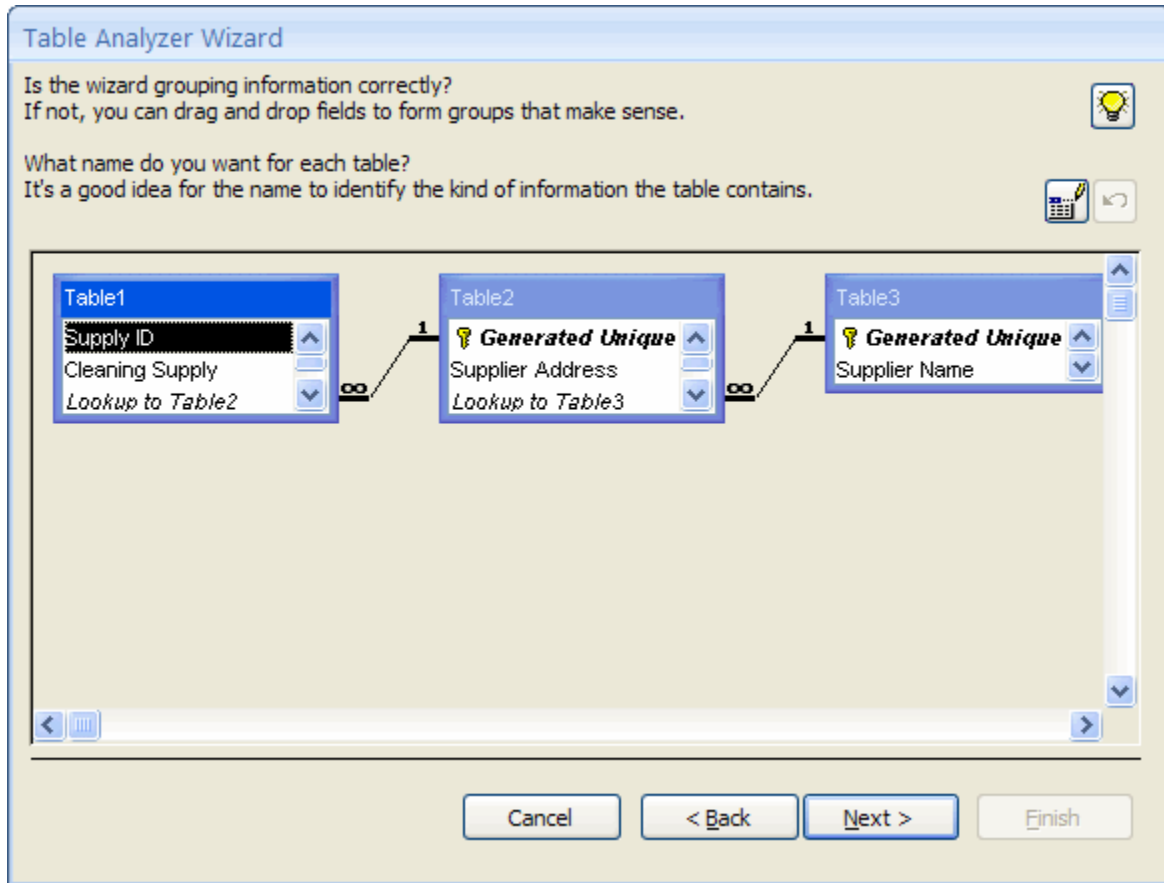
The next page of the Wizard asks you to choose which table in your database contains possible duplicate values. Choose the table to analyze and click Next:



In the next step, you can choose to let the Wizard perform its analyses on your table and make recommendations on how it thinks you should modify the changes:

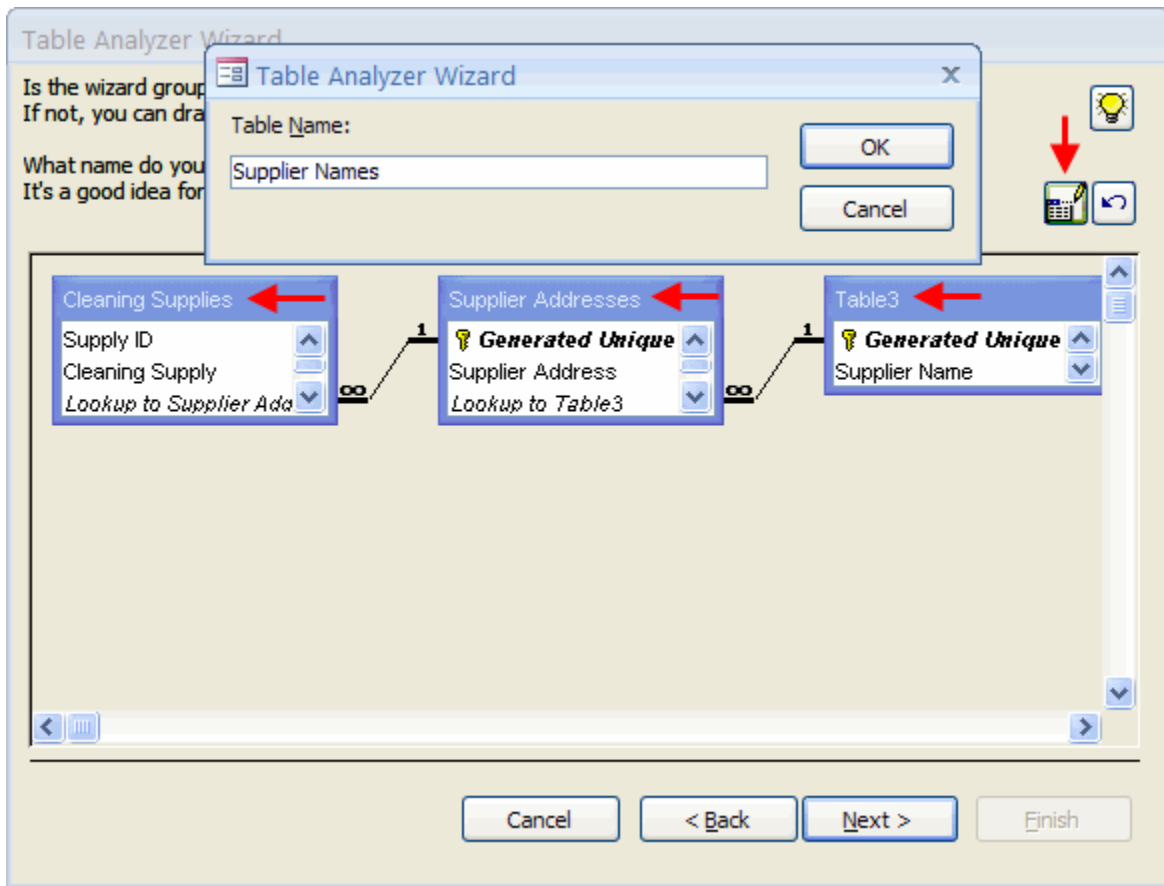


The Wizard will analyze what it feels will be the best way to divide the Supplies table.



By examining this layout, we can see that the Wizard has successfully divided the table to meet 3NF. Each cleaning supply has an ID and a name, as well as a lookup field that references the next table. The next table contains a unique primary key, the address field, and a lookup field to the final table. The final table contains a unique primary key and the Supplier name. It may seem like an extra step to include the third table; however, the Wizard thought it possible that a number of companies might reside at the same address (such as many companies working from the same office building). Therefore, each address was given priority over the company name.

Click the title bar of a table and then click the Rename Table icon () to give it a new name:







The next step allows you to further customize how Access will use the primary keys generated by this Wizard:

Table Analyzer Wizard

Do the bold fields uniquely identify each record in the proposed table?


The primary key field(s) must have a different value in every record of the proposed table.
If no field has unique values, the wizard can add a Generated Unique ID field for you.


Cleaning Supplies

- Supply ID
- Cleaning Supply
- Lookup to Supplier Address




Supplier Addresses

-  **Generated Unique**
- Supplier Address
- Lookup to Supplier Name

Supplier Names

-  **Generated Unique**
- Supplier Name


Relationships: Cleaning Supplies (1) to Supplier Addresses (∞), Supplier Addresses (1) to Supplier Names (∞)

Cancel < Back Next > Finish

The final step of the Wizard can create a query for you that will select all of the fields from all of the newly created tables.

Table Analyzer Wizard



That's all the information the wizard needs to create related tables.

After the wizard creates new tables, it can create a query that looks like your original table but does much more.

If you choose to create a query:

- Forms and reports based on your original table will continue to work.
- The wizard will give the query the name of your original table, and rename your original table.

Do you want a query?

☒ Yes, create the query.

☐ No, don't create the query.

☒ Display Help on working with the new tables or query?

Cancel < Back Next > Finish

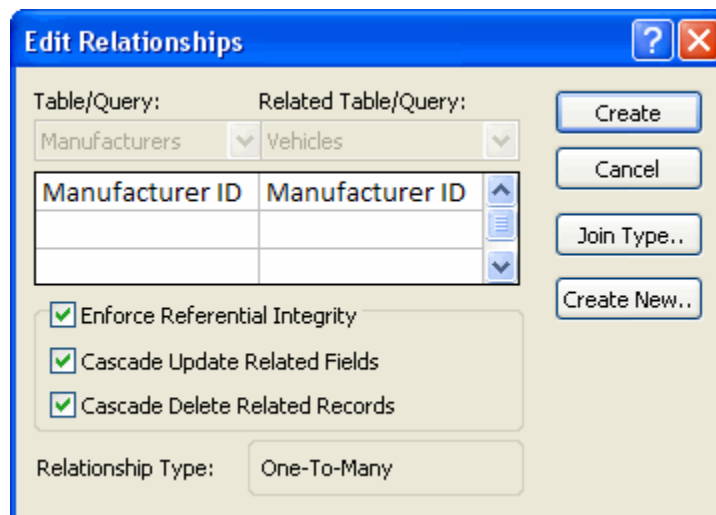
It will also rename the old (analyzed) table as tablename_OLD.

All Tables				
Supplies_OLD	Supplies	Supply ID	Cleaning Supply	Lookup to Supplier Names
Supplies_OLD : Table		1	Broom	Acme Cleaning
Cleaning Supplies		2	Dust Pan	Acme Cleaning
Cleaning Supplies : Table		3	Mop	Acme Cleaning
Supplies		4	Rag	Shiney and Tidy
Supplier Addresses		5	Sponge	Shiney and Tidy
Supplier Addresses : Table		*	(New)	
Supplies				
Supplier Names				
Supplier Names : Table				
Supplies				

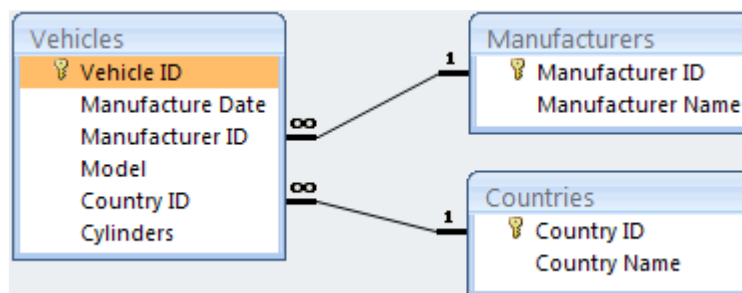
Using Cascade Delete and Cascade Update

In the previous section we learned that when two tables follow the rules of referential integrity, the whole design of the database becomes a more solid unit. It actually becomes a challenge to enter 'bad' data into the database!

When a relationship is established, you will see the Edit Relationship dialogue appear. Beneath the check box to Enforce Referential Integrity, you will see two more checkboxes marked as Cascade Update Related Fields and Cascade Delete Related Fields:

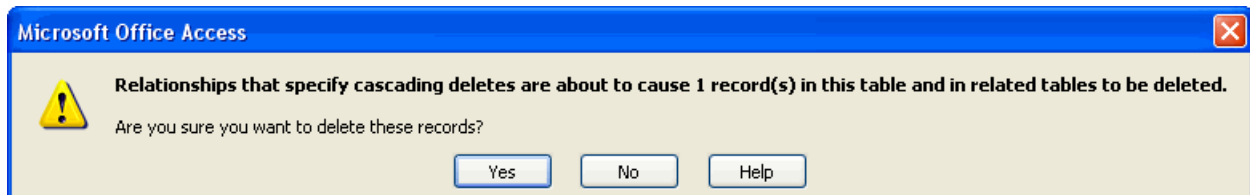


Should anything happen to data on the 'one' side of a One-to-Many relationship, the changes will thusly be filtered down through the rest of the relationship hierarchy. Consider the Vehicles database for earlier in this section:



Both of the relationships shown here have had referential integrity enforced, as well as the options to cascade the update and delete enabled. If we were to remove one of the Manufacturers from the Manufacturers table, any vehicles associated with that particular Manufacturer ID would be removed from the table. Consider the removal of the Manufacturer Ford, which contains two vehicles in the Vehicles table.

If you delete a record from a table which follows the cascade rules, you will see the following warning:

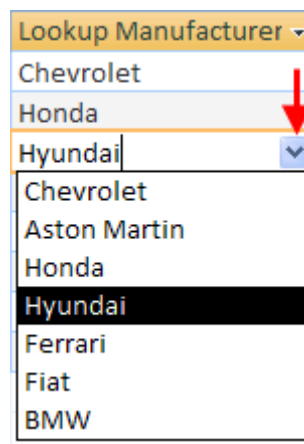


Clicking Yes will remove the record(s) from the current table as well as a number of other records in the 'many' table in the One-to-Many relationship:

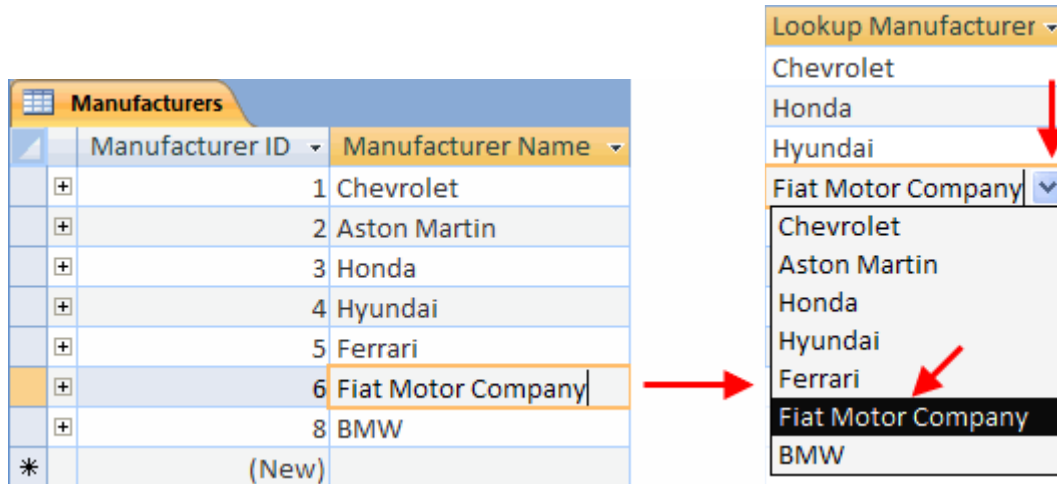
Vehicles			
Vehicle ID	Manufacture Date	Manufacturer ID	Model
1	1982	1	Corvette
2	2000	3	S2000
3	2003	4	Tiburon
4	1979	6	Spyder
7	1998	8	328i
8	1957	8	Isetta
9	2003	5	575 Marinello
*(New)			

Notice in the diagram above that the records with the Vehicle IDs 5 and 6 have been removed. The nature of the AutoNumber data type (the data type used by Access for the ID) will not re-use those numbers again in this table. Any new vehicles will be listed as 10, 11, etc.

Cascading updates work in the same manner, except that records are modified instead of being removed. This is best shown by example. First, let's place a lookup field on the Manufacturer ID so that the data shown in the table is more meaningful than simply a number:



Now imagine that a Manufacturer changes their name and you want to apply the change through your entire database. Because cascading updates were enabled in this database relationship, we can easily change the name of one Manufacturer and have the name change reflected throughout all related tables in the database:



Setting Fields for Indexing

An index is designed to help speed up a search. When you look up something in an encyclopedia, and the subject starts with the letter Q, you are not going to start looking at A in the index and browse until you reach Q! You will start at Q because you know the value is not in any of the sixteen previous letters. The same principle applies to a database. To index a field, open a table in Design view:

Field Name	Data Type	Description
Vehicle ID	AutoNumber	
Manufacture Date	Number	
Lookup Manufacturer Name	Number	
Model	Text	
Country ID	Number	
Cylinders	Number	

Field Properties	
General	
Field Size	255
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	No
IME Mode	Yes (Duplicates OK)
IME Sentence Mode	Yes (No Duplicates)
Smart Tags	

An index speeds up searches and sorting on the field, but may slow updates. Selecting "Yes - No Duplicates" prohibits duplicate values in the field. Press F1 for help on indexed fields.

The Model field in the diagram above is an ordinary text field and is not index by default. There are three options when indexing:

- No** No indexing will be performed on this field
- Yes (Duplicates OK)** The database will allow for multiple rows that have the same field value.
- Yes (No Duplicates)** The opposite of the above feature; if you have several rows with the same make, only the first row instance will be indexed.

Primary keys are always indexed with no duplicates. The only data types you can't index are Memos and Hyperlinks.

Using the Index

When talking about indexes in general, there is no specific command that uses an index. Their use happens in the background of the database. However, creating indexes can sometimes be a tricky situation. In this final part of this lesson, we will discuss when (and when not) to use indexes.

As stated before, primary keys are always indexed. If a database has been established in 3NF, you may wish to put an index on the foreign key(s) in a table. In the case of our Vehicles database, you may actually want to place an index on the Model field, as listed in the combo box of the diagram above. You would select the Yes (Duplicates OK) option because several manufacturers may name their vehicles the same thing.

Setting a field to Yes (Duplicates OK) will allow for several rows to have the same field data. If you have several rows that have the same model name, and have several different models in your database, this option makes database updates slower yet makes searches faster (in the case of very large databases, containing millions of records).

Setting a field to Yes (No Duplicates) works the opposite of above. Database updates become faster but search time for queries will increase (in the case of very large databases).

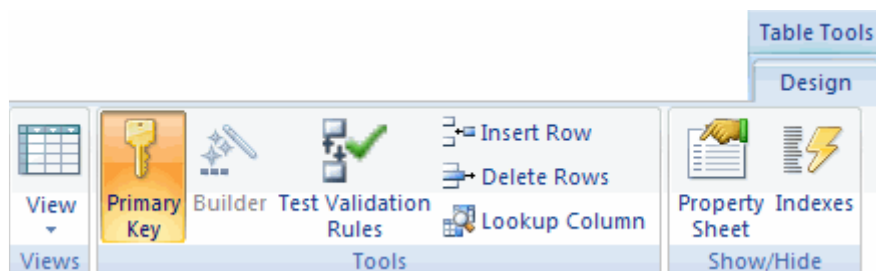
Setting only a single index on a huge table and setting ten indexes on many small tables may end up having the same performance gains/losses. When and where you should index a database is something that will come to you with time and experimentation.

SECTION 2: Working with Related Tables

In this section, we will explore some more advanced table data entry techniques. These methods, combined with all of the controls that can be enforced from previous sections, help protect your database from bad data entry.

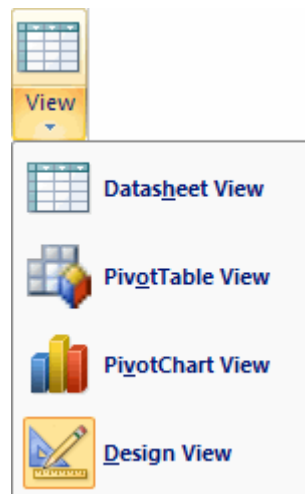
Using the Table Design Ribbon

Access 2007 features a special contextual tab that deals with Table Design:



Views

This command switches back and forth between the different views of a table:



Primary Key

This command toggles the primary key property for a field on and off. Although relatively rare, it is possible for a table to have more than one primary key.

Builder

Use this command to activate the expression builder. The expression builder is used to create logical expressions used to help ensure data is properly entered into a table. We will explore the

use of this command in this lesson.

Test Validation Rules

This command will check any logical expressions built with the expression builder as well as other properties of a table to ensure there are no inconsistencies.

Insert Row

Use this command to insert a new field above the currently selected row in Design view.

Delete Rows

This will remove the currently selected field from Design view.

Lookup Column

A lookup column is a special type of combo box used to enter data into a table. You can fill the lookup column with your own data, or use data from another table. Lookup columns are very useful in using information contained in a different table. We will explore lookup columns in this lesson.

Property Sheet

In addition to having field properties, each field has another set of properties you can modify that deal with more advanced properties. Though some are duplicates of the field properties, most of these properties are beyond the scope of this manual.

Indexes

This command is used to modify the background properties of an index you can apply to a field.

Creating a Lookup Field

The current Vehicles table has been populated with some information. We already established the relationships with the Countries and Manufacturers tables. However, having a Manufacturer ID of 6 and a Country ID of 3 is not very meaningful when looking just at the Vehicles Table:

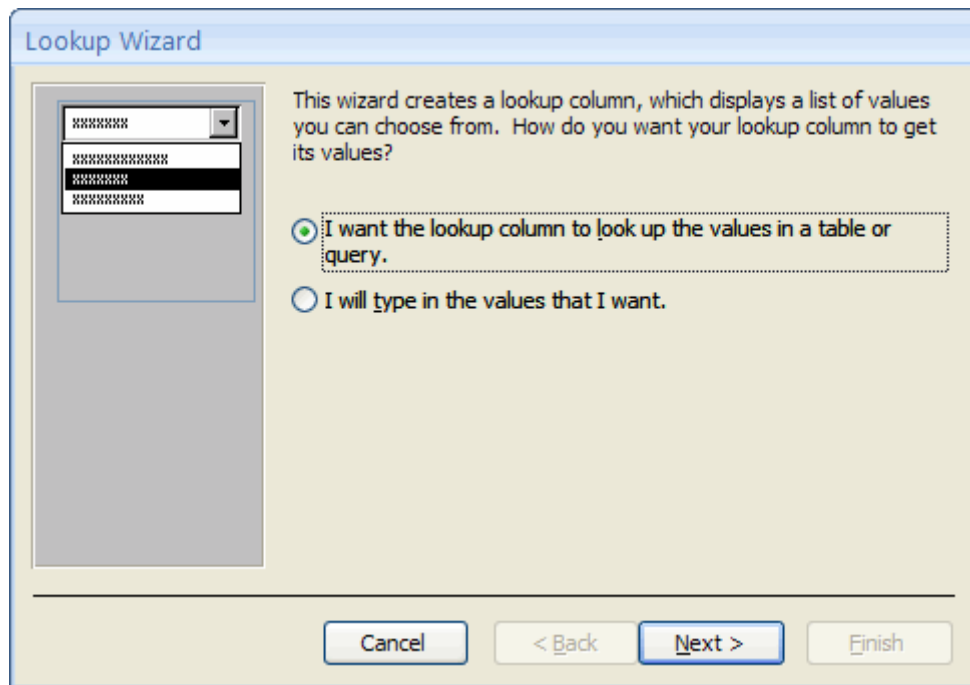
Vehicles						
Vehicle ID #	Manufacture Date	Manufacturer ID	Model	Country ID	Cylinders	
1	1982	1	Corvette	1	8	
2	2003	2	V12 Vanquish	2	12	
3	2000	3	S2000	4	4	
4	2003	4	Tiburon	5	4	
5	2002	5	575 Marinello	3	12	
6	1979	6	Spider	3	4	
7	1965	7	Falcon	1	8	

Fortunately, Access features something called a lookup field. It allows you to use the actual Manufacturer name and Country name to enter data in the field. Creating a lookup field is easy; however you must first delete the relationship(s) that exist in the field.

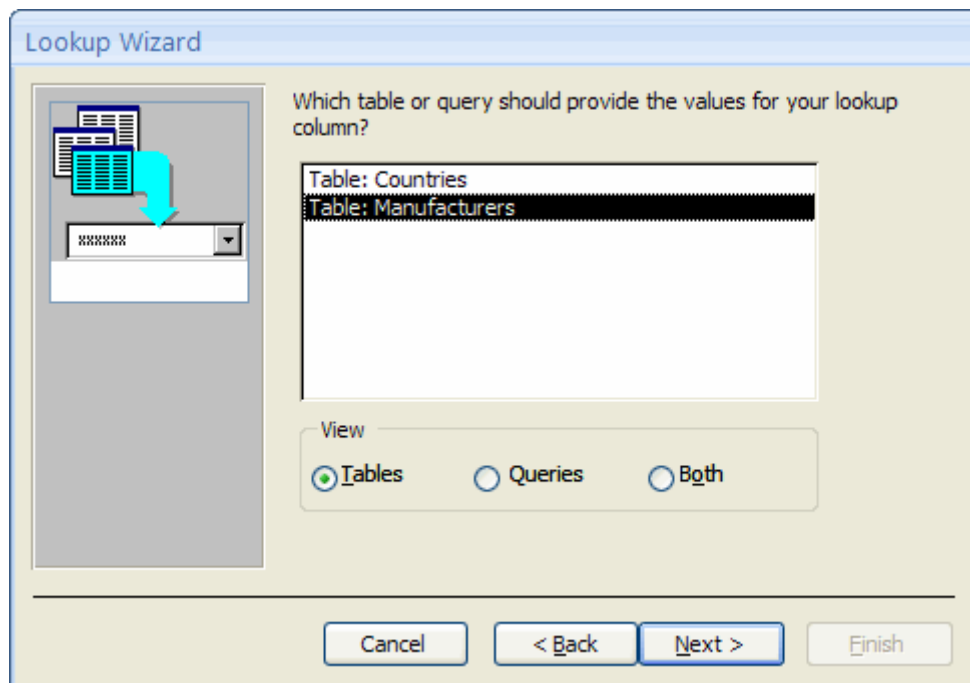
First, open the Vehicles table in Design view. Click in the Data Type cell of the field you want to turn into a lookup table and click Lookup Wizard.

Vehicles		
Field Name	Data Type	Description
Vehicle ID	AutoNumber	Identification number for each vehicle in this table.
Manufacture Date	Number	First year of Production.
Manufacturer ID	Number	Manufacturer of vehicle.
Model	Text	Model name of vehicle.
Country ID	Memo	Manufacturer's base of operations.
Number of Cylinders	Number	Number of Cylinders in Engine Block, 0 for rotary engines.
	Date/Time	
	Currency	
	AutoNumber	
	Yes/No	
	OLE Object	
	Hyperlink	
	Attachment	
	Lookup Wizard...	

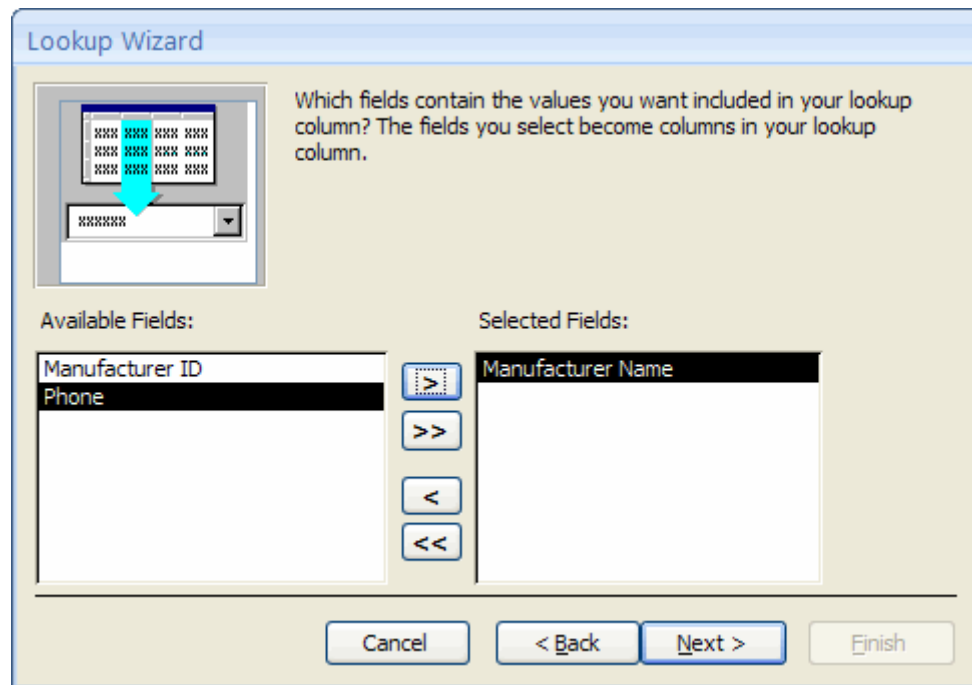
The Lookup Wizard will appear. In the first step, select the data source you will use for your lookup field. In our case, we want to use the data contained in the Manufacturers table:



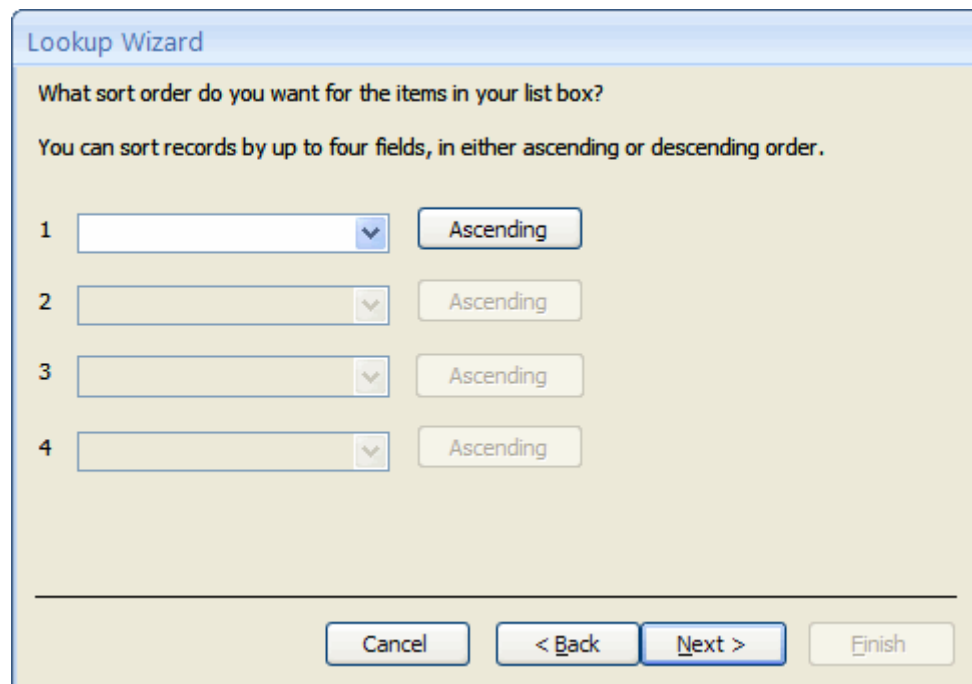
The next step allows you to choose which table (or query) contains the lookup values; in our case the Manufacturers table:



The next step lets you choose which field or fields in the source table you want to use for your lookup field. In our case, we want to show the Manufacturer name instead of just the ID:



In the next step you have the option to sort the values that will appear in the field in ascending or descending order. If you do not specify anything in this step, Access will automatically apply an ascending order on the field that was used to create the filter:



The next step allows you to move your mouse to the edges of the column and click and drag to adjust the size. You can also opt to show the primary key column, which will show the corresponding primary key for each value in the lookup field:

Lookup Wizard

How wide would you like the columns in your lookup column?

To adjust the width of a column, drag its right edge to the width you want, or double-click the right edge of the column heading to get the best fit.

☐ Hide key column (recommended)

Manufacturer ID	Manufacturer Name			
1	Chevrolet			
2	Aston Martin			
3	Honda			
4	Hyundai			
5	Ferrari			
6	Fiat			
7	Ford			

Cancel < Back Next > Finish

The final step of the Wizard will give the lookup field a name. This will replace the column name of Manufacturer ID. Click Finish:

Lookup Wizard

What label would you like for your lookup column?

Manufacture's Name

Those are all the answers the wizard needs to create your lookup column.

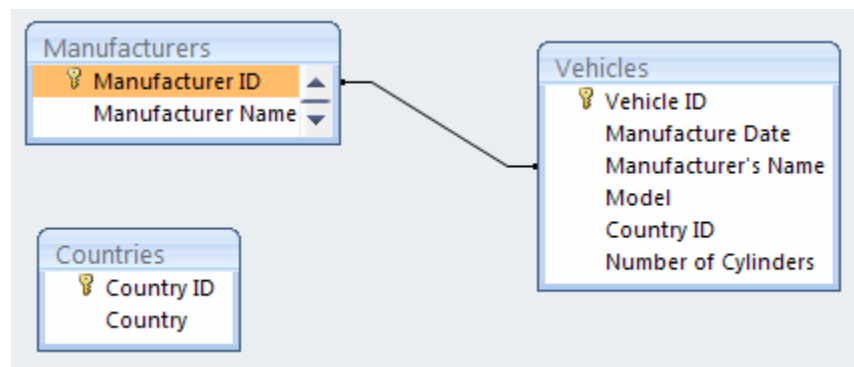
☐ Display Help on customizing the lookup column.

Cancel < Back Next > Finish

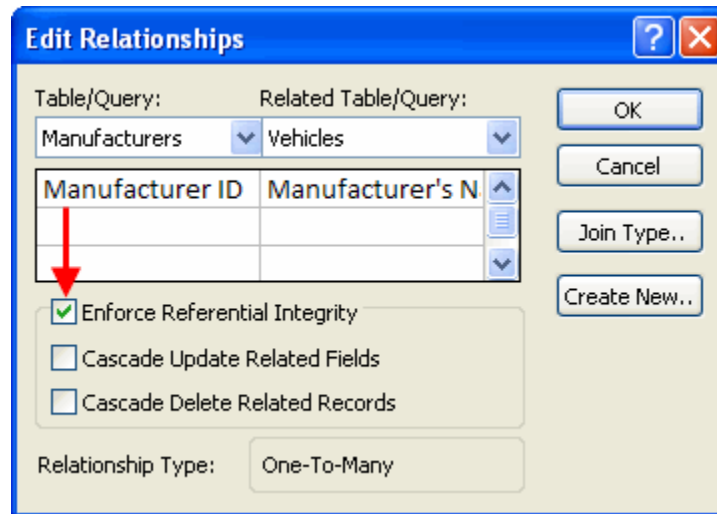
Return to Datasheet view once the Wizard completes. If you click in the Manufacturer's Name column of data, the field becomes a combo box. If you need to change the value to something else, click the pull-down arrow to see a list of available values:

Vehicles						
Vehicle ID #	Manufacture Date	Manufacturer's N	Model	Country ID	Cylinders	Add New Field
1	1982	Chevrolet	Corvette	1	8	
2	2003	Aston Martin	V12 Vanquish	2	12	
3	2000	Honda	S2000	4	4	
4	2003	Hyundai	Tiburon	5	4	
5	2002	Chevrolet	575 Marinello	3	12	
6	1979	Aston Martin	Spider	3	4	
7	1965	Honda	Falcon	1	8	
*	(New)	Hyundai			6	
		Ferrari				
		Fiat				
		Ford				

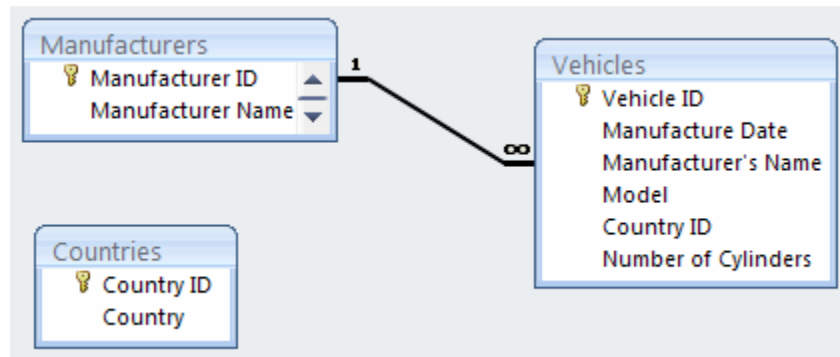
As part of the lookup field creation process, Access created a basic relationship between the Vehicles and Manufacturers table:



However, the relationship is not a strong one. Right-click the black line joining the two tables and click Edit Relationships:

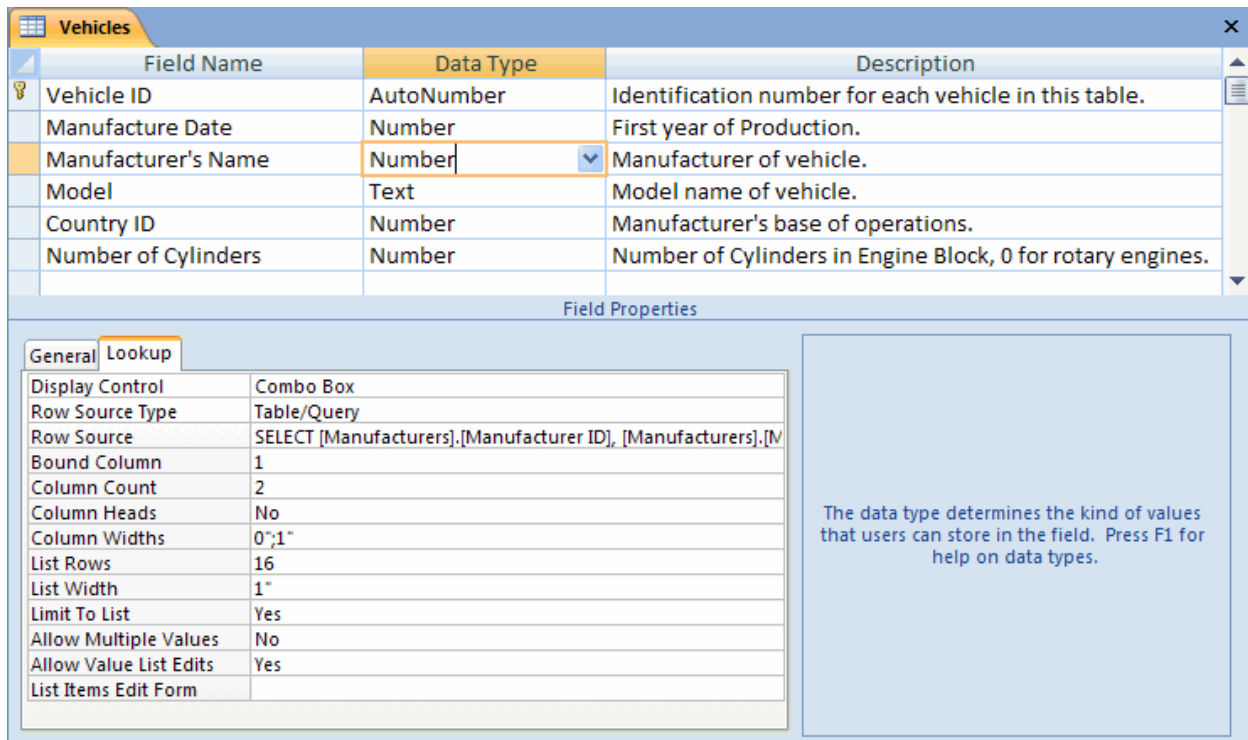


Click the Enforce Referential Integrity check box and click OK. The full relationship will be restored:



Modifying a Lookup Field

Now that you know how to establish a lookup field, you can modify certain characteristics of the field to suit your database's needs. If you open a table in Design view, you can view the lookup field properties by clicking the Lookup tab at the bottom of the window:



The following properties are available to adjust:

- Display Control** You can choose between a Text Box, List Box, or Combo box for the lookup field.
- Row Source Type** You can specify between Table/Query, Value List, or Field List.
- Row Source** The query or data that the lookup field uses.
- Bound Column** Lists how many columns that currently constitute the lookup field.
- Column Count** Number of columns that are available to use as a lookup field.
- Column Heads** Can specify Yes/No if a field label, caption, or first row of data used to construct the lookup field values will be used.
- Column Widths** Lists the dimensions of the columns used in the lookup field. The

number of columns in the Column Count field are the same number of dimensions listed here.

List Rows

Maximum number of rows that are displayed if combo box is the specified Display Control.

List Width

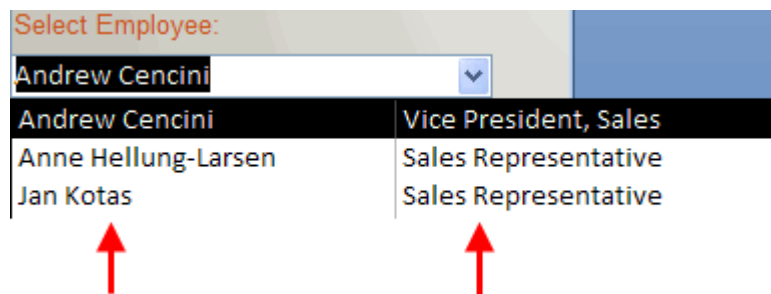
Width of the combo box if specified as Display Control.

Limit to List

Forces user to use only the values in the lookup field; that is they cannot enter any data not specified by the query.

Allow Multiple Values

Access 2007 allows you to view multiple items in the lookup column at once, just like the login screen for the Northwind sample database:



Allow Value List Edits

Lets you edit the values that are contained in the lookup column.

List Items Edit Form

If the above property is set to Yes, specify which form you wish to use in order to modify the lookup values.

Creating a Value List

We have seen in the last section of this lesson that you can use a table to retrieve lookup field values. However, Access gives you the ability to specify the values that can be used in a lookup field yourself.

In this example, we will help prevent improper data from being entered into the Number of Cylinders field of the Vehicles table. We will create a value list that will let a user pick how many cylinders a car has from a list of options. To create this value list, open the Vehicles table and enter Design view.

In the Data Type field of Number of Cylinders, select Lookup Wizard.

Vehicles			
	Field Name	Data Type	Description
	Vehicle ID	AutoNumber	Identification number for each vehicle in this table.
	Manufacture Date	Number	First year of Production.
	Manufacturer ID	Number	Manufacturer of vehicle.
	Model	Text	Model name of vehicle.
	Country ID	Memo	Manufacturer's base of operations.
	Number of Cylinders	Number	Number of Cylinders in Engine Block, 0 for rotary engines.
		Date/Time	
		Currency	
		AutoNumber	
		Yes/No	
		OLE Object	
		Hyperlink	
		Attachment	
		Lookup Wizard...	

The Lookup Wizard window will appear. Select the second radio button and click Next:

☐ I want the lookup column to look up the values in a table or query.

☒ I will type in the values that I want.

The next page of the Wizard is where you enter the values you want to use for the value list.

Lookup Wizard

What values do you want to see in your lookup column? Enter the number of columns you want in the list, and then type the values you want in each cell.

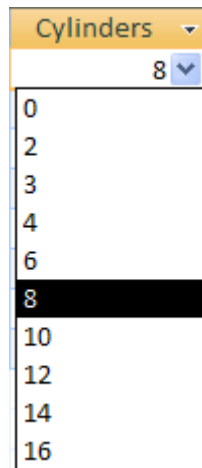
To adjust the width of a column, drag its right edge to the width you want, or double-click the right edge of the column heading to get the best fit.

Number of columns:

Col1
0
2
3
4
6
8
10

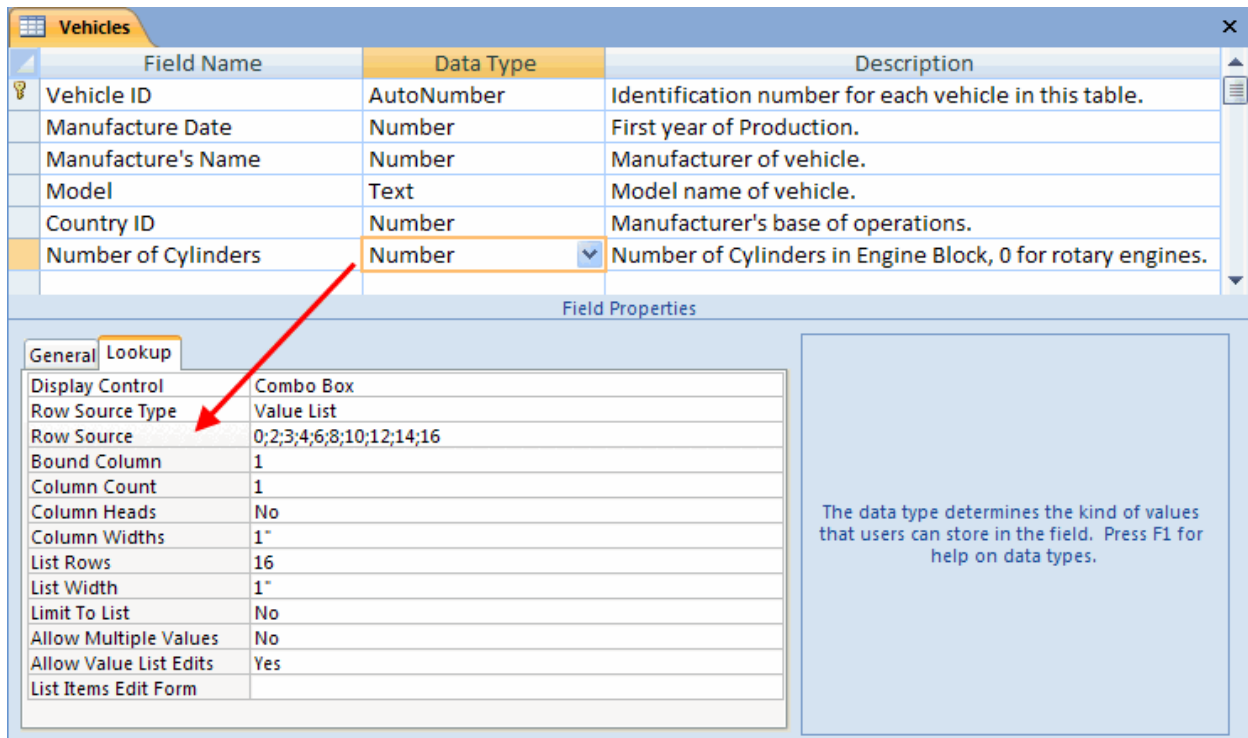
In this page of the Wizard you can specify the number of columns for the value list and which values you want to include in the list. (The majority of lookup fields/value lists you will use will only be a single field at a time.) Click your mouse inside the first cell, type a value, and press Tab on your keyboard to move to the next cell. When you have entered the list of values you want to use, click Next.

The final step of the Wizard asks you to name the lookup column (value list). The default name is the same name as the field, but you can name it whatever you like. Click Finish to complete the Wizard. If you open Datasheet view for the table you will be able to use the combo box to fill in a value for the field.



Modifying a Value List

Modifying the properties of a value list is essentially the same as those for a lookup field. Click the Lookup tab located at the bottom of Design view:



The only difference between this value list and any lookup field is the ability to see and modify all of the values currently assigned in the Row Source field. You can add or delete as many as you like, but make sure that each value is separated by the delimiting semicolon.

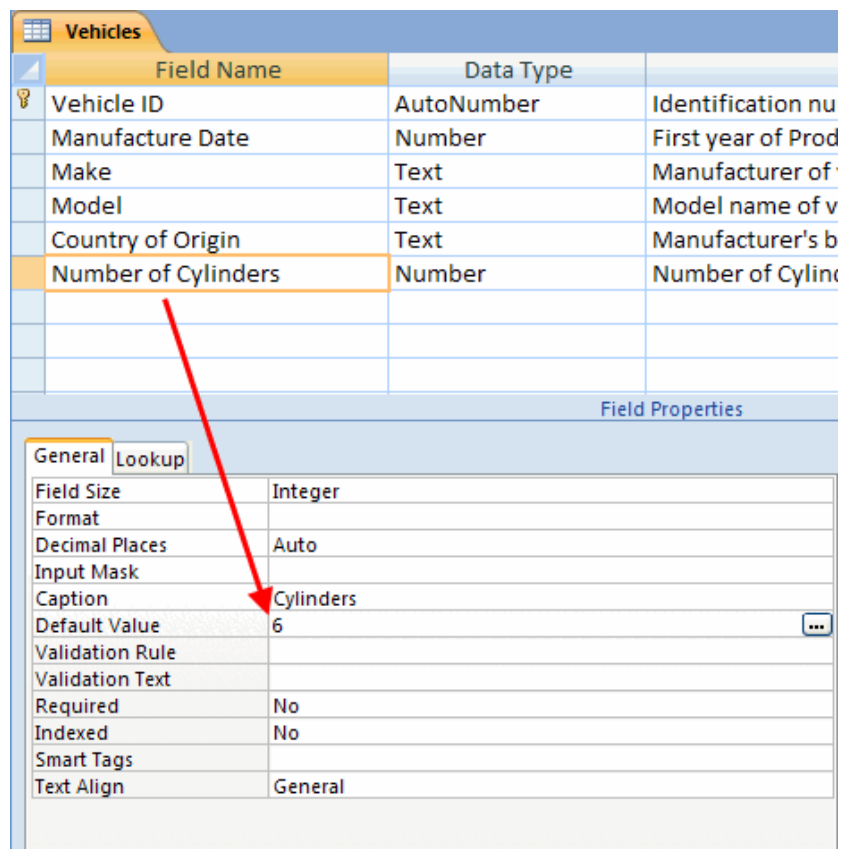
SECTION 3: Defining Data Entry Rules

We will continue our examination of tables in this lesson by learning how to make table entry even more precise, further eliminating the risk of having bad or incorrect data entered into the database.

Setting a Default Value

A default value is something that is always present in a particular field whenever a new record is made. For example, if you own a company with its base of operations in New York, you can assign a default value of 'New York' in all of the address fields you might use in a database. Every time you go to enter a new employee's information or customer invoice, the city field will always be 'New York' until you change it to something else.

Adding a default value is easy, simply open a table in Design view, click the field you want to give a default value, and type a new default value in its corresponding field property. In our example, we will make the default number of cylinders 6:



Setting a Required Value

A required value is a value that must be entered into a record in order for the database to be considered complete. If you have ever filled out a form on the Internet, you usually see an asterisk (*) beside fields that must be entered in order for a data entry to be valid:

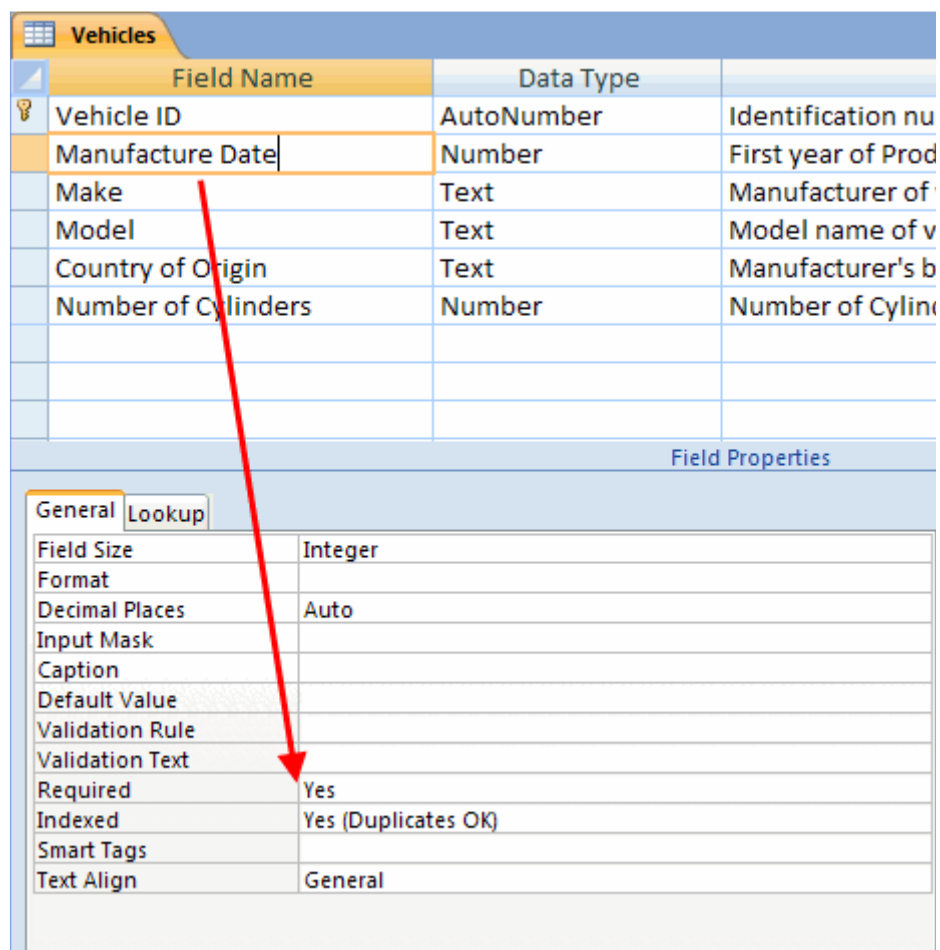


Zip

*Telephone

*Email

Making a value a required value is as simple as clicking yes or no in the Required combo box:



Field Name	Data Type	
Vehicle ID	AutoNumber	Identification nu
Manufacture Date	Number	First year of Prod
Make	Text	Manufacturer of
Model	Text	Model name of v
Country of Origin	Text	Manufacturer's b
Number of Cylinders	Number	Number of Cylind

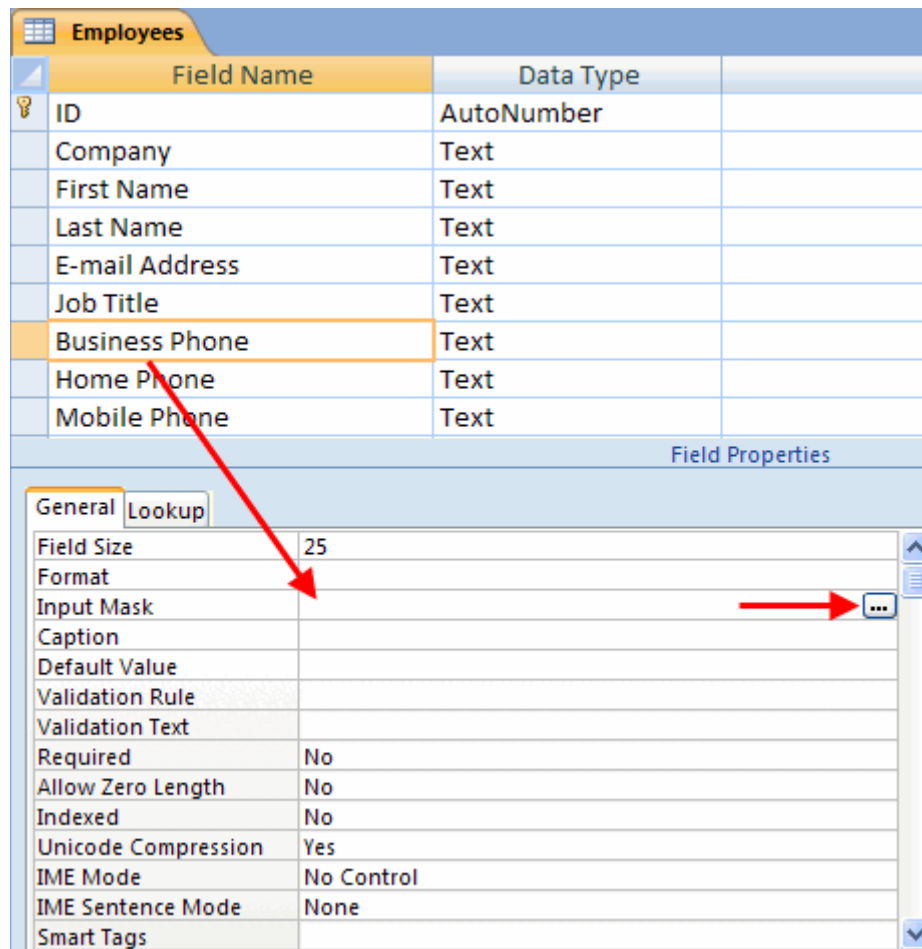
Field Properties	
General	
Field Size	Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Indexed	Yes (Duplicates OK)
Smart Tags	
Text Align	General

Creating and Using Input Masks

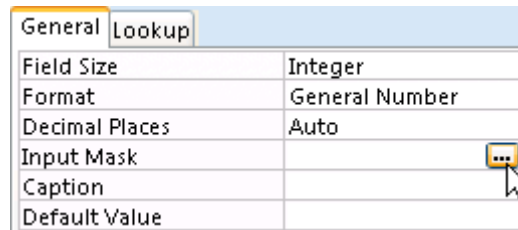
An input mask is defined as a type of template that is used when entering data into a field that follows some sort of format. For example, the phone number 4827482234 is much harder to read than (482) 748-2234. Access can set up input masks to make sure data is entered completely and correctly. The Employees table in the Northwind sample database makes use of such an input mask:

Business Phone ▾
(123)456-7890
(123)456-7890
(123)456-7890
(123)456-7890

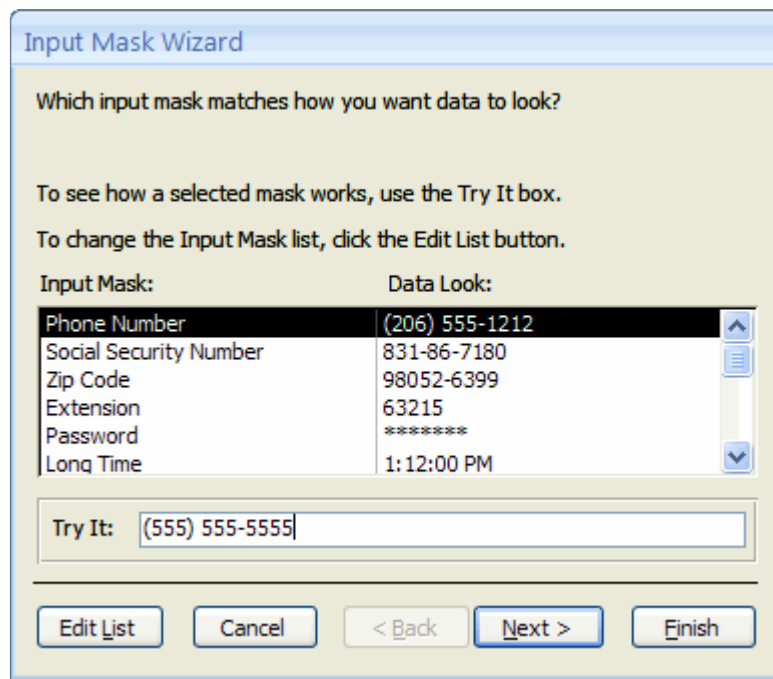
Different data types have different input masks. To setup or modify an input mask, open a table in Design view:



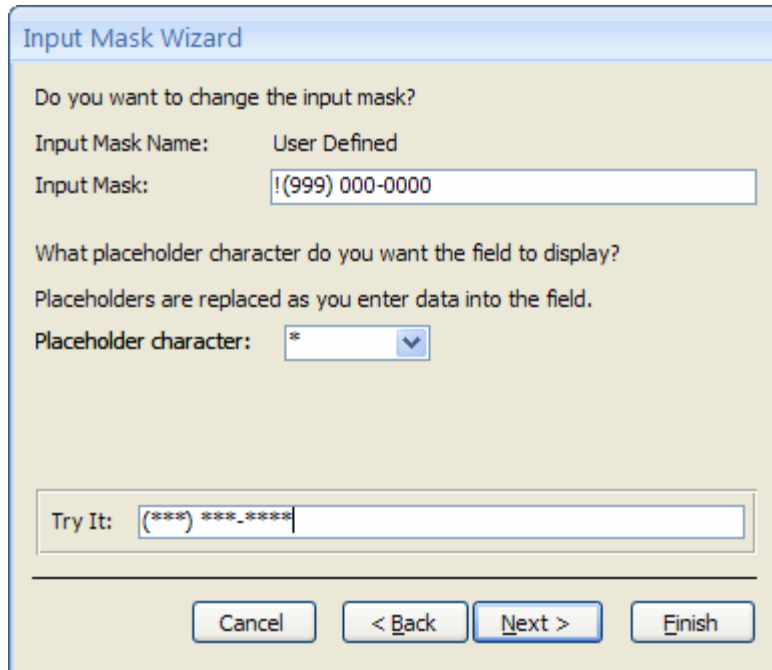
Then, open the field's properties and find a field that does not offer the option to type or choose from a combo box. Click it and a small symbol will appear (...) on the right-hand side.



Click it to start the Input Mask Wizard:

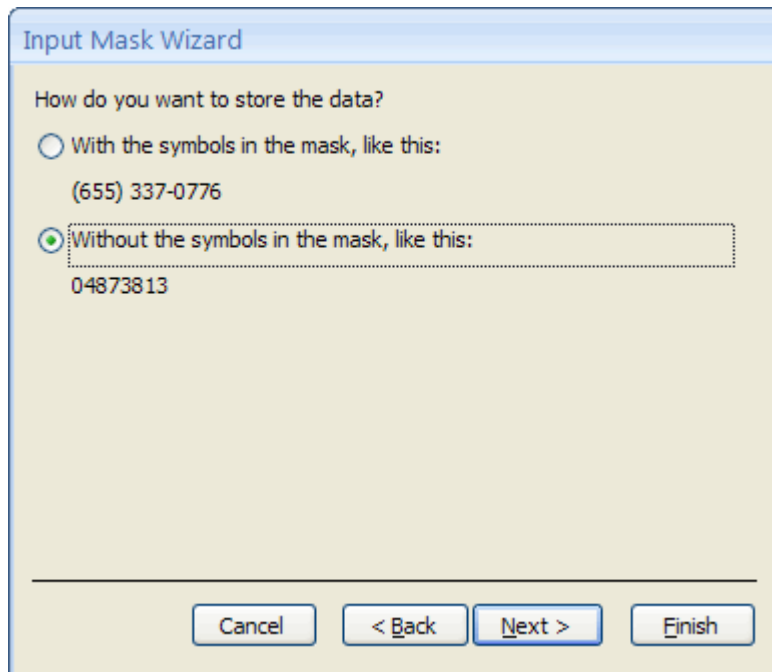


Here you can select from the various input masks that are available. The first option is the phone number mask; give it a try by clicking in the Try It: text box and typing. Click Next.



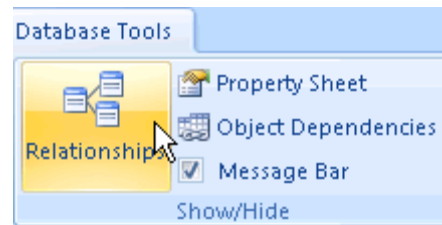
The 'Input Mask Wizard' dialog box is shown. It has a title bar 'Input Mask Wizard'. The first question is 'Do you want to change the input mask?'. Below this, 'Input Mask Name:' is 'User Defined' and 'Input Mask:' is '(999) 000-0000'. The next question is 'What placeholder character do you want the field to display?'. Below this, it says 'Placeholders are replaced as you enter data into the field.' and 'Placeholder character:' is set to '*' with a dropdown arrow. At the bottom, there is a 'Try It:' field showing '(***) ***_****'. Navigation buttons at the bottom are 'Cancel', '< Back', 'Next >', and 'Finish'.

Here you can change the placeholder character to some other symbol than the underscore character. Click Next.

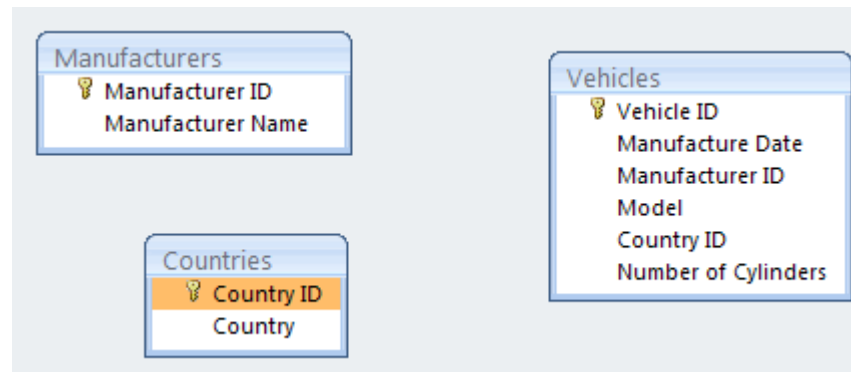


The 'Input Mask Wizard' dialog box is shown. The title bar is 'Input Mask Wizard'. The question is 'How do you want to store the data?'. There are two radio button options: 'With the symbols in the mask, like this:' with the example '(655) 337-0776', and 'Without the symbols in the mask, like this:' which is selected, with the example '04873813'. Navigation buttons at the bottom are 'Cancel', '< Back', 'Next >', and 'Finish'.

You can choose how you would like to store the data in the table, either with the symbols or without the symbols. If you choose to keep the symbols in the database to make the data easier to read, you must make sure the data type for the Phone Number field is Text as non numerical characters are not allowed in a Number field. Click Next, and then Finish to complete the



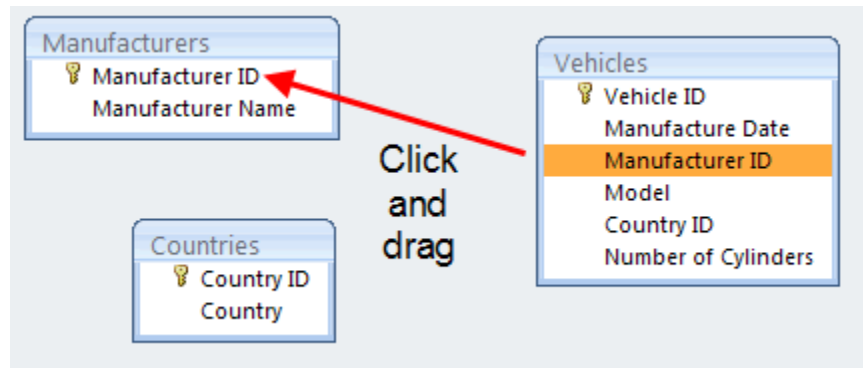
Consider the following tables:



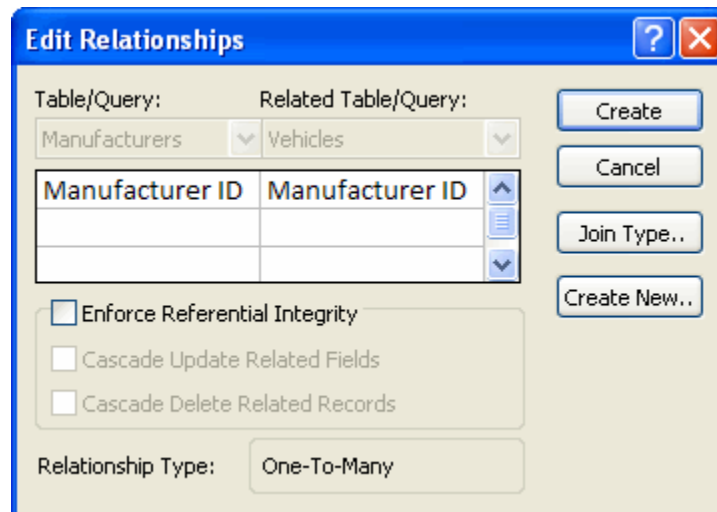
Instead of naming every country and manufacturer in the Vehicles table, we can lighten the size of the Vehicles table by taking those two pieces of information and storing them in a separate location. In a database of this size this may not seem like that big of a deal, but as we proceed through this manual, the reasoning will become clearer.

Make and Country in the previous Vehicles table are replaced by Manufacturer ID and Country ID. The Manufacturers and Countries tables listed above contain only the respective ID and name for each record. However, Access does not automatically recognize the relationships by itself; we must tell it which fields relate in these tables.

To establish a relationship between the Vehicles and Manufacturers tables, simply click and drag the Manufacturer ID field from one table to another:



When you release the mouse button, you will see the Edit Relationships dialogue box:



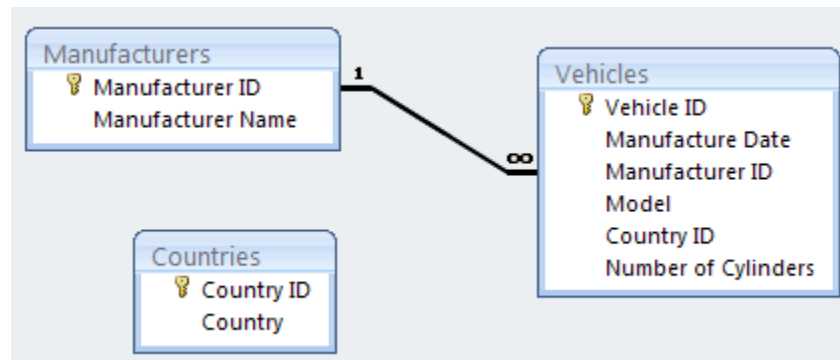
Access has determined that the style of this relationship is One-To-Many, based on the data that was collected from the drag and drop operation. Before clicking the Create button, you should click the Enforce Referential Integrity check box.

Referential Integrity is a set of rules and conditions that make data entry into databases safer. You should try to enforce referential integrity whenever possible. It insures that all related fields are valid when considered together in a database, and prevents you from accidentally deleting related data. To make referential integrity work, the following three conditions must be satisfied:

- The matching field from one table is a primary key or has a unique index. (True: Manufacturer ID is the primary key)
- The fields in the relationship have the same data type. (True: both fields are numerical)

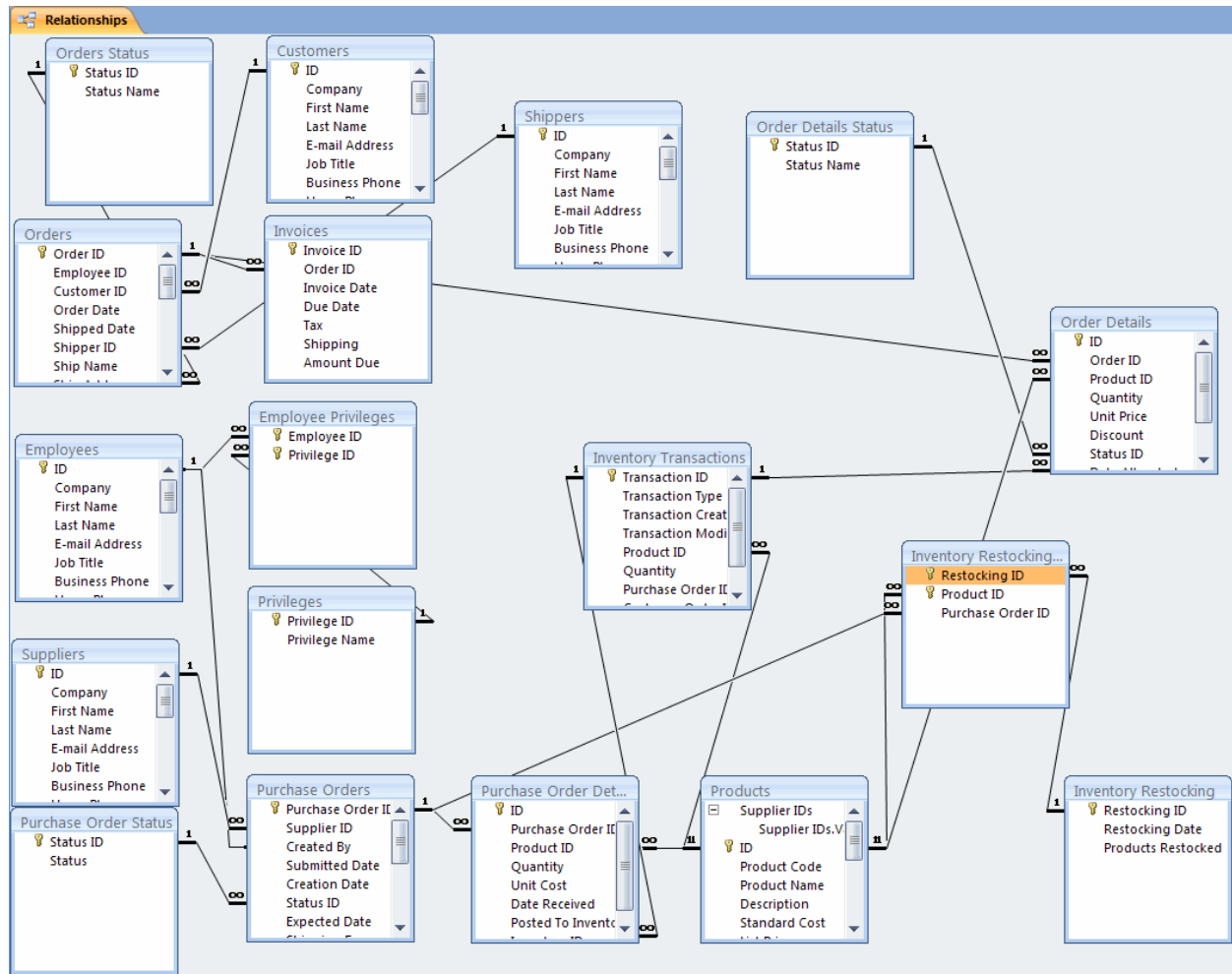
- Both tables are stored in the same database. (True: both tables are in the same database file, not a linked table.)

Since all of the necessary conditions have been satisfied, click Create to establish the relationship:

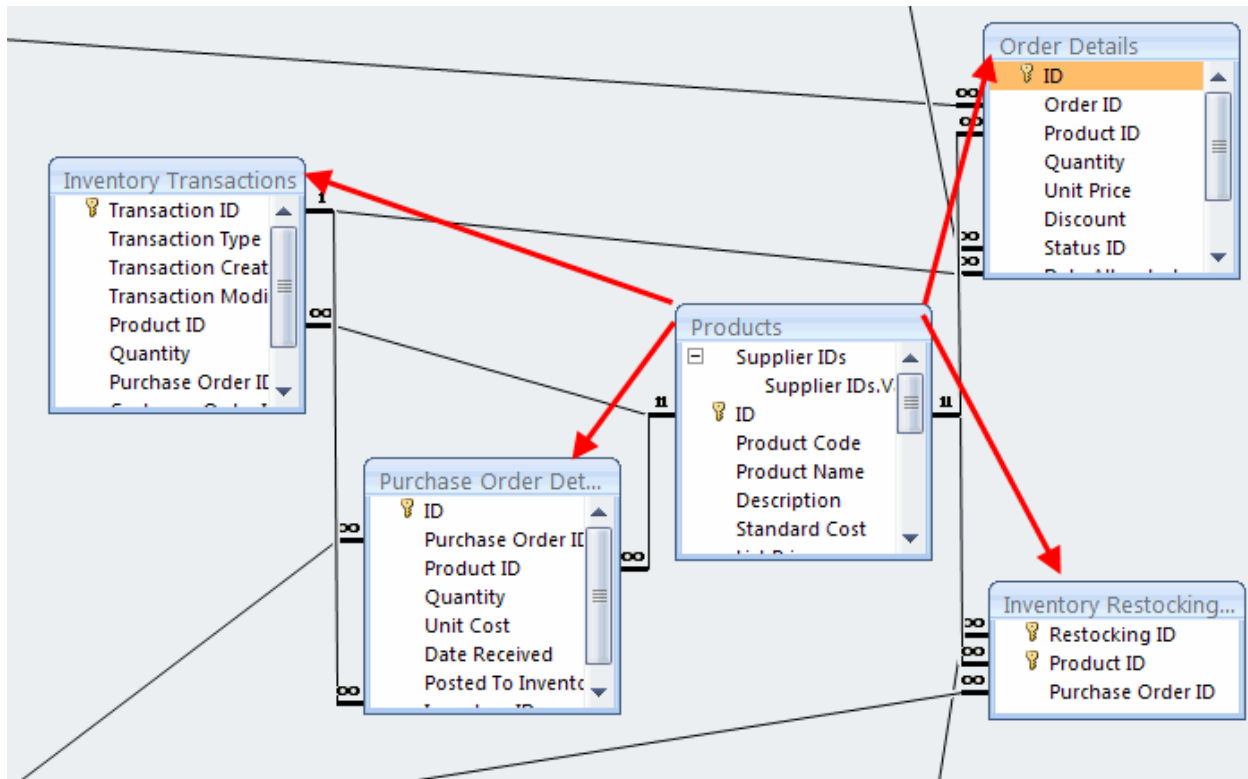


You can see the one-to-many relationship in the diagram above. One Manufacturer ID from Manufacturers may correspond to many Manufacturer IDs from Vehicles.

Now let's examine the relationships in the Northwind sample database. As you can see in the diagram below, there is a lot of action happening in this database!



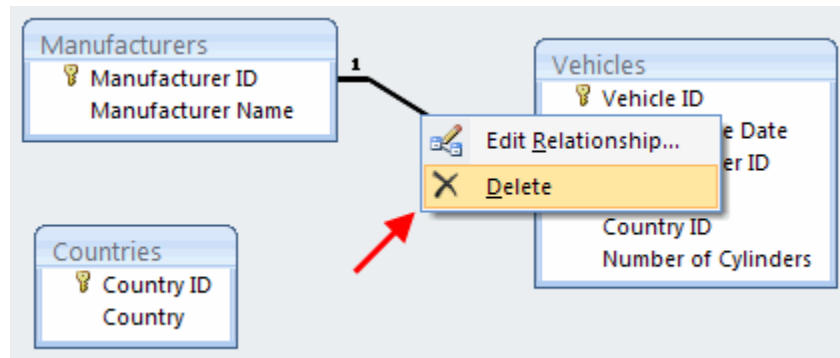
Let's examine the Products table in this database:



Each product record contains many attributes describing the nature of the product that Northwind sells, one of which is an ID field. In fact, each relationship in the Product table is based on the ID field. There are four relationships denoted by black lines coming from the ID field, relating to Inventory Transactions, Purchase Order Details, Inventory Restocking Details, and Order Details. Consider the relationship with the Order Details table. One product that Northwind sells has the potential to be sold many times, therefore each sale of each product is logged in the Order Details table. The Products table is in a one-to-many relationship with the Order Details table.

Creating the relationships is very simple if the fields in your tables have been well planned; simply drag and drop fields. When deleting a relationship, remember that doing so can have a big impact on how the database works. Make sure you actually do need to remove the relationship!

Deleting a relationship in the Relationships window is easy, just right-click on the relationship you want to remove and click Delete:



Access confirms that you want to delete the relationship, click Yes to confirm.

SECTION 4 & 5: Creating and Using Advanced Query Features

In the last section of this manual we will deal with queries. Queries are really the second most important objects in a database (next to tables) because they have the ability to find information for you.

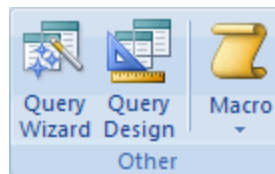
Review of Queries

As a quick review, a query is a question that is asked of the data in a database. Although they are a structured piece of computer code, they are no more difficult than merely asking a question like, “How much did salesperson X sell in seafood products last year?” Queries primarily get their data from tables; however, a query can extract information from another query as well.

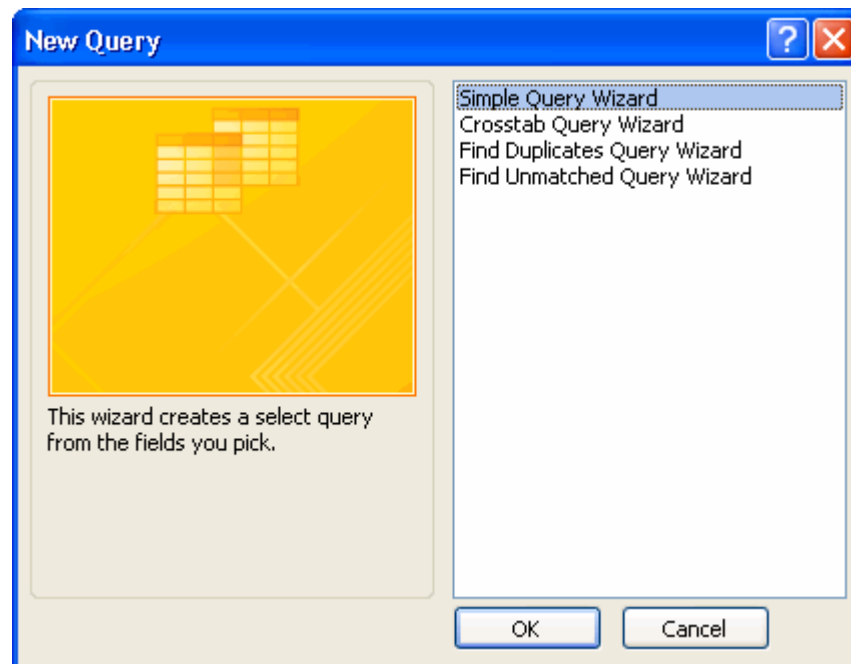
Most queries are called select queries; they search for information in your database based on criteria you specify. There is another category of query called an action query that is designed to insert new data into a new table, delete old data from a table, or append to data already in a database based on criteria.

Creating a Query

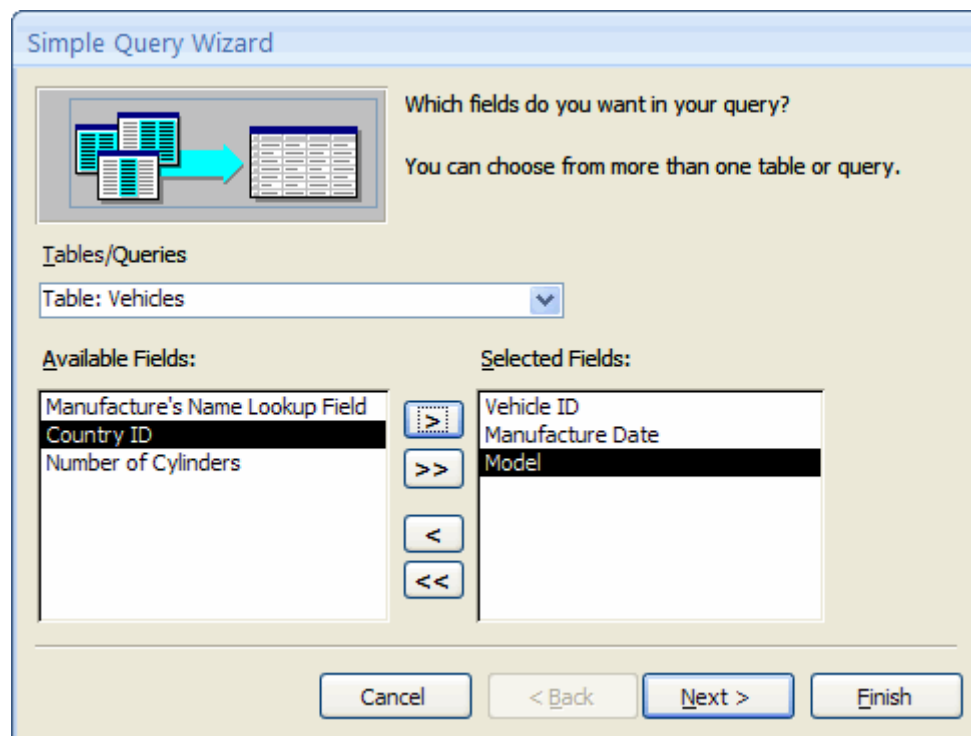
Access makes creating a query an easy task by using either the Query Wizard or Design view. In this section we will cover the basics of each method. To use the Wizard, click the Query Wizard command in the Other section of the Create ribbon:



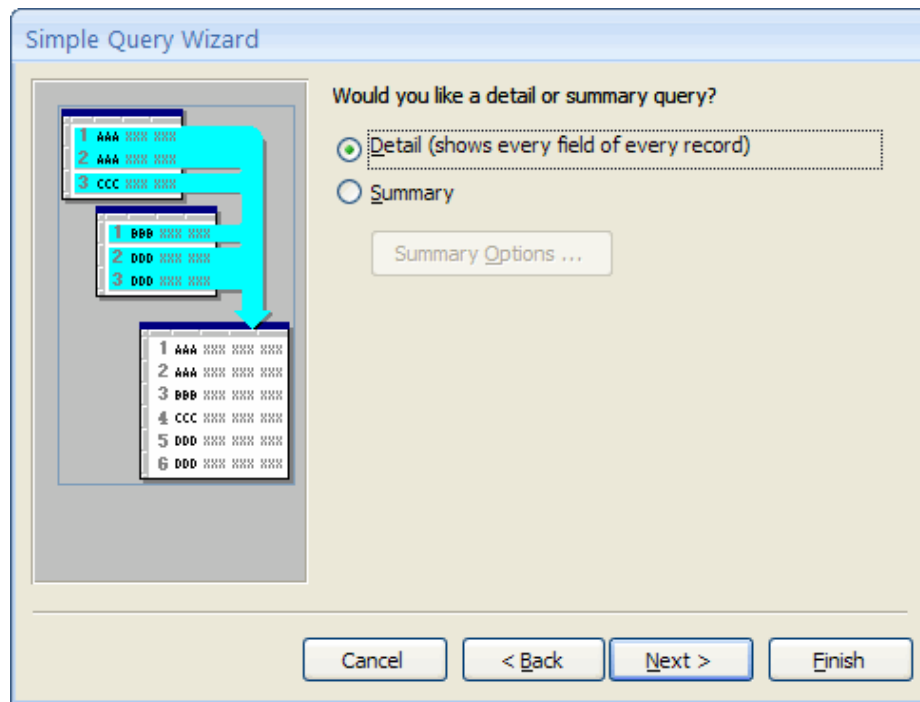
You will be prompted to choose a new type of query. In this example, we will explore the Simple Query Wizard:



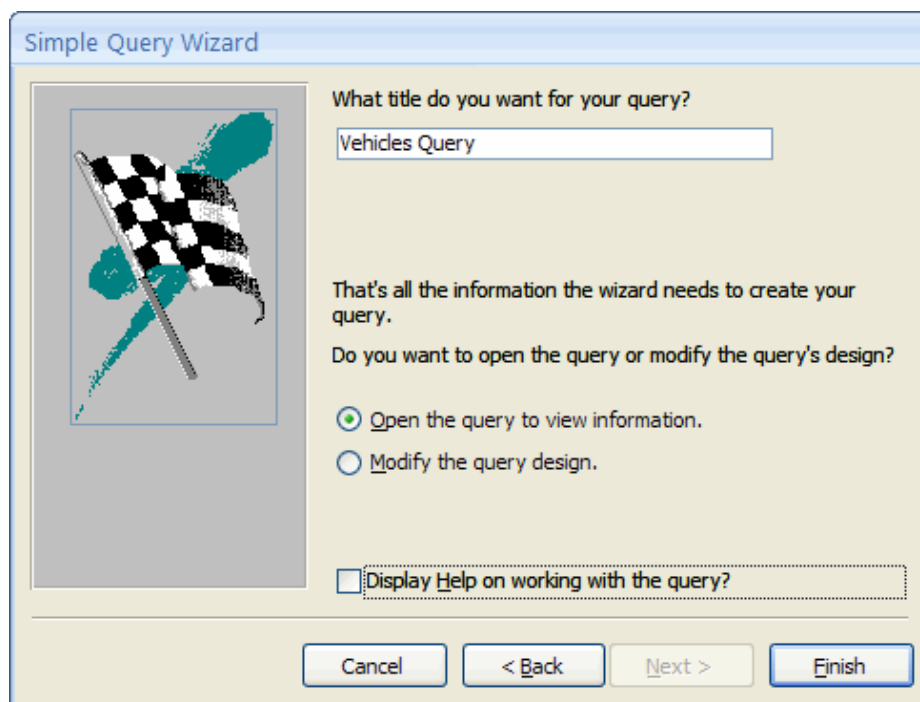
Access prompts you to select the table or query that contains the source information, choose the fields you want to show in the query (> moves a single field, >> moves all fields), and then click Next:



The next page of the Wizard gives you the option to apply summary calculations (like the maximum, minimum, or average value) to a field:



The final page of the Wizard lets you name the query (feel free to use a meaningful name is recommended; you have lots of space). You also have the option to open the query right away or modify the design in Design view:



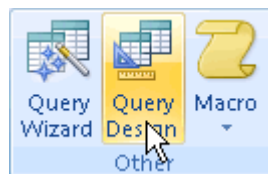
Clicking Finish will display the query results in what is essentially Datasheet view:

Vehicles Query		
Vehicle ID #	Manufacture Date	Model
1	1982	Corvette
2	2003	V12 Vanquish
3	2000	S2000
4	2003	Tiburon
5	2002	575 Marinello
6	1979	Spider
7	1965	Falcon
8	2005	GT
* (New)		

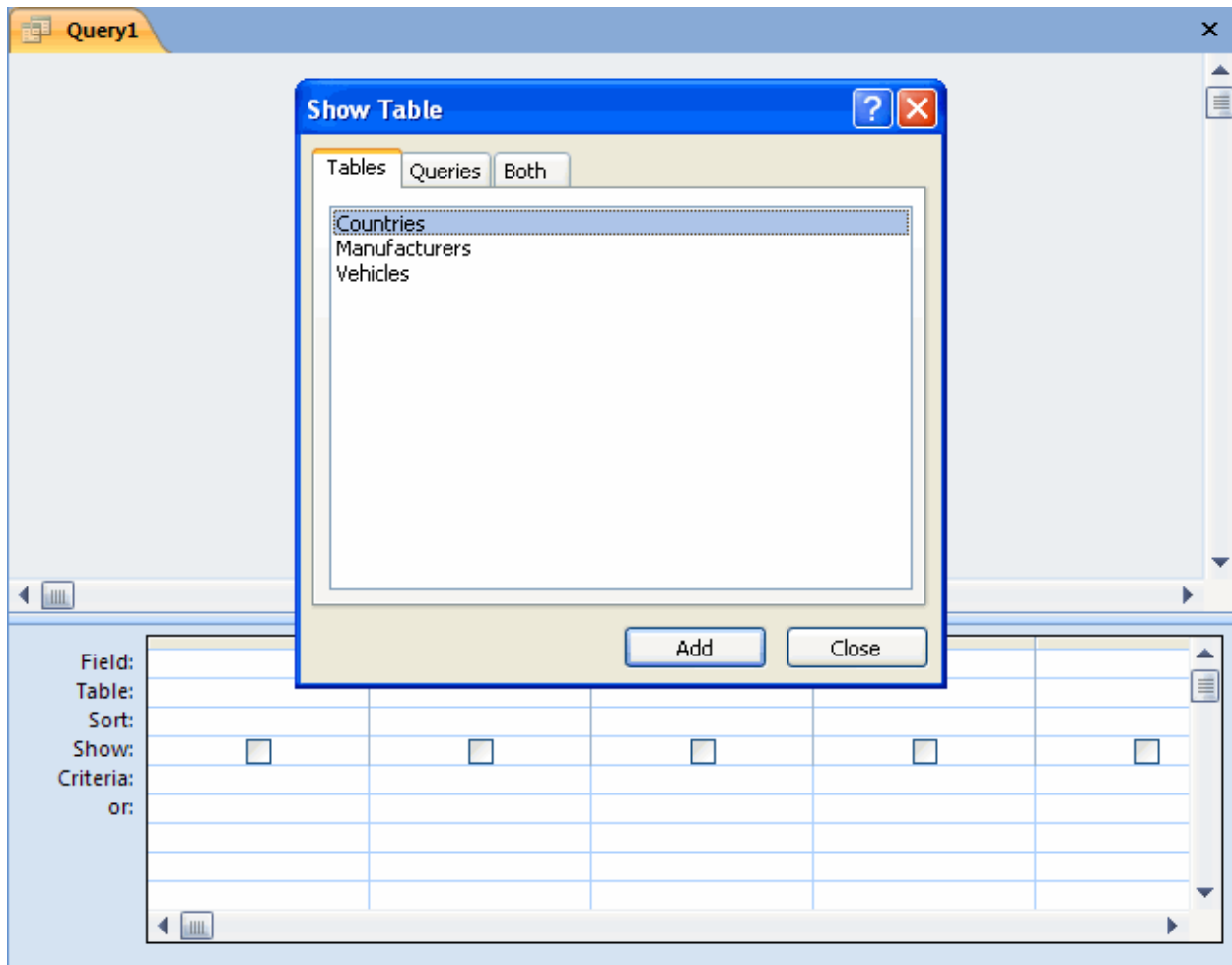
Record: 1 of 8 No Filter Search

Use the navigation buttons at the bottom of the window to browse through the results.

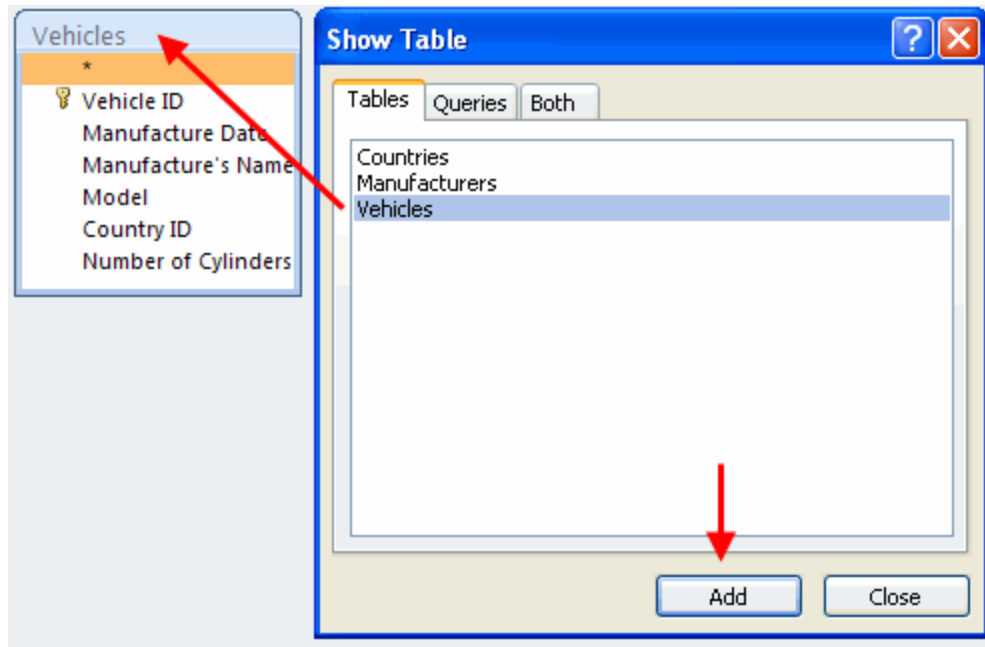
Let's create the same query using Design view. To start working with a new blank query, click the Query Design command:



Query Design view will open with the Show Table dialogue box.

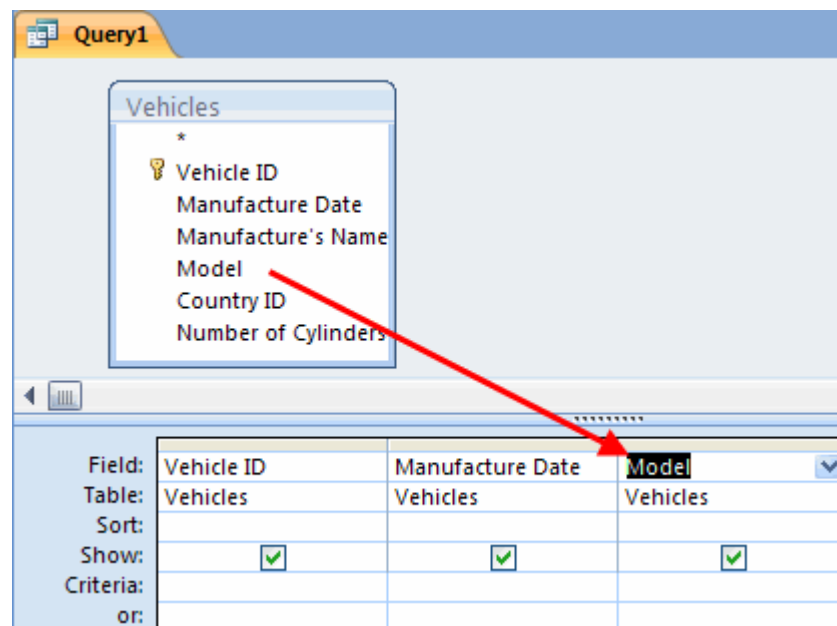


Using this box, add as many tables and/or queries as you need to get the information relevant to your query. Select each necessary object and click Add.



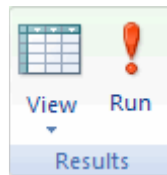
The source table will be added to the working space, with each field in the table listed. The primary key of the table contains a small key icon beside it. When you have finished adding the objects relevant to your table, click Close.

To add fields to your query, simply click and drag the fields from the tables to the areas provided in Design view:



You also have the ability to add certain search criteria, choose whether a field will be shown in the query results, add additional search criteria, and more. We will explore more of Design view's functionality later in this section.

To execute the query, click the Run command in the Results section of the Query Tools - Design ribbon:



The results will be displayed in Datasheet view:

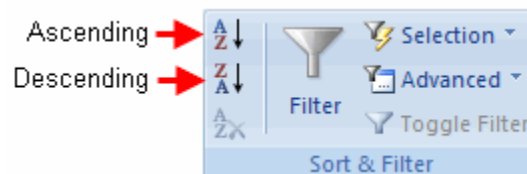
Query1		
Vehicle ID #	Manufacture Date	Model
1	1982	Corvette
2	2003	V12 Vanquish
3	2000	S2000
4	2003	Tiburon
5	2002	575 Marinello
6	1979	Spider
7	1965	Falcon
8	2005	GT
*	(New)	

Sorting a Query

Once you have designed and executed a query, you will be shown results in Datasheet view. You can easily apply a sorting scheme to query results. Consider the following query that was used to create a basic list of the products that Northwind Traders sell:

Products Query		
ID	Product Name	Standard Cost
1	Northwind Traders Chai	\$13.50
3	Northwind Traders Syrup	\$7.50
4	Northwind Traders Cajun Seasoning	\$16.50
5	Northwind Traders Olive Oil	\$16.01
6	Northwind Traders Boysenberry Spread	\$18.75
7	Northwind Traders Dried Pears	\$22.50
8	Northwind Traders Curry Sauce	\$30.00
14	Northwind Traders Walnuts	\$17.44
17	Northwind Traders Fruit Cocktail	\$29.25
19	Northwind Traders Chocolate Biscuits Mix	\$6.90
20	Northwind Traders Marmalade	\$60.75

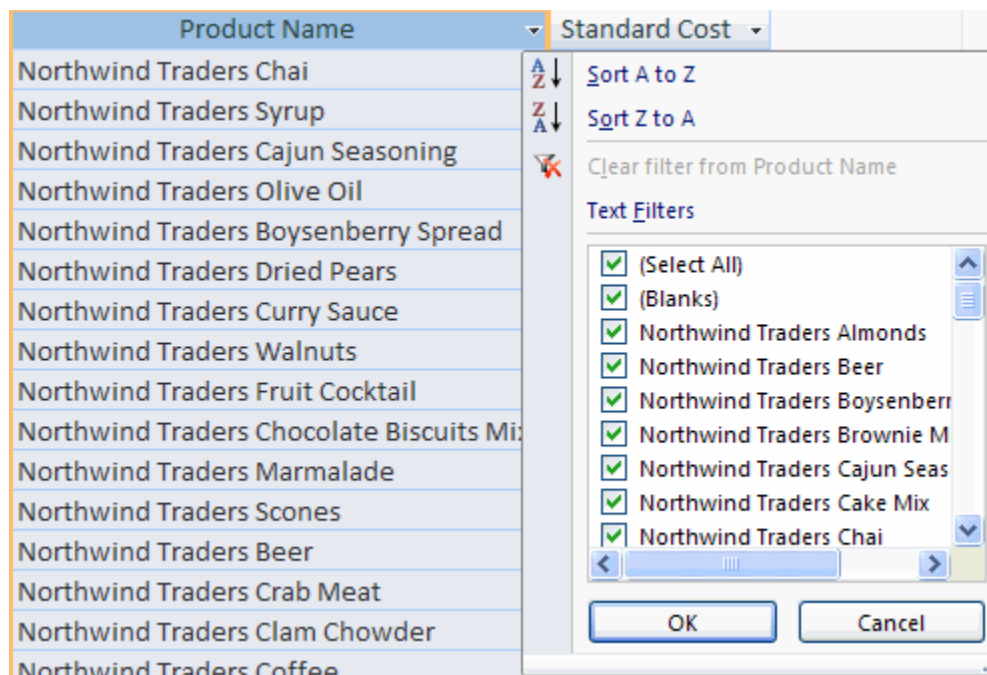
There are two ways to easily sort a query. First, select a column of data by clicking on the name of the column (such as Product Name column header). You can use the Sort & Filter section of the Home ribbon and click either the Sort Ascending or Sort Descending commands:



The data in the column and the respective row will sort itself, for example, in Ascending order:

Products Query		
ID	Product Name	Standard Cost
74	Northwind Traders Almonds	\$7.50
34	Northwind Traders Beer	\$10.50
6	Northwind Traders Boysenberry Spread	\$18.75
85	Northwind Traders Brownie Mix	\$9.00
4	Northwind Traders Cajun Seasoning	\$16.50
86	Northwind Traders Cake Mix	\$10.50
1	Northwind Traders Chai	\$13.50
91	Northwind Traders Cherry Pie Filling	\$0.00
99	Northwind Traders Chicken Soup	\$0.00
48	Northwind Traders Chocolate	\$9.56

Notice that a very small 'up' arrow is visible on the far right-hand end of the header. The second method of sorting the data involves using the column header itself. Click the small pull-down arrow on the right-hand side of the column header:



This pull-down menu provides much of the functionality that the Sort & Filter section provides. Simply click the type of sort you want to apply. Access also gives you the ability to sort multiple columns of data at a time. To select multiple columns, first select a single column as above. Then press and hold the Shift key, and click the column headers of any adjacent column.


Filtering a Query

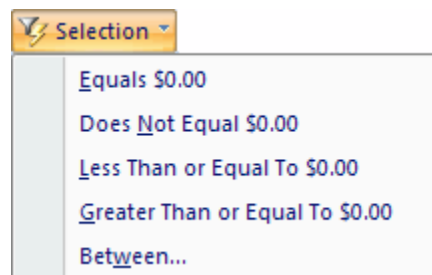
Applying a filter to a query is a bit like querying a query, where you apply extra criteria to search results in order to narrow down the results you need (or find that the query does not give you the results you thought you were going to get).

There are a few different ways to filter a query, so let's talk about each.

Filtering by Selection is one of the easiest methods of filtering. Filter by Selection lets you select any field that was returned by a query and filtering the query results based on that one field. For example, consider the following product query that has already been filtered in alphabetical order:

Products Query		
ID	Product Name	Standard Cost
74	Northwind Traders Almonds	\$7.50
34	Northwind Traders Beer	\$10.50
6	Northwind Traders Boysenberry Spread	\$18.75
85	Northwind Traders Brownie Mix	\$9.00
4	Northwind Traders Cajun Seasoning	\$16.50
86	Northwind Traders Cake Mix	\$10.50
1	Northwind Traders Chai	\$13.50
91	Northwind Traders Cherry Pie Filling	\$0.00
99	Northwind Traders Chicken Soup	\$0.00
48	Northwind Traders Chocolate	\$9.56
19	Northwind Traders Chocolate Biscuits Mix	\$6.90
41	Northwind Traders Clam Chowder	\$7.24
43	Northwind Traders Coffee	\$34.50
93	Northwind Traders Corn	\$0.00

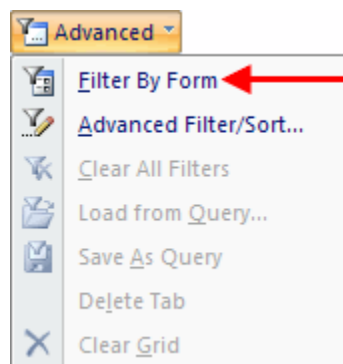
Notice how a few of the records returned have a Standard Cost of \$0.00. If we want to find out how many other products have not had a price assigned to them yet, click any instance of a \$0.00 price to select the cell. Click the pull-down arrow beside the Selection command ( Selection) in the Sort & Filter section:



The options listed in the pull-down menu allow you to apply logical filtering to the current selection. Since we wish to find all of the items with the same price, select the first option. This will display all items meeting the search criteria:

Products Query		
ID	Product Name	Standard Cost
91	Northwind Traders Cherry Pie Filling	\$0.00
99	Northwind Traders Chicken Soup	\$0.00
93	Northwind Traders Corn	\$0.00
82	Northwind Traders Granola	\$0.00
92	Northwind Traders Green Beans	\$0.00
97	Northwind Traders Hot Cereal	\$0.00
89	Northwind Traders Peaches	\$0.00
88	Northwind Traders Pears	\$0.00
94	Northwind Traders Peas	\$0.00
90	Northwind Traders Pineapple	\$0.00
83	Northwind Traders Potato Chips	\$0.00
96	Northwind Traders Smoked Salmon	\$0.00
95	Northwind Traders Tuna Fish	\$0.00
98	Northwind Traders Vegetable Soup	\$0.00
* #####		\$0.00

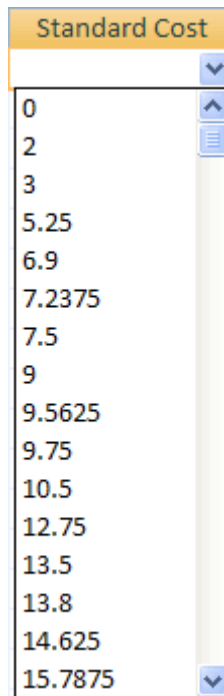
The next method of filtering is Filter by Form. Click the Filter by Form option found in the Advanced command:




Each column of data is replaced by a combo box, and each value in the combo box represents one instance of every unique value in the column of data.

Products Query: Filter by Form		
ID	Product Name	Standard Cost
▼		

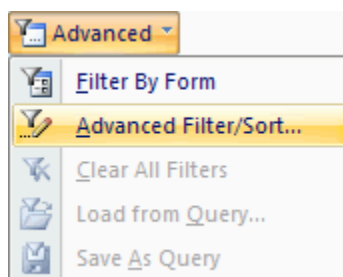
For example, click the combo box in the Standard Cost column:



Select one of the options in the list to only display the records which have the same standard cost as the value you selected from the combo box. Pick a price from the column, such as 7.5, and then click the Toggle Filter command ( Toggle Filter) in the Sort & Filter section of the Home ribbon:

Products Query		
ID	Product Name	Standard Cost
3	Northwind Traders Syrup	\$7.50
21	Northwind Traders Scones	\$7.50
74	Northwind Traders Almonds	\$7.50
* #####		\$0.00

The final type of filter that Access can perform is an Advanced Filter; a manual filter using Design view. To use an advanced filter, click the Advanced Filter/Sort option in the Advanced command:



To perform an advanced filter operation, drag and drop the fields you want to consider from the table listing to the Field cells below.

The screenshot shows the 'Products Query' table listing with the following fields: ID, Product Name, and Standard Cost. Below the table listing is the advanced filter/criteria grid, which is currently empty.

Field:	Sort:	Criteria:	or:

Once you have added a field, you can specify how you want to sort the results (either ascending or descending) and what sort of criteria you want to use to filter with. For example, if you want to find all products over \$10.00 in price, drag the Standard Cost field into the Field cell, and then enter >10 into the Criteria cell:

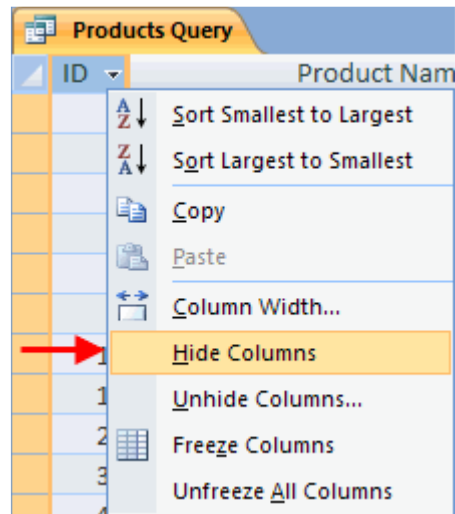
Field:	Standard Cost
Sort:	
Criteria:	>10
or:	

Then, click the Toggle Filter command to filter the results:

Products Query		Products QueryFilter1
ID	Product Name	Standard Cost
1	Northwind Traders Chai	\$13.50
4	Northwind Traders Cajun Seasoning	\$16.50
5	Northwind Traders Olive Oil	\$16.01
6	Northwind Traders Boysenberry Spread	\$18.75
7	Northwind Traders Dried Pears	\$22.50
8	Northwind Traders Curry Sauce	\$30.00
14	Northwind Traders Walnuts	\$17.44
17	Northwind Traders Fruit Cocktail	\$29.25
20	Northwind Traders Marmalade	\$60.75
34	Northwind Traders Beer	\$10.50
40	Northwind Traders Crab Meat	\$13.80
43	Northwind Traders Coffee	\$34.50
51	Northwind Traders Dried Apples	\$39.75
56	Northwind Traders Gnocchi	\$28.50
57	Northwind Traders Ravioli	\$14.63
65	Northwind Traders Hot Pepper Sauce	\$15.79
66	Northwind Traders Tomato Sauce	\$12.75
72	Northwind Traders Mozzarella	\$26.10
86	Northwind Traders Cake Mix	\$10.50
* #####		\$0.00

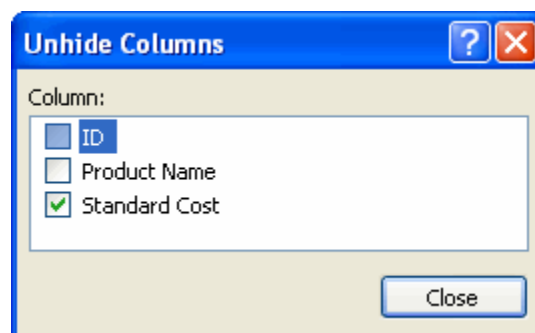
Hiding Fields

Access gives you the ability to hide and show different columns of data that may be necessary for filtering to work properly, but are not necessary to see at all times. To hide a column, right-click the column name and click Hide Columns:



To hide multiple columns, first click one column header to highlight it. Press and hold the Shift key, then click other adjacent columns to select them. Right-click on any of the columns and click Hide Columns to make them disappear from view.

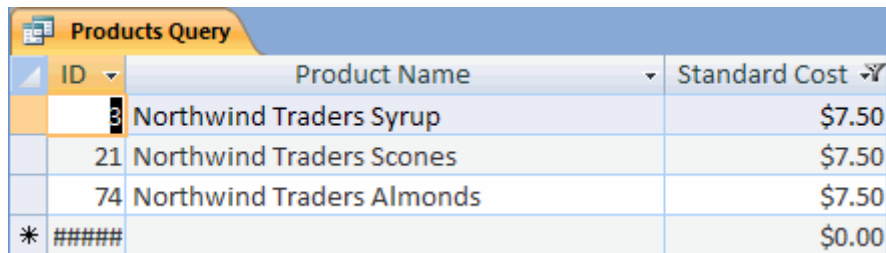
To show any hidden columns, right click the header of any column still visible and click Unhide Columns:



The Unhide Columns dialogue box will appear. Any hidden column or columns are indicated by the absence of a checkmark. Check or uncheck to show or hide columns.

Using AND OR Operators

If you recall the Filter by Form section of this lesson, we went searching for all products costing \$7.50.



ID	Product Name	Standard Cost
3	Northwind Traders Syrup	\$7.50
21	Northwind Traders Scones	\$7.50
74	Northwind Traders Almonds	\$7.50
*	#####	\$0.00

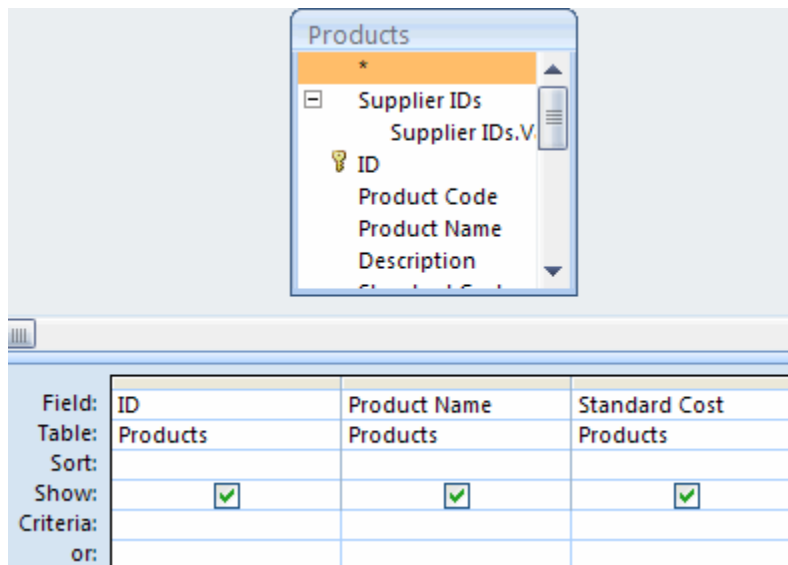
Before you entered the \$7.50 filter criteria, you might have noticed at the bottom of the Filter by Form window that there are two tabs active: Look For and Or. If we wanted to search for products that cost \$7.50 and products costing more than \$12.75 (or both), simply click the Or tab and enter more search criteria. As you add more Or searches, more Or tabs will appear to make your search as specific or vague as you require.

When dealing with AND and OR operations, it is important to understand how they work on a logical level. These operators require two pieces of input and produce one output, either true or false.

The AND operation is perhaps the easier to understand. Both conditions of AND must be satisfied in order to produce a true result. For example, if you are making a cake, you need to have wet and dry ingredients mixed together. If you have wet and no dry, or dry and no wet, or neither, you cannot make a cake.

The OR operation is true as long as one condition is true. Let's say you want to go and see a movie, but you will only go if you have at least one friend to go with. You ask Alice and Bob if they want to come. If Alice and Bob can both come, then you will go to the movies. If Alice can make it but Bob can't, you will go, and vice versa. If neither Alice nor Bob can go to the movies, you are not going to go either.

The best place to apply AND/OR operators directly is using Design view of a query (or query results). Let's take a look at the Design view for the simple products query we have been using:



We would like to see the products that cost either \$7.50 or greater than \$12.75. To calculate this, specify the criteria in the Standard Cost field of the Products Query:

Field:	Standard Cost
Table:	Products
Sort:	
Show:	<input checked="" type="checkbox"/>
Criteria:	=7.5
or:	>12.75

Each successive condition you enter in the column is called a where clause; you can add several where clauses to help find more specific values. For example, if you own a company and lost the paper copy of an invoice, and you knew that the total was \$960, entering the =960 criteria will consider only those records that match. When designing queries or filtering criteria that use AND operations, you essentially add more fields to a query and give each one a specific criteria. For example, if you know that the missing invoice was \$960 and sold by Salesperson A, enter the exact criteria into Design view.

Should you not get the results you were looking for, don't resort to merely trying different criteria that don't make sense to your situation. Think it out and ask why it isn't working or giving you the results you thought you should be getting. Another option for troubleshooting queries is to clear all of the criteria in your query and add it back one condition at a time. Make sure that before adding another field, the results of the previous query are accurate for your purposes.

Use of IIF Functions

The IIF function is used in the background of Access with VBA (Visual Basic for Applications, a programming language). Though we will not directly cover its use in this manual, its use should be familiar to you, as it works like the OR operation. If you recall the example of the OR operator, you know that you will go to the movies as long as you have someone to go with. The IIF function takes this a step further by saying if you have no friends available to come to the movies with you, you instead will go to the gym. If you get more involved with database work in the future, this is a very commonly used function.

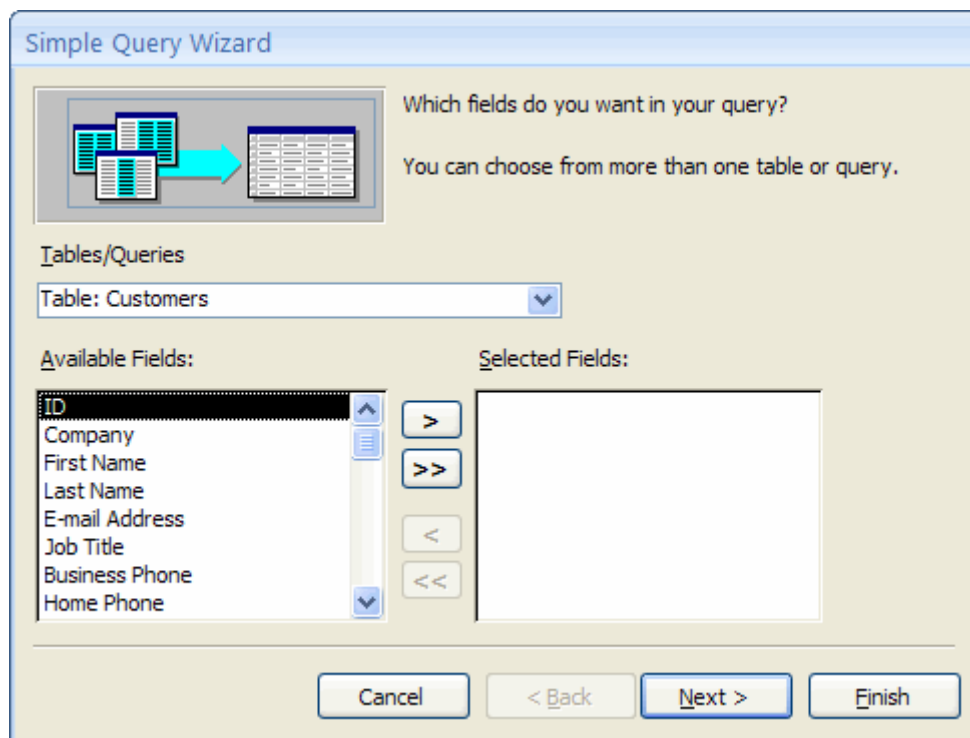
The syntax of the IIF function is `IIF(expression, doThisIfTrue, doThisIfFalse)`. The trick with this function is that no matter which value is returned by the function, the true and false portions of the equation are always evaluated. Care should be taken when making the true and false portions of an IIF function such that the database code won't reach an error like dividing a number by zero.

Multiple Table Queries

The most indispensable quality of a database management program is its ability to query many tables at once. Database programs or third-party middleware are used to not only query multiple tables of data, but multiple databases as well. In this lesson we will cover some of the more advanced procedures that can be used in Access.

Creating a Multiple Table Query

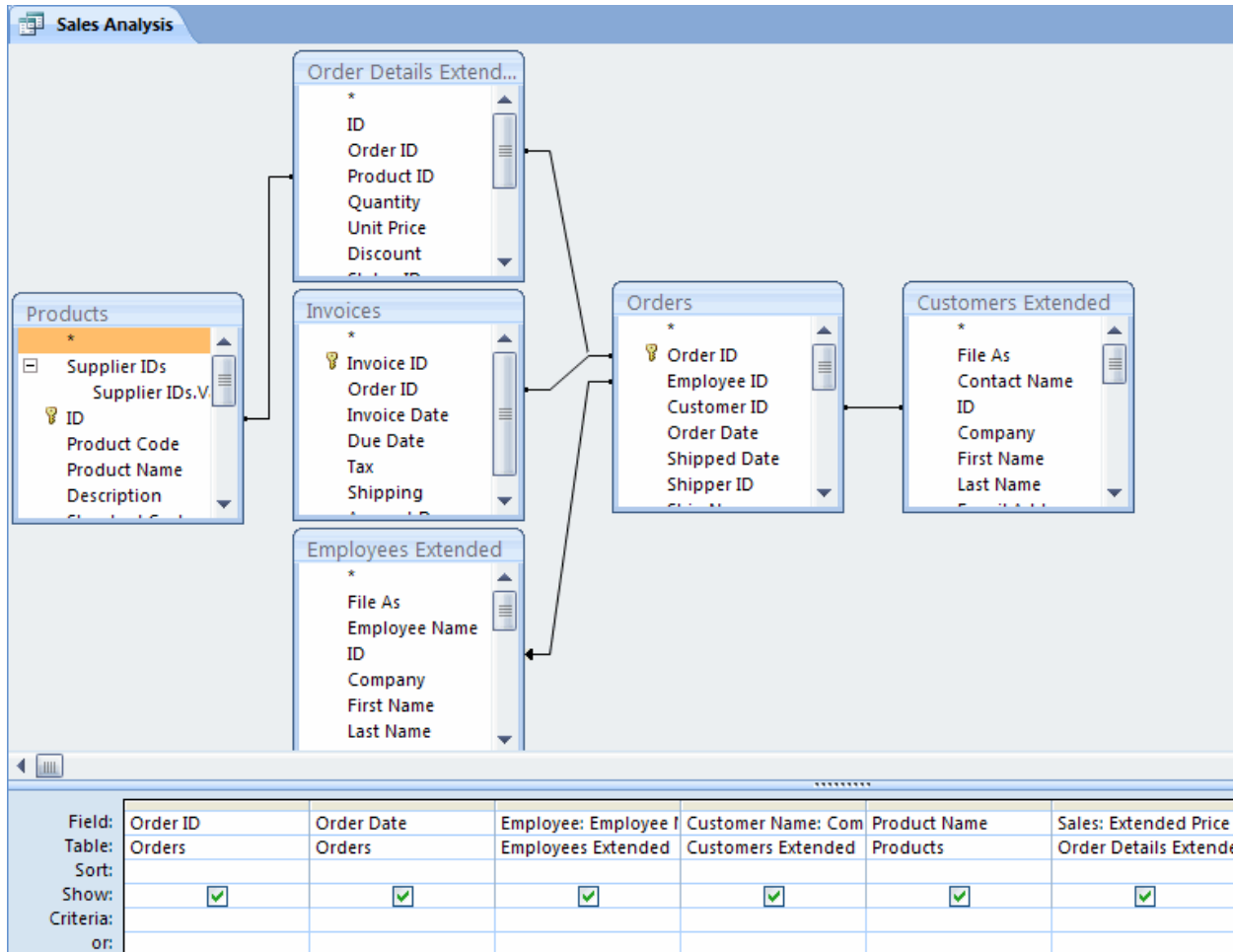
We have already seen a few multiple-table queries, including one in the last Step-By-Step exercise. The easiest way to make use of multiple table queries is to use the query Wizard:



The first page of the Wizard lets you specify what fields and data you want considered in your query. Choose the table(s) or existing query(s) you want to extract data from by using the Tables/Queries combo box. Then highlight the fields you want from the Available Fields list and click either (>) to transfer a single highlighted field or (>>) to transfer all fields in the current table or query to the Selected Fields list.

At times it may seem that you have almost too many fields. Don't worry – there are occasions where many fields are needed in order to calculate some values using a query. If you didn't include enough fields, you will not be able to successfully extract the information you need.

Once you have selected all the fields you want, click the Finish button in the Wizard. This will use the standard features of a query and allow you to either run the query right away or enter Design view. Consider the Design view of the Sales Analysis query from the Northwind sample database:



This query alone features 19 fields from 6 tables of information! If more fields are needed from any of the related tables, simply drag and drop any field listed in the tables into any field of Design view. Though every field has a purpose in this query, not every one needs to be displayed. Once the query results are shown, you can choose to hide a number of columns that are not necessary to view for your sales results.

Creating a Calculated Field

You likely recall our discussion of calculated controls inside a form and report. You can also have calculated fields in a query as well that will perform some calculation based on the data that was extracted from the query.

Consider the following simply query that extracts the product ID, Product Name, and Standard Cost fields from the Products table:

Products Query1		
ID	Product Name	Standard Cost
1	Northwind Traders Chai	\$13.50
3	Northwind Traders Syrup	\$7.50
4	Northwind Traders Cajun Seasoning	\$16.50
5	Northwind Traders Olive Oil	\$16.01
6	Northwind Traders Boysenberry Spread	\$18.75
7	Northwind Traders Dried Pears	\$22.50
8	Northwind Traders Curry Sauce	\$30.00

With fuel and administration costs rising, it is necessary to increase the prices of the products by 5%. Rather than make a report of this query and figure them out by hand or by some other means, Access allows you to make a calculated field right inside a query. Open the query in Design view and then enter the expression `=[UnitPrice] * 1.05` in the next available column:

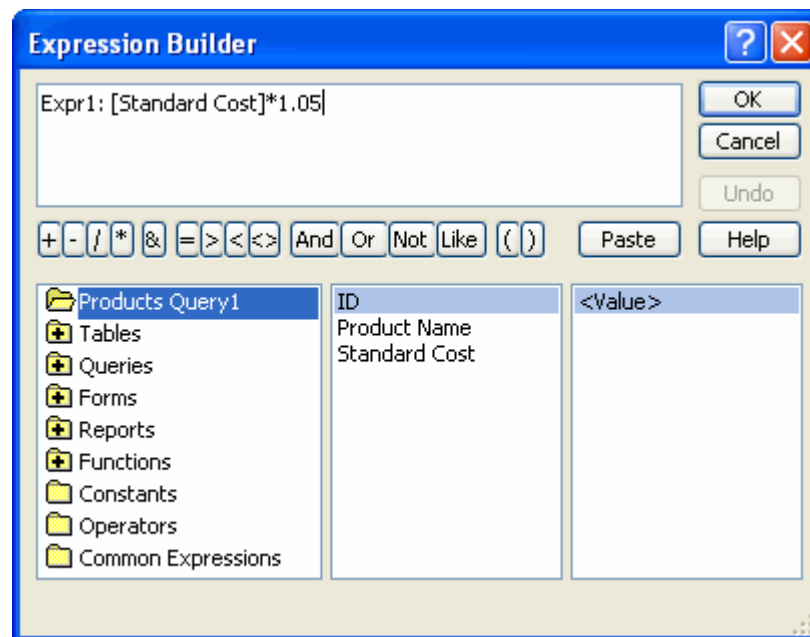
[Standard Cost] Products	Expr1: [Standard Cost]*1.05
<input checked="" type="checkbox"/>	<input type="checkbox"/>

Access names each expression Expr1, Expr2, etc. This will become the column header for the new data that is calculated by the expression. Make sure you also check the Show check box so Access will actually display the data. Once you have built your expression, click the Run command to perform the query:

Products Query1			
ID	Product Name	Standard Cost	Expr1
1	Northwind Traders Chai	\$13.50	14.175
3	Northwind Traders Syrup	\$7.50	7.875
4	Northwind Traders Cajun Seasoning	\$16.50	17.325
5	Northwind Traders Olive Oil	\$16.01	16.813125
6	Northwind Traders Boysenberry Spread	\$18.75	19.6875
7	Northwind Traders Dried Pears	\$22.50	23.625
8	Northwind Traders Curry Sauce	\$30.00	31.5

Using the Expression Builder

If you do not feel comfortable building expressions by hand or you want to build some more complicated expressions, Access contains a full-featured expression builder. When in Design view, either right-click in a field where you want to place an expression and then click Build or click the Builder command (🔧 **Builder**) in the Query Tools - Design ribbon:



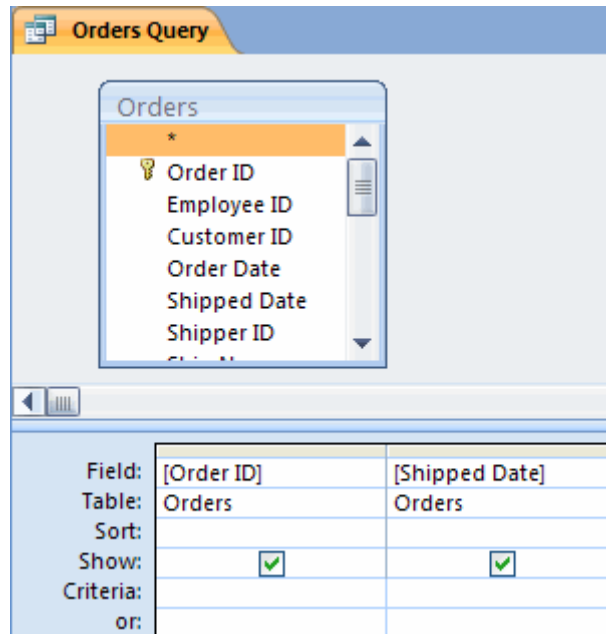
At the top of the Expression Builder dialogue box is the expression itself. This is a completely editable text box that lets you type whatever operators you wish by hand. The buttons beneath the expression insert symbols to add, subtract, multiply, divide, and compare. You can use logical operators like AND, OR, NOT and LIKE, as well as use parenthesis to enclose certain parts of your expression and ensure proper order of operation.

Underneath the buttons are listings of all objects currently in your database. Browse through these files just like they were files and folders on your computer: double-click a folder with a (+) to see all objects in that category and extract the values you need. Double-click the folder again (an open folder is denoted with a minus sign) to collapse it.

The last three folders in the far left column (Constants, Operators, and Common Expressions) contain more mathematical and logical operators which you may need to build more complicated expressions. The Common Expressions folder lets you even include page numbers, date, and time into the expression.

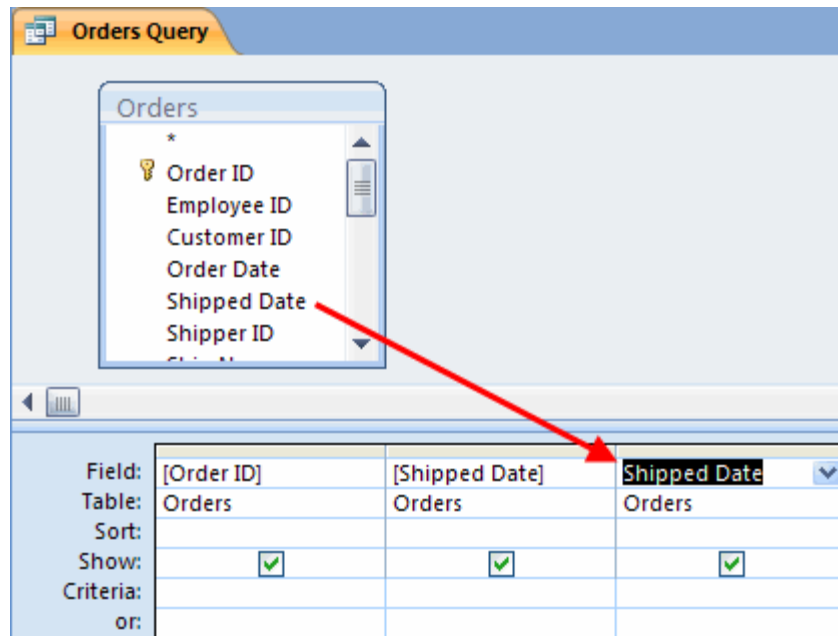
Using Queries to Summarize

Using the topics introduced in this lesson allows us to create queries that will provide a summary of data. There is no direct “Summary Query” option that you can pick from a list; instead you build your own depending on the data you are looking for. You might want to know how many orders were placed within a certain period of time, so you will use the AND operation. For example, if you work for Northwind and want to know the sales for the first three months of 2006, you would develop the following query:



In the Northwind sample database, all of the shipping details are listed in the Orders table. Running this query as is will tell you when each order was shipped. But if we want to know what order shipped between Jan. 1, 2006 and Mar. 31, 2006 we need to do a bit of editing first. In fact, the first step is already done; it is hidden in the previous sentence! We want to retrieve the orders shipped on or after the 1st of January (meaning all dates greater than or equal to 01/10/2006) and retrieve the orders shipped on or before the 31st of March (meaning all dates less than or equal to 03/31/2006).

To perform this AND operation, we first need to add the Shipped Date to the list of fields a second time. This will make visualization easier for this example:



Now enter the search criteria. You can also deselect one of the Shipped Date show checkboxes because showing both does nothing more than show the same data twice:

[Shipped Date]	Shipped Date
Orders	Orders
<input checked="" type="checkbox"/>	<input type="checkbox"/>
>=#1/1/2006#	<=#3/31/2006#

When inputting dates, you don't need to follow syntax exactly like above. In fact, the criteria for the first ShippedDate field was entered `>= 01/01/2006`, but Access automatically removed the unnecessary 0's and placed a pound sign on either side of the date.

Click the Run button to display the results of the query:

Orders Query		
	Order ID	Shipped Date
	30	1/22/2006
	31	1/22/2006
	32	1/22/2006
	33	1/31/2006
	34	2/7/2006
	35	2/12/2006
	36	2/25/2006
	37	3/9/2006
	38	3/11/2006
	39	3/24/2006
	40	3/24/2006
*	(New)	

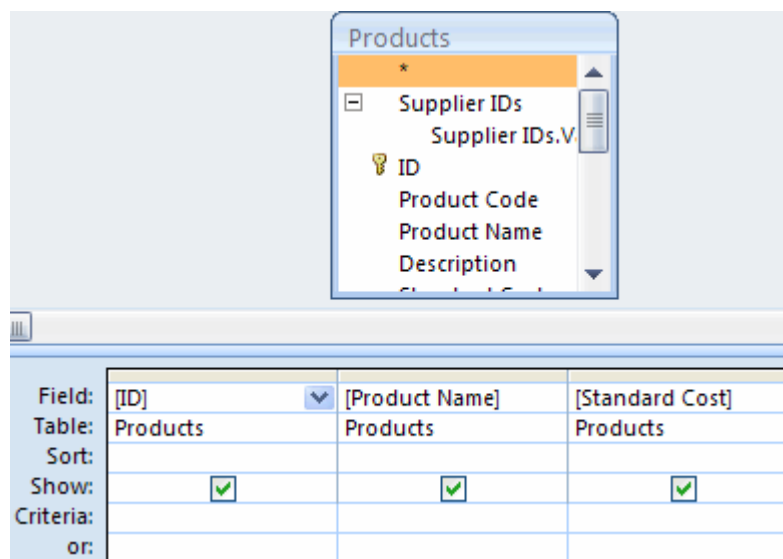
The query results show the ID and shipping date of each order, and show us that there were 11 orders shipped in the first three months of 2006.

Advanced Queries

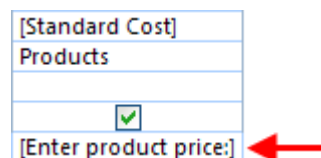
The query functionality in Access goes far beyond simply retrieving records. If you recall our review of queries, you know that there are two types of queries: select and action. We have dealt with select queries thus far, making Access retrieve records based on criteria that were entered. In this lesson, we will discuss some of the action queries. Action queries do more than simply retrieve records; they also perform some action on the database that modifies the data as well.

Creating a Parameter Query

Though a parameter query is not specifically an action query, its functionality is more specific than a select query. A parameter query lets you add specific search criteria every time you run a query. For example, let's say you are looking for a product in the Northwind sample database that is a particular price. Consider a simple product query in Design view:



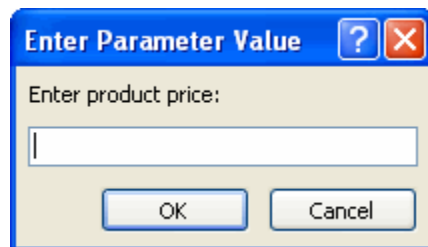
This query will retrieve the ID, name, and price of a product. We can transform this query into a parameter query by adding a new type of command to the Criteria row of a particular field. Add the text [Enter product price:] into the Criteria row.



As you will see in the next lesson, this text will appear in a special dialogue box that will prompt the user to enter a specific value.

Using Parameter Queries

Once a certain criteria have been entered into the Criteria cell of a field, running the query will produce a dialogue box:

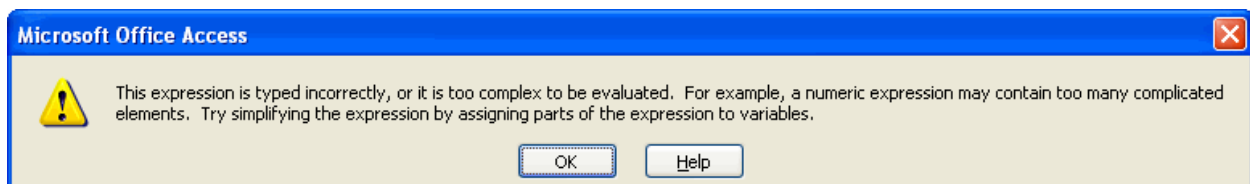


If you enter 7.50 into the text box and click OK, all products that are \$7.50 in price will be displayed:

ID	Product Name	Standard Cost
3	Northwind Traders Syrup	\$7.50
21	Northwind Traders Scones	\$7.50
74	Northwind Traders Almonds	\$7.50
*	#####	\$0.00

That's all there is to using a parameter query. Parameter queries will incorporate the user input directly into the background design of the query before it is executed. You can have multiple parameters inside a query; they are filled in from left to right (if looking at the layout of the fields in Design view).

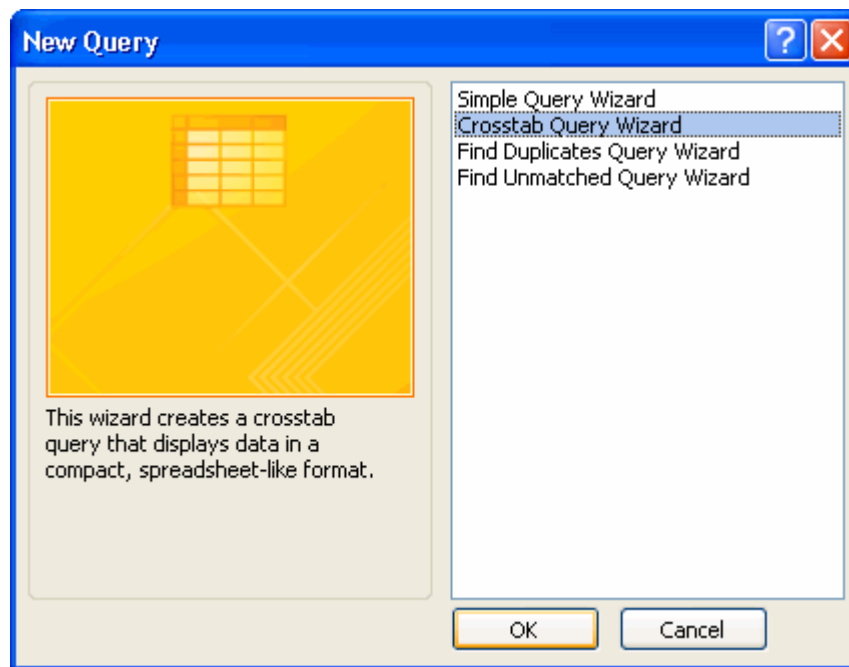
In the above example, entering 7.5, 7.50, or \$7.50 will all produce the same results so users with various levels of comfort with computers can enter information as simple or as complex as they like. Entering a price that is not in the database, such as the value 100, will not return any rows. Entering data of an incorrect data type, such as the word 'apple', will produce a syntax error:



Creating Crosstab Queries

A crosstab query is designed to show the data from a single table like a spreadsheet. Once again, this type of query is not specifically an action query but rather another special type of select query. This allows for quick comparison of data that takes much less time to produce and analyze compared to several select queries. For our introduction to crosstab queries, we will use the Wizard as creation of a crosstab query by using Design view is a bit beyond the scope of this manual. The Wizard is comprehensive enough to give you the results you need most of the time.

The easiest way to show the functionality of a crosstab query is by example. Imagine you want to create a query that shows you how many orders were placed by Northwind employees over the course of several quarters. Click the Query Wizard command and then select the Crosstab Query Wizard:



The first step of the Wizard asks you to choose which table or query the source data will come from. You can only add data from a single table or query. If you need to extract the data from multiple tables or queries, you must first create a single table or query that contains all of the information you need in order for the Wizard to work.

For this example, we will choose the Orders table:

Crosstab Query Wizard

Which table or query contains the fields you want for the crosstab query results?

To include fields from more than one table, create a query containing all the fields you need and then use this query to make the crosstab query.

Table: Employees
Table: Inventory Transaction Types
Table: Inventory Transactions
Table: Invoices
Table: Order Details
Table: Order Details Status
Table: Orders
Table: Orders Status

View
☒ Tables ☐ Queries ☐ Both

Sample:

	Header1	Header2	Header3
	TOTAL		

Cancel < Back **Next >** Finish

The next step of the Wizard lets you pick a row field. In our example, we will choose Employee ID because we want to display the number of sales by employee. You can add up to three row headings; each successive row heading will group certain results together. For example, if you wanted to find the number of sales per employee per country per region, add the employees, country, and region fields (in that order) to the row headings.

Crosstab Query Wizard

Which field's values do you want as column headings?

For example, you would select Employee Name to see each employee's name as a column heading.

Order ID
Customer ID
Order Date
Shipped Date
Shipper ID
Ship Name
Ship City
Ship State/Province
Ship ZIP/Postal Code
Ship Country/Region
Shipping Fee
Taxes

Sample:

Employee ID	Order Date1	Order Date2	Order Date3
Employee ID 1	TOTAL		
Employee ID 2			
Employee ID 3			
Employee ID 4			

Cancel < Back Next > Finish

In the next step, add Order Date to the column heading:

Crosstab Query Wizard

Which field's values do you want as column headings?

For example, you would select Employee Name to see each employee's name as a column heading.

Order ID
Customer ID
Order Date
Shipped Date
Shipper ID
Ship Name
Ship City
Ship State/Province
Ship ZIP/Postal Code
Ship Country/Region
Shipping Fee
Taxes

Sample:

Employee ID	Order Date1	Order Date2	Order Date3
Employee ID1	TOTAL		
Employee ID2			
Employee ID3			
Employee ID4			

Cancel < Back **Next >** Finish

Access has determined that the Order Date is a date data type, therefore it asks you to pick the interval in which you want to display the data. Choose Quarter and click Next:

Crosstab Query Wizard

By which interval do you want to group your Date/Time column information?

For example, you could summarize Order Amount by month for each country and region.

Year
Quarter
Month
Date
Date/Time

Sample:

Employee ID	Qtr1	Qtr2	Qtr3
Employee ID1	TOTAL		
Employee ID2			
Employee ID3			
Employee ID4			

Cancel < Back **Next >** Finish

In the next step, we are asked to specify the calculation to use for the computed part of the crosstab query. We want to find the number of orders. Therefore, select Order ID and Count. This will count each unique Order ID encountered as Access produces the query. This step also features a check box that lets you display a totals column that sums the results of each row.

Crosstab Query Wizard

What number do you want calculated for each column and row intersection?

For example, you could calculate the sum of the field Order Amount for each employee (column) by country and region (row).

Do you want to summarize each row?

☒ Yes, include row sums.

Fields:

- Order ID
- Customer ID
- Shipped Date
- Shipper ID
- Ship Name
- Ship City
- Ship State/Province
- Ship ZIP/Postal Code
- Ship Country/Region
- Shipping Fee
- Taxes

Functions:

- Avg
- Count
- First
- Last
- Max
- Min
- StDev
- Sum
- Var

Sample:

Employee ID	Qtr1	Qtr2	Qtr3
Employee ID1	Count(Order ID)		
Employee ID2			
Employee ID3			
Employee ID4			

Buttons: Cancel, < Back, Next >, Finish

The final step of the Wizard asks you to name the crosstab query and then view the query results or further customize the query using Design view:

Crosstab Query Wizard

What do you want to name your query?

Orders_Crosstab

That's all the information the wizard needs to create the query.

Do you want to view the query, or modify the query design?

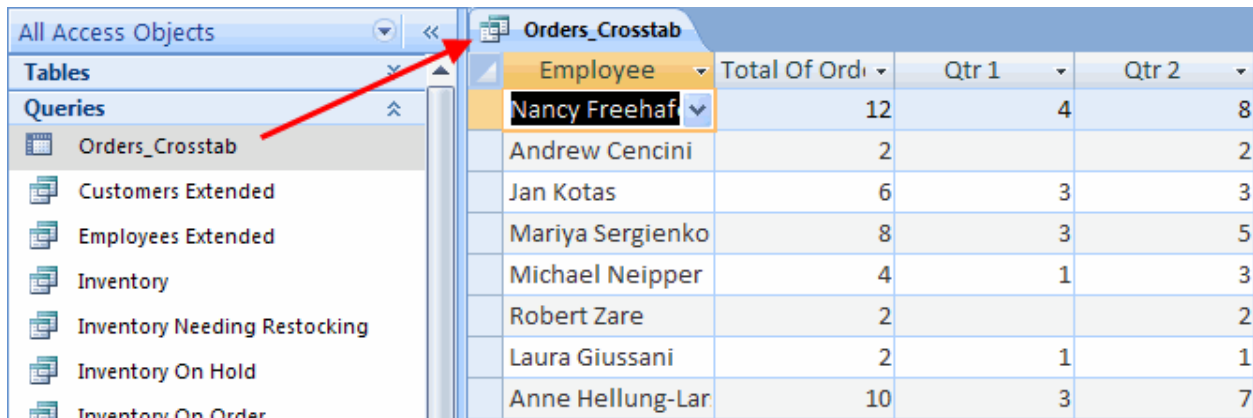
☒ View the query.

☐ Modify the design.

That's all there is to creating a crosstab query!

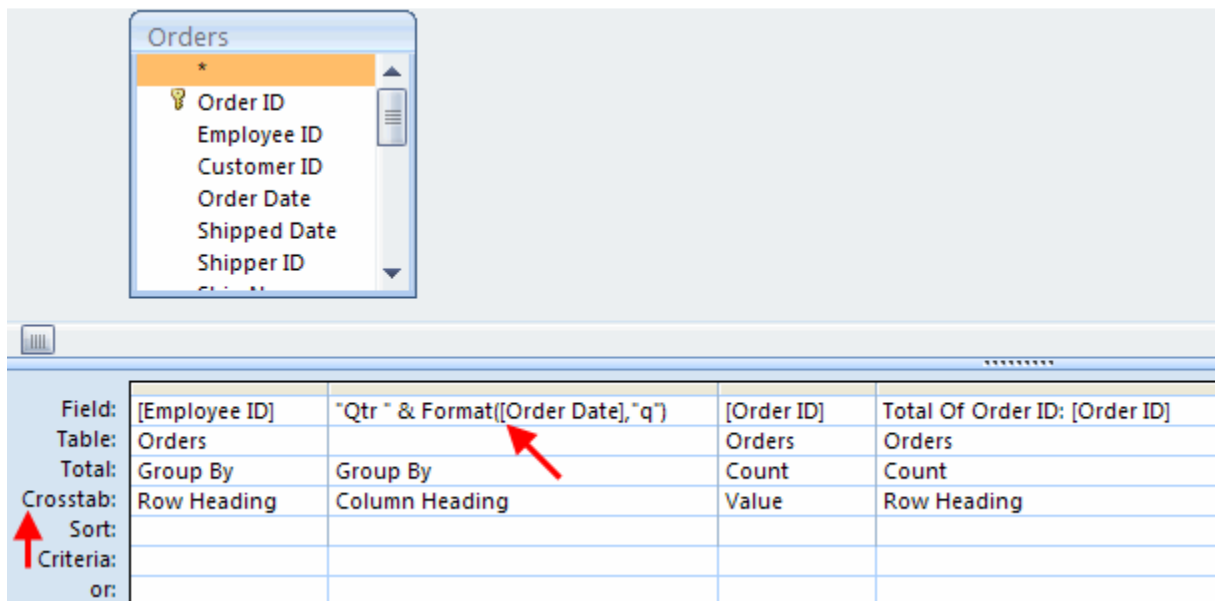
Using Crosstab Queries

To use a crosstab query, double-click its name in the Navigation Pane. Using the Orders_Crosstab example from above, the query results are displayed as follows:



Employee	Total Of Order ID	Qtr 1	Qtr 2
Nancy Freehaff	12	4	8
Andrew Cencini	2		2
Jan Kotas	6	3	3
Mariya Sergienko	8	3	5
Michael Neipper	4	1	3
Robert Zare	2		2
Laura Giussani	2	1	1
Anne Hellung-Lar	10	3	7

Though we will not cover the specifics of modification in this manual, enter Design view to see how this query is constructed:



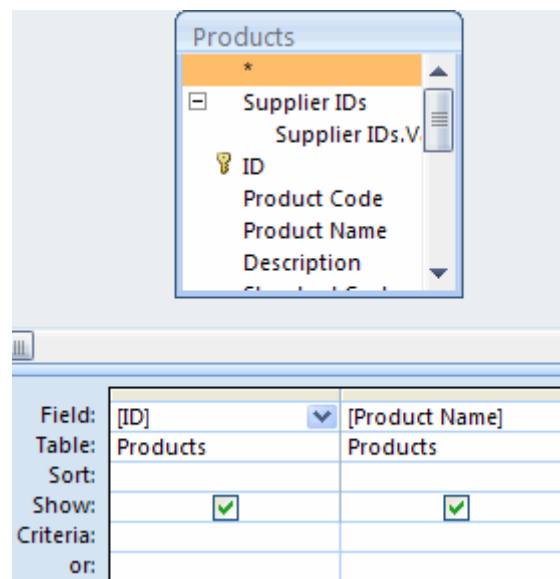
Field:	[Employee ID]	"Qtr " & Format([Order Date], "q")	[Order ID]	Total Of Order ID: [Order ID]
Table:	Orders		Orders	Orders
Total:	Group By	Group By	Count	Count
Crosstab:	Row Heading	Column Heading	Value	Row Heading
Sort:				
Criteria:				
or:				

Every crosstab query features a Crosstab row that states what part each field plays in the creation of the crosstab query. A special command has been entered into the second column, one that formats the Order date based on quarters. The column has also been given a new title; instead of being called Order Date it is now called 'Qtr'.

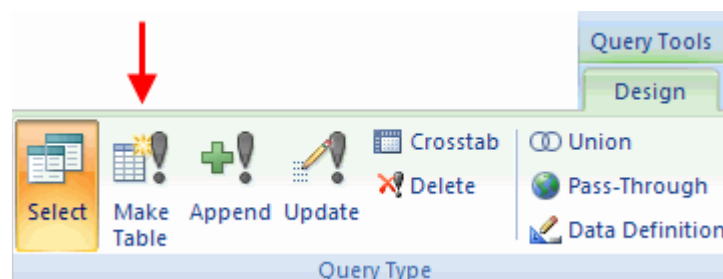
Using Make-Table Queries

When a query returns its results to Datasheet view, what does it look like? Datasheet view of a table, of course! Technically, every time a query returns results, they are stored in a temporary table in the memory of your computer. We need only to add a step to make the query results a table in the database with its own information that can be viewed and modified independently of the data that was used to retrieve it. This section of the lesson is our first introduction to action queries.

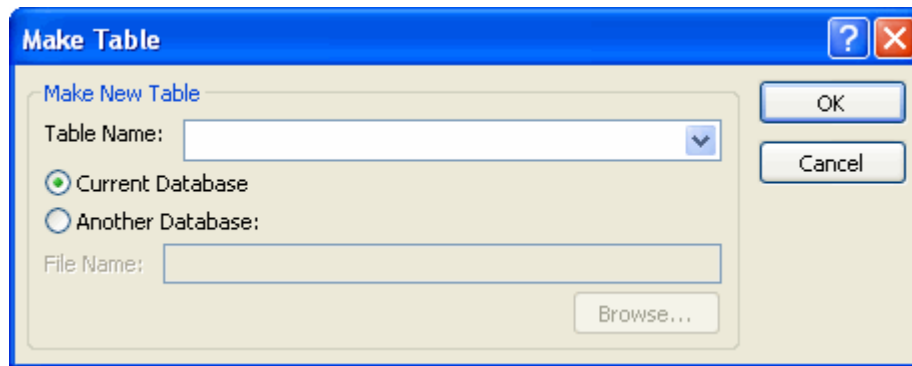
Imagine you are opening a new Northwind warehouse off site and want to make a table to send to the warehouse manager containing just the product ID and product name fields from the Products table. Create the query using whatever method you like and view it in Design view:



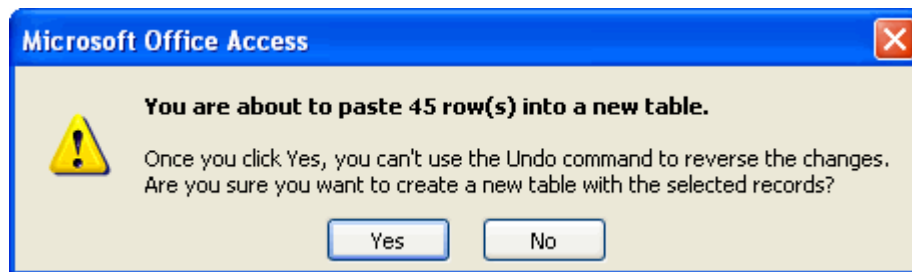
At the top of the Access window, you will see the Query Type section of the Query Tools - Design ribbon. Click the Make Table command:



The Make Table dialogue box will appear:

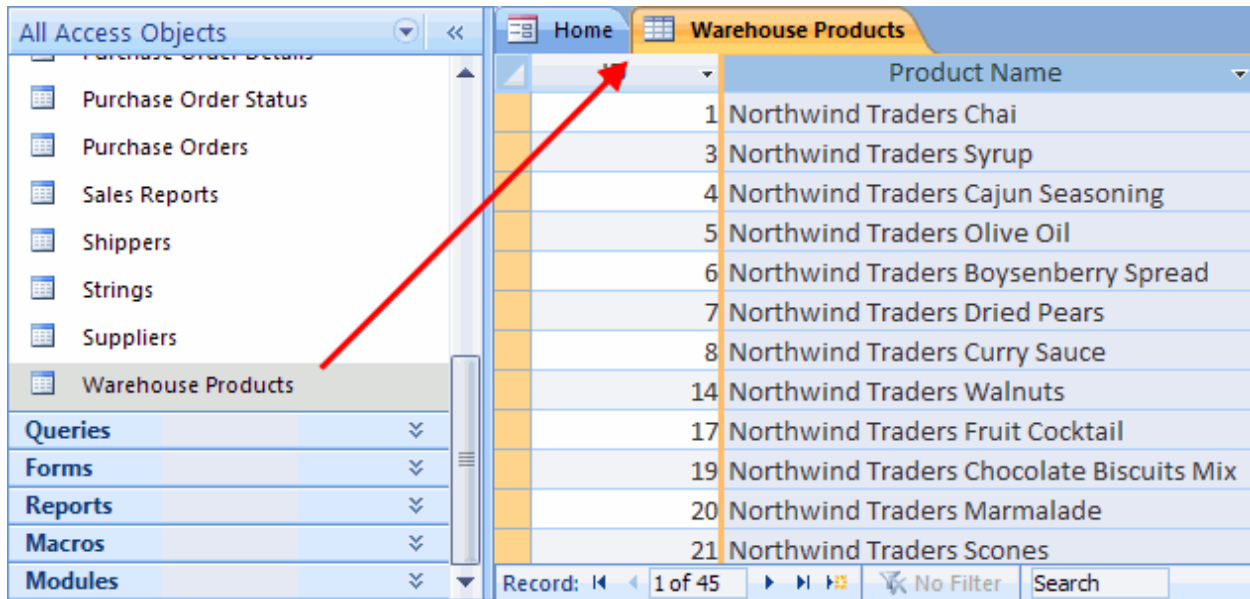


Give the table a new and meaningful name and specify where you would like it created. In order to save the table in another database, the database file must be stored on your computer (unless you have previously established the communication links necessary between your computer and another network). Click OK to confirm the details and then click the Run button:



Access informs you that you are about to create a new table and that the operation cannot be reversed. Click Yes to proceed.

Then, click the Tables object in the Database window to see the new table that was created from the query:



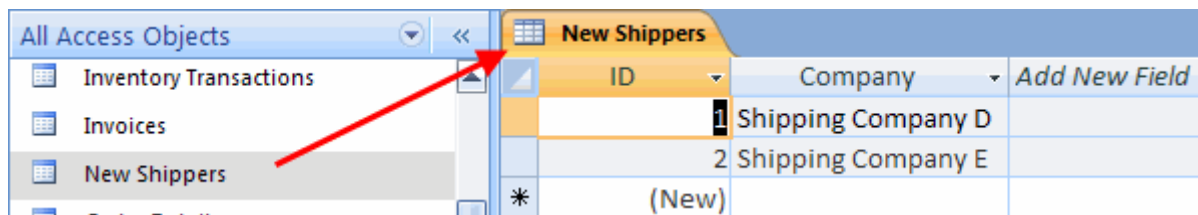
Management (Action) Queries

In this lesson we will explore the other action queries available for use in Access, like the Make Table query in the previous lesson. These queries actively seek out and modify data instead of merely searching for it. In this lesson we will introduce the functionality of each type of query.

Append Queries

As your organization and databases grow, you may need to add large amounts of data to a table quickly. One method of doing this is by using an Append query. For example, if we want to add more shippers to the list of available shippers Northwind uses, we can take the results of a query and add them to the fields of a particular table.

Let's assume that a new table was made in the Northwind database containing the information about two more delivery companies:

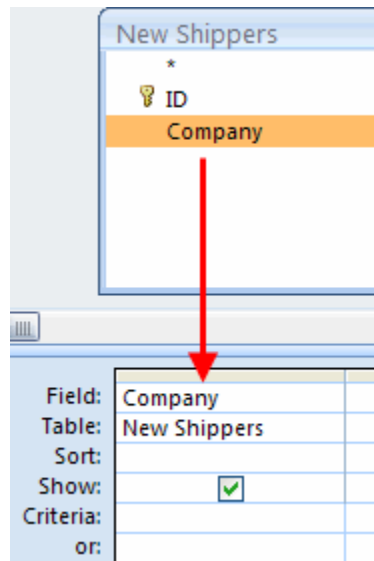


New Shippers	
ID	Company
1	Shipping Company D
2	Shipping Company E
*	(New)

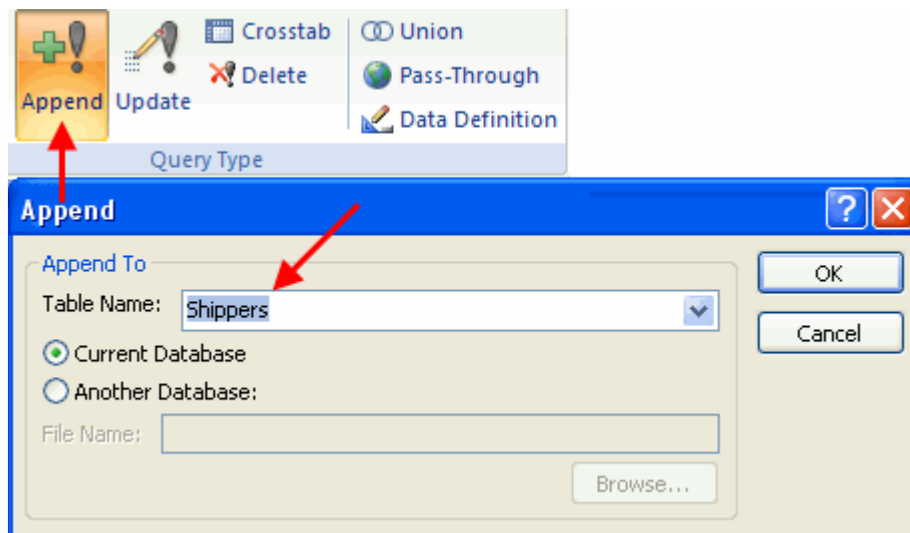
To add the data from this new table into the existing table, open a new query in Design view using New Shippers as the table data source.

Before we proceed with this lesson, it is important to note that both the New Shippers table and the (old) Shippers table have the same design and data types. Both tables have ID as an AutoNumber primary key, and some of the key values are duplicates. Since we cannot have duplicate primary keys, do not add the ID from the New Shippers table to the query. Access will take care of the primary keys itself because any new rows appended to a table with an AutoNumber primary key will be assigned a new unique value.

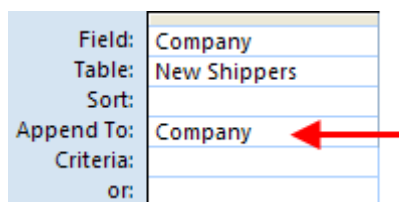
To start, click and drag the Company field to the Field cell of Design view:



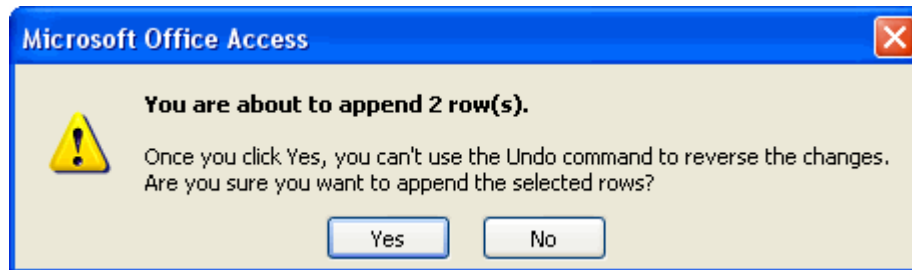
Click the Append command in the Query Type section of the Query Tools - Design ribbon. When the Append dialogue box appears, choose Shippers from the Table Name combo box:



The Show row in Design view will be replaced with the Append To: row, stating which field the query will add the information:



Click the Run button to execute this query, and then click Yes when prompted to confirm that you are about to append a number of rows to a table:



Open the Shippers table in Datasheet view to see the new entries:

A screenshot of the "Shippers" table in Microsoft Access Datasheet view. The table has two columns: "ID" and "Company". There are five rows of data. The first three rows are "1 Shipping Company A", "2 Shipping Company B", and "3 Shipping Company C". The last two rows, "4 Shipping Company D" and "5 Shipping Company E", are highlighted in blue. Red arrows point to the "ID" column of these two rows. At the bottom of the table, there is a row with an asterisk in the "ID" column and "#####" in the "Company" column.

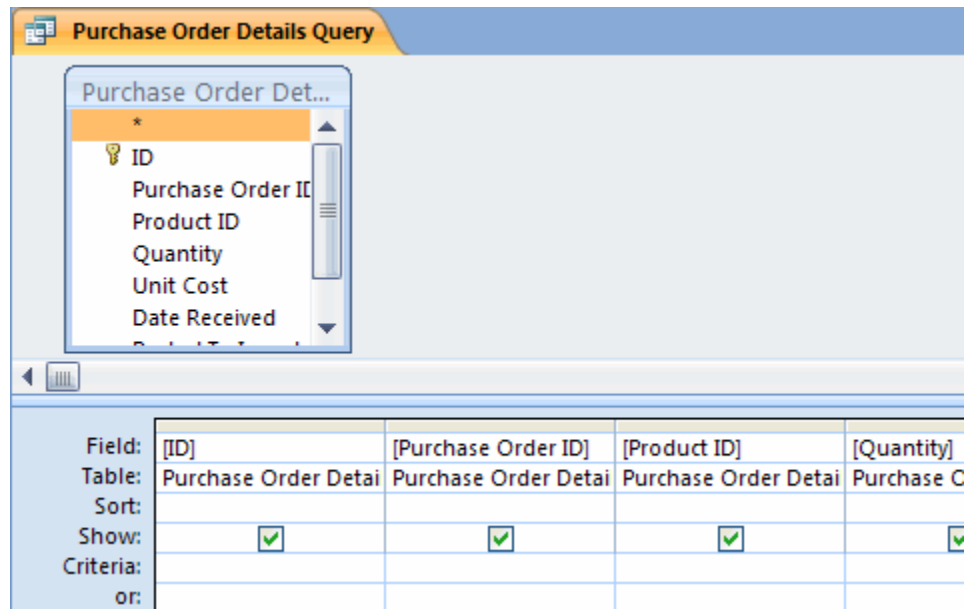
ID	Company
1	Shipping Company A
2	Shipping Company B
3	Shipping Company C
4	Shipping Company D
5	Shipping Company E
*	#####

Delete Queries

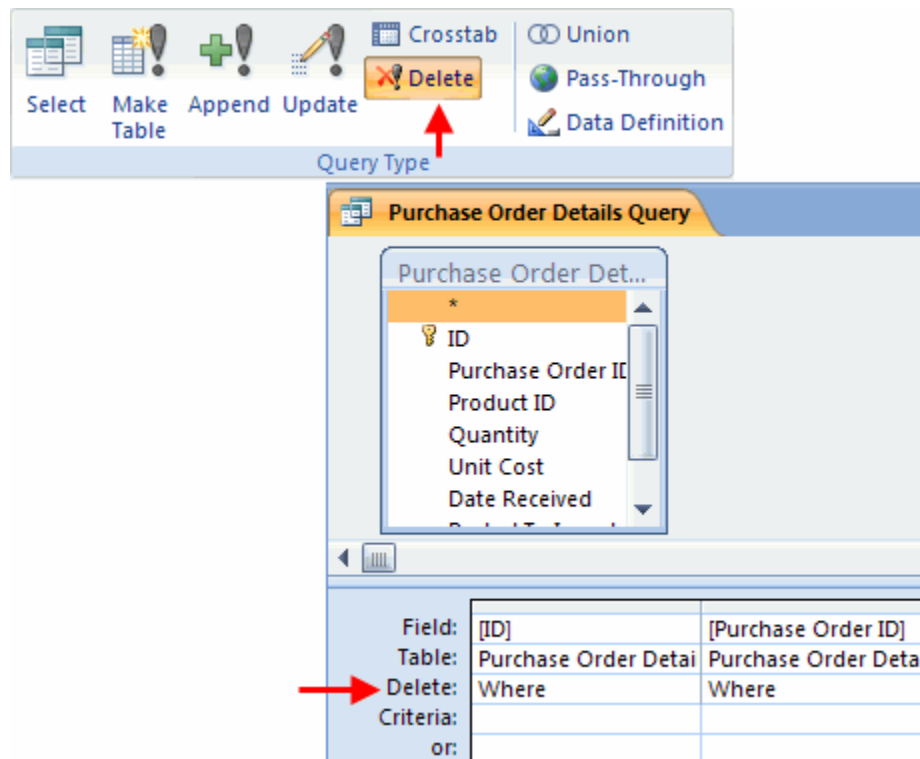
You guessed it – delete queries are used to remove useless or obsolete data from a table or tables. For example, if you want to decrease the size of your database and remove old records, use a delete query to remove a certain portion of the data from the database.

For example, imagine you want to remove all purchase order data from the month of January from the Northwind sample database. If we want to perform the deletion of old records, it is necessary in Access to create a query containing all fields from the source table. The easiest way to do this is to use the query Wizard, select the Purchase Order Details table from the combo box, click the (>>) button to include all table fields, and then click Finish.

First, open the query in Design view:



Click the Delete command in the ribbon to replace the Sort row with the Delete row:



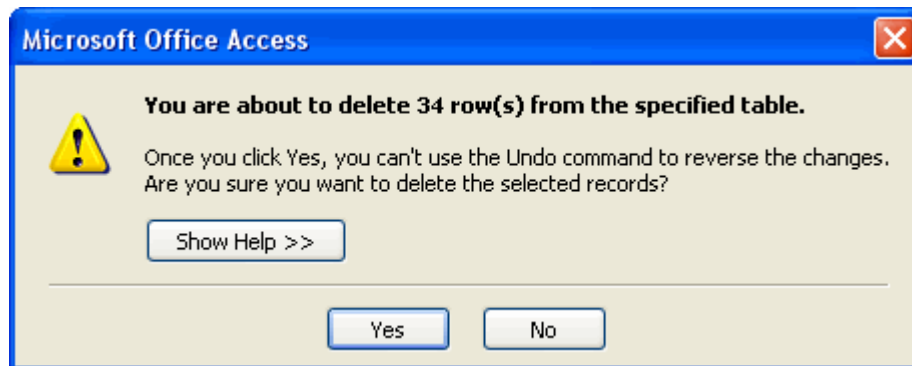
The Delete row contains two options, Where and From. The Where option (called a where clause) means “delete the current field from this table based on the criteria I enter.” The From

clause is only usable when you are constructing a Delete query based on the information from two or more tables. The From clause states “delete this field from this other table based on the criteria I enter.”

To remove the old PO information from this table prior to February, enter < 02/01/2006 in the Date Received criteria:

[Date Received]
Purchase Order Detail
Where
<#2/1/2006#

Click the Run button to execute the query:



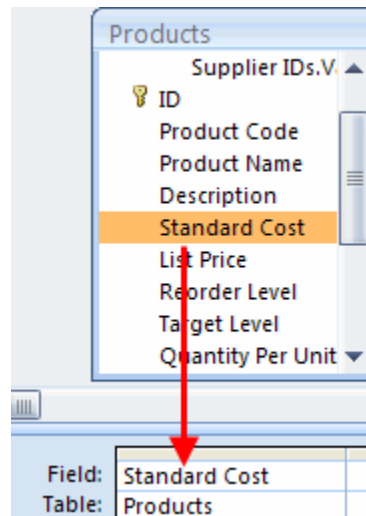
Access confirms that you are about to permanently delete information from a table; click Yes to confirm.

Update Queries

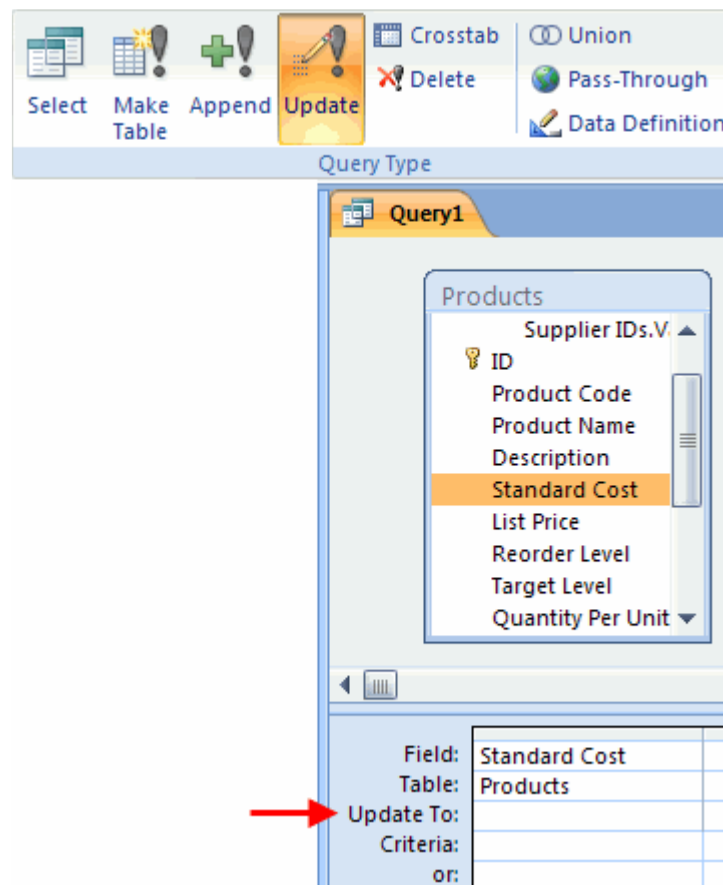
If you recall the calculated field from earlier in this manual, you know that you can enter some expression into a field of a query thusly creating a new field and a calculated value. An update query is similar in design, but instead of making a whole new column of calculated data, the query will perform the calculation directly on the table data.

To demonstrate this, we will perform a price increase of 5% to all products in the Products table.

Open a new query containing the Standard Cost field from the Products table in Design view:



Click the Update command in the ribbon. The Sort row listed above will change to the Update To: row:



Enter the criteria [Standard Cost] * 1.05 and then click the Run button. Access will warn you that you are about to update the data permanently to new values, click Yes to confirm. Open the Products table in Datasheet view to see the new prices:

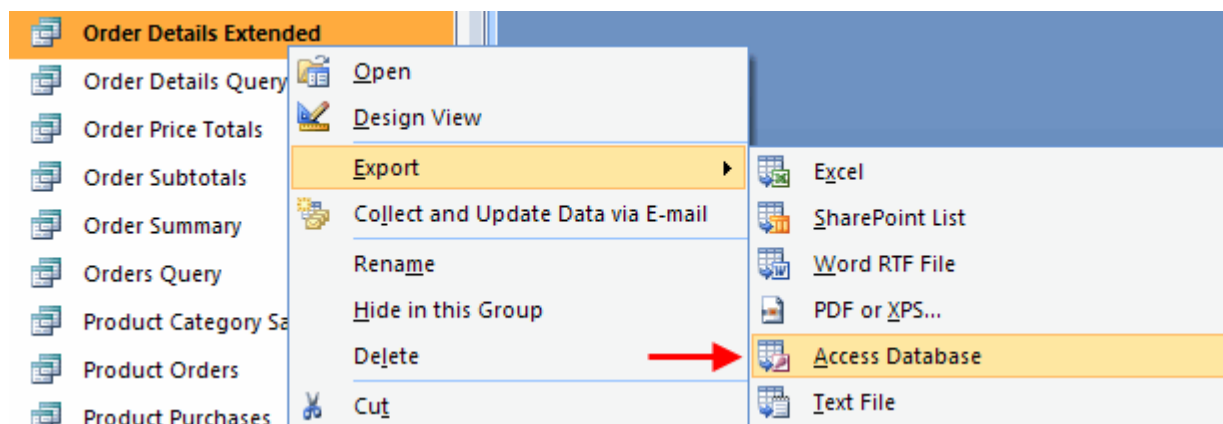
Standard Cost ▼
\$14.18
\$7.88
\$17.33
\$16.81
\$19.69
\$23.63
\$31.50
\$18.31

You can see that the prices have all been updated by five percent.

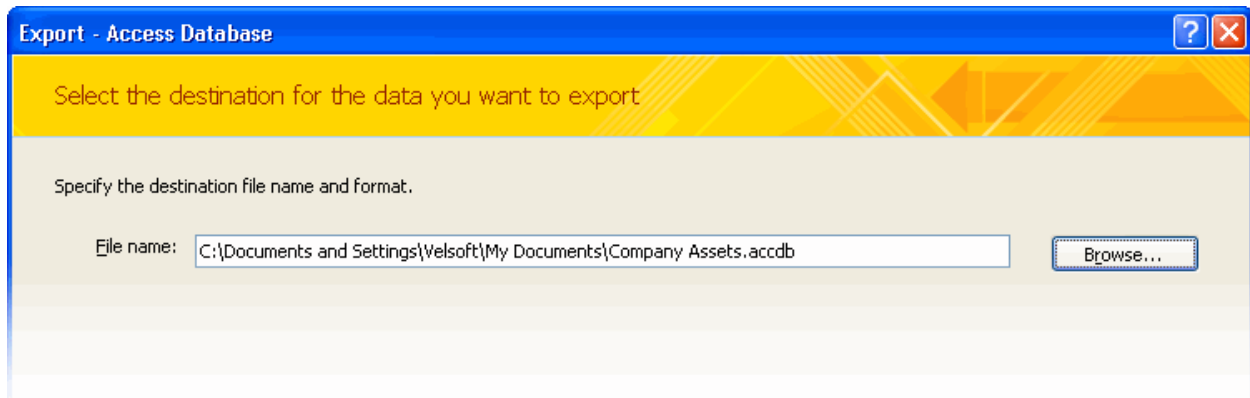
Exporting Queries

In the future, you may outgrow the database you are currently using, or open another location to provide the same type of services to your customers. If you share similar Access databases, and have spent a lot of time making the database look and work the way you want, you can export a query (or any database object).

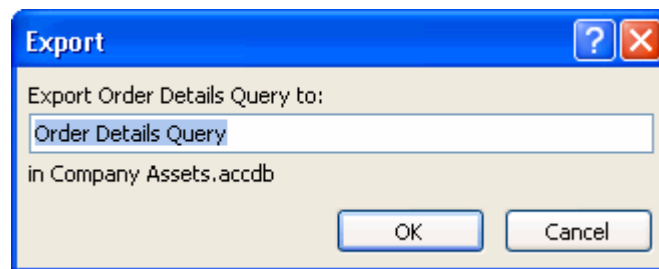
Simply right-click the query (or object) you want to export in the Navigation Pane, point to Export, and then click Access Database:



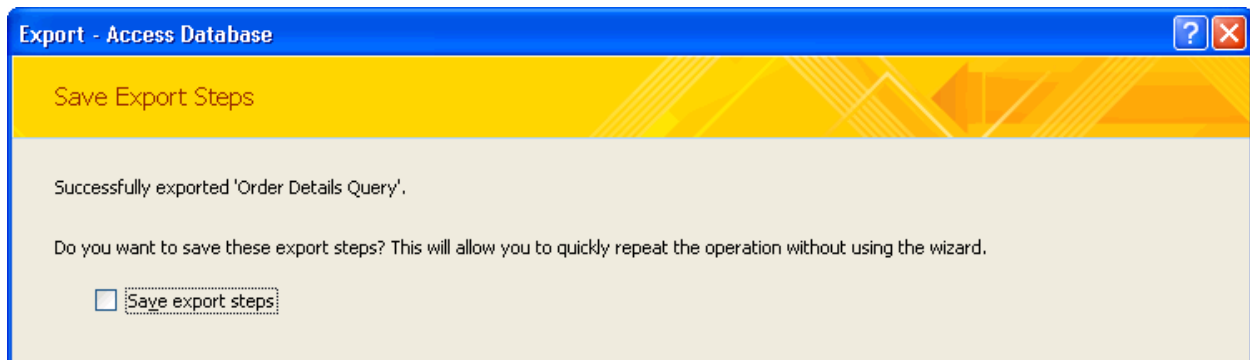
Access will ask you where you would like to export the file. You can export to a local file on your machine or on a remote database. Locate the destination file for your object and then click OK:



Access gives you the option to name the exported object; type a new name or leave the default name and then click OK:



Then, you can choose to save your export steps if you wish.



SECTION 6: Created Advanced Form Design

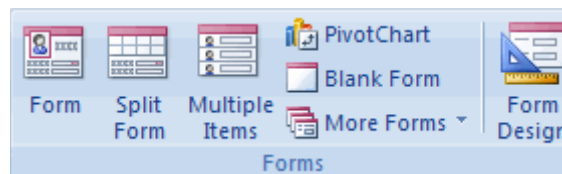
By now you should be very comfortable with creating and controlling data contained in the tables of your database. In the coming lessons, we will learn how to make the database more usable by using forms.

Forms in a database are just like paper forms: information is written on a form, and the information on the form is entered into a database or kept on file in some way for retrieval later. Access can make some very powerful and functional forms for use with your databases, so let's explore how they work.

Adding a Control

Forms have two basic functions: they provide a means to input data and they can perform actions on the database. Therefore, the things that you interact with on a form are either text fields where data is entered in some way, or controls that perform some action on the data in the form or on the database.

Every form includes some sort of control. In this lesson, we will explore some of the functionality provided by forms. Use the Create ribbon to view the Form commands:



Here is what the different commands do:

Form

This command is used to create a form based on a table in your database. Access will automatically create a form that contains all of the fields in the highlighted table.

Split Form

This command creates a form that contains two parts. The top part is just like datasheet view; you can see all records contained in the table or query upon which the form is based. The bottom section is a normal form.

Multiple Items

This command displays all the information in a table or query in a special datasheet view. This view allows you to see several records at a time, each displayed like a single form entry.

PivotChart

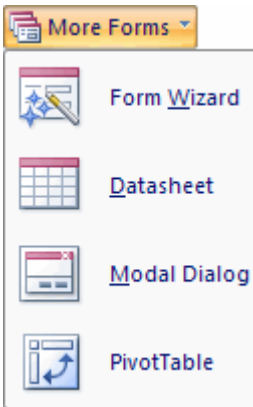
PivotCharts are used by Access as a way to quickly display information in a graphical way. Though they are beyond the scope of this manual, PivotCharts let you drag two or more fields to the axes of a chart. The numerical data contained in the fields will be displayed. The term 'pivot' means you can click and drag one or more fields from one axis to the other, therefore pivoting the data to display it in a different way.

Blank Form

This command creates a new empty form with a blank canvas.

More Forms


This command opens a small menu containing other commands relevant to the use of forms:



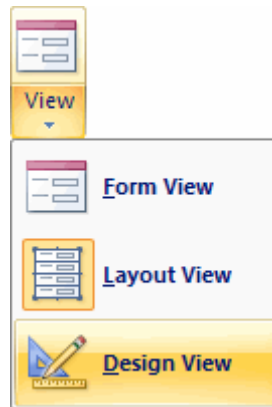
- Form Wizard walks you through the creation of a form. The end result is a complete working form that can be used right away.
- The Datasheet command creates a new empty form, but one that you can use to insert data like a table. Datasheet forms are beyond the scope of this manual.
- Modal dialogue allows you to create a new form that looks just like a dialogue box. Modal Dialogue forms also feature OK and Cancel buttons built in.
- PivotTables are a way to display numerical data quickly. Just like PivotCharts, fields can be moved from one axis to another to display information about your data in a different way.

Form Design

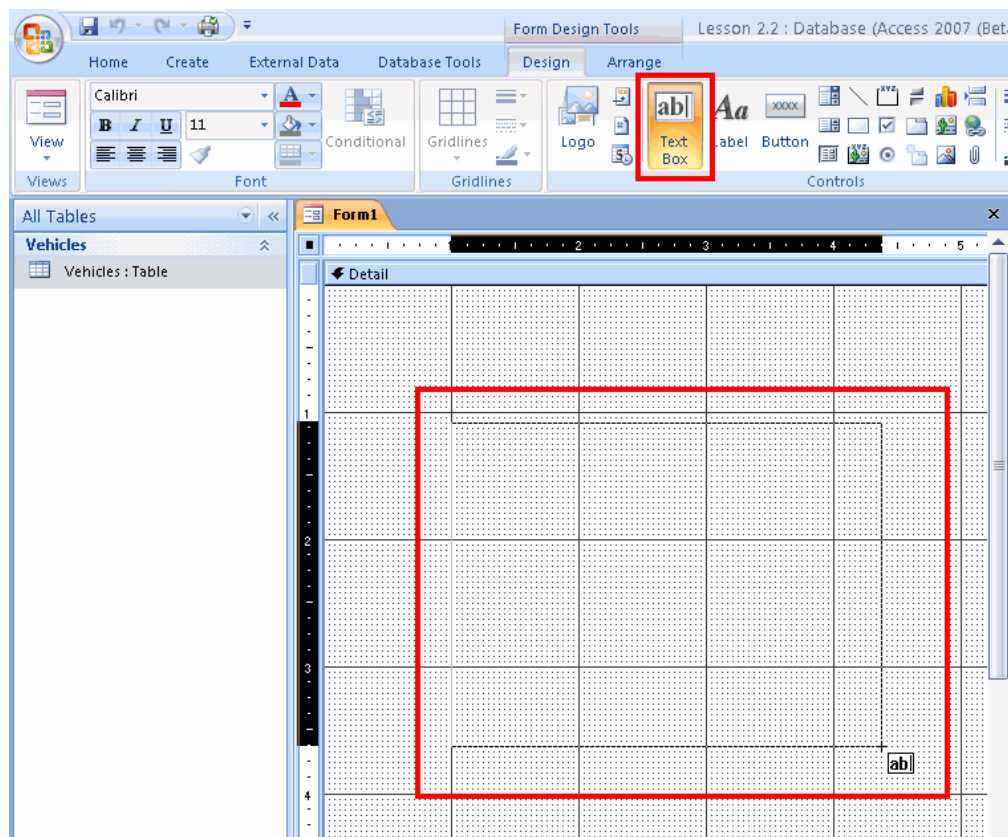
This command opens the currently selected form in Design view.

Let's add a control to a blank form. First, open a new blank form by clicking the Blank Form ( Blank Form) command in the Create ribbon.

Next, use the View menu in the Form Tools - Formatting or Home ribbon and switch to Design view:

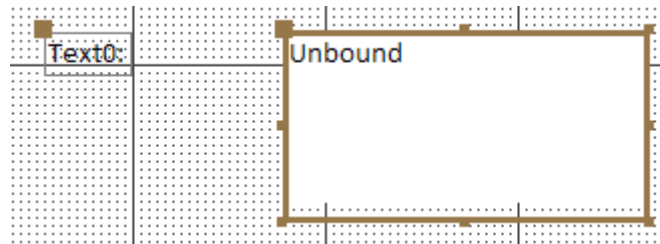


The majority of controls in Access can be added to a form in Access by clicking and dragging an area you want to designate for the control. For example, if you wanted to add a Text box to the empty form, click the text box command and then drag an area:



As you click and drag, you will see a certain area of the rulers turn black to indicate how large the control is. Don't worry about making the controls an exact size; every control can be moved

and resized later. The text box can now have text added to it, and the label beside the text box can be modified to describe what the text box is for:



Access 2007 features a wide range of commands that can be used in a form.



Many of the commands you can use are very similar to ones used in the Microsoft Windows operating system. Let's quickly look at what each icon does:

Logo



The logo command prompts you for an image file to use in the Form Header section of the Form. It will always be present at the beginning of the page.

Title

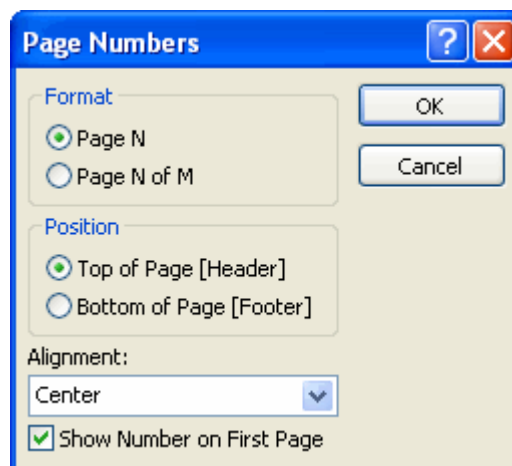


This command adds a title to the Form Header section.

Page Numbers

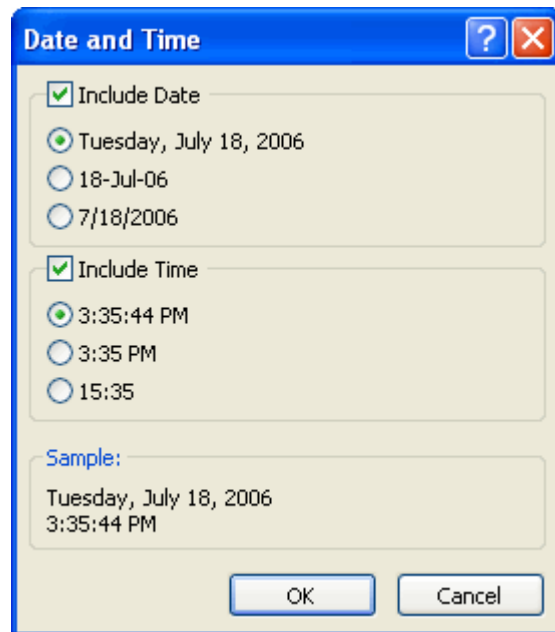
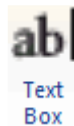


Click this command to show the Page Numbers dialogue box. Select the options and position you want to use for your form.



Date and Time

This command shows the Date and Time dialogue box. It allows you to select the formatting options you want for your form:

**Text Box**

Click this command and then click and drag an area on the canvas to add the text box. A text box can hold any type of data except graphical.

Label

Nearly every control has an associated label, one that tells you what the command is called. Click and drag an area in the canvas.

Button

A button is used to perform some sort of action, like the OK and Cancel buttons of a dialogue box. Click and drag the size of button you want.

Combo Box















You should be very familiar with the function of combo boxes by now. Use combo boxes to have the user pick an option out of a list of options by clicking the pull-down arrow.

List Box








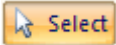


A box that works similar to a combo box, but it can be expanded to show all of its contents. A user simply picks the option out of the list they want to use.

**Subform/
Subreport**

Lets you create a form inside a form or a report inside a report.

Line		Click and drag to draw a line in the form. Useful for dividing up the form components into groups so they are easier to read.
Rectangle		Draw rectangles in the form to help provide a visual group of related components.
Bound Object Frame		Allows you to enter and control various expressions and low-level operations that can be performed on the database.
Option Group		Click and drag a box around a group of controls to group them together. Useful when using radio buttons; users can select one option out of the group to perform a certain action.
Check Box		When checked, the condition bound to the checkbox is true or active. When unchecked, the condition is false or inactive
Option (Radio) Button		Used to select a certain option, and almost always in groups of two or more.
Toggle Buttons		A toggle button's command stays in effect when clicked and will remain so until it is clicked again.
Tab Control		Lets you create a series of tabs in your form, each with its own options. Useful if you have a large numbers of controls in a frame that can be categorized.
Insert Page		Use this command to insert a page into a certain section of a form.
Insert Chart		Click and drag an area in the form to open the Chart Wizard. This Wizard will analyze the data contained in a query or report and display data for you in a graphical way.
Unbound Object Frame		Allows you to create a special window inside a frame that you can use to view some other document while looking at your form. For example, you could have a small window containing a PDF document or a PowerPoint presentation.
Image		Allows you to place a picture in your form.
Page Break		Used to create a cut-off point when printing a document. Even though you may be able to see everything on your screen, a new page will always print off when a page break is encountered.
Hyperlink		This command will create a link to another file, Web page, or

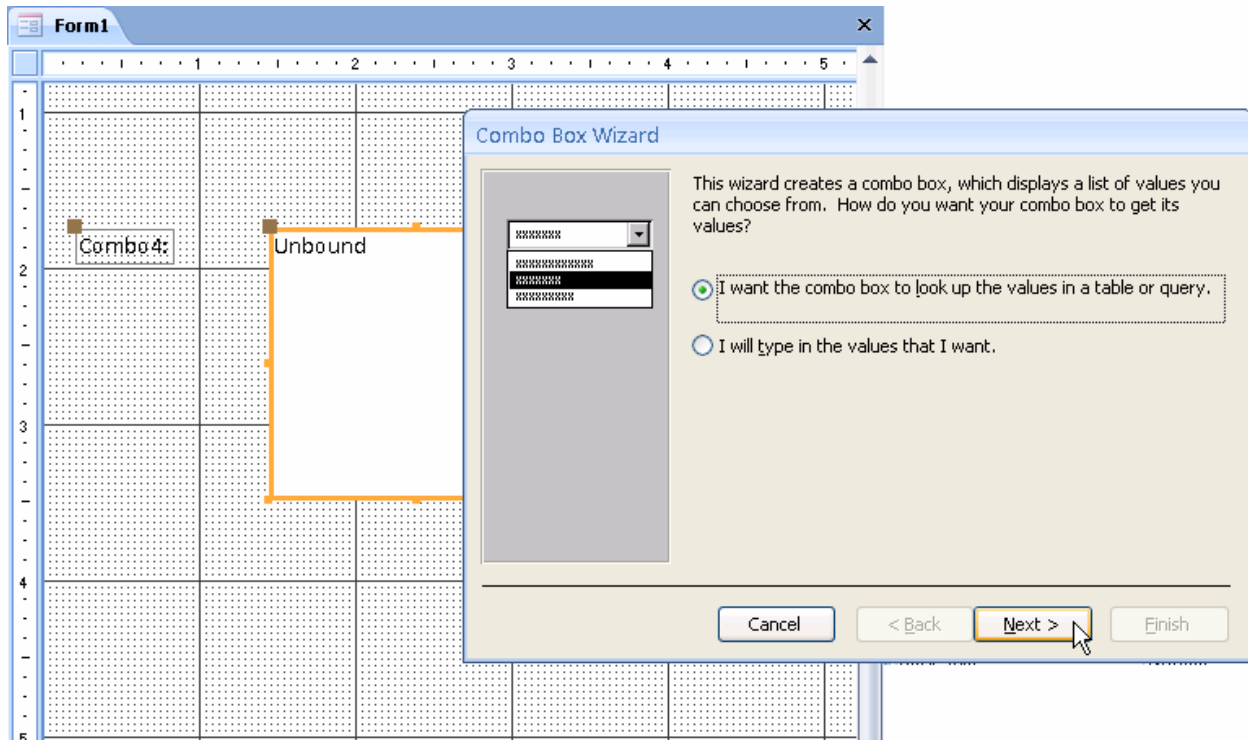
resource external to your database.

Attachment		Use this command to view non-alphanumeric data contained in your database.
Line Thickness		Choose the thickness of the line you have currently selected or are about to make.
Line Type		Choose a line pattern.
Line Color		Choose a line color.
Special Effect		You can apply a special effect to a button or other control to make it look like it is 3-D, flat, or sunken into the form.
Set Control Defaults		Use this command to revert a control's properties back to the default setting.
Select All		Use this command to select all controls contained in a form.
Select		This command lets you select a control so you can move it around the canvas.
Use Control Wizards		Toggle this command to have Access automatically start a Wizard to help with the creation of different commands in a form.
ActiveX Controls		ActiveX controls are special types of controls that are used to enhance the functionality of a form. They can be used as small toolbars or applications that execute from inside a form.

Using the Control Wizard

The Control Wizard option, when selected, will start the appropriate Wizard to guide you through setting up Option Groups, Combo Boxes, List Boxes, Command Buttons, Subforms, and Subreports. It is a good idea to leave this toggled (indicated as active when it is orange in color) to guide you through setting up a control until you reach a point where you are comfortable designing a control on your own.

When you click and drag the area you want to use for the control, the appropriate Wizard will begin:

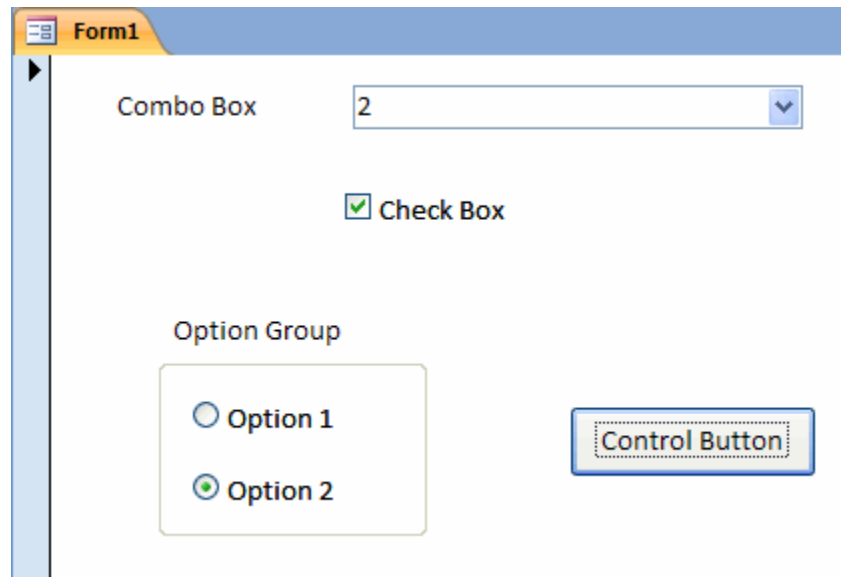


Follow the directions provided in the Wizard to format your control.

Cutting, Copying, Pasting, and Moving a Control

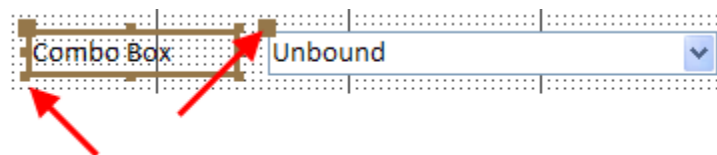
Thanks to the interactive and graphical control provided by most computer programs (including Microsoft Office) many objects can be cut, copied, pasted, and moved on your screen. When working with a form, Access lets you perform all of these options with your mouse.

Let's consider the following form, complete with a few basic controls:



You decide that this form is no longer completely serving your purposes and needs some adjusting. The combo box is not needed, so it can be cut. You will use another check box, so you can copy and paste the one you already have. And everything can be shifted up in the form to account for the loss of the combo box.

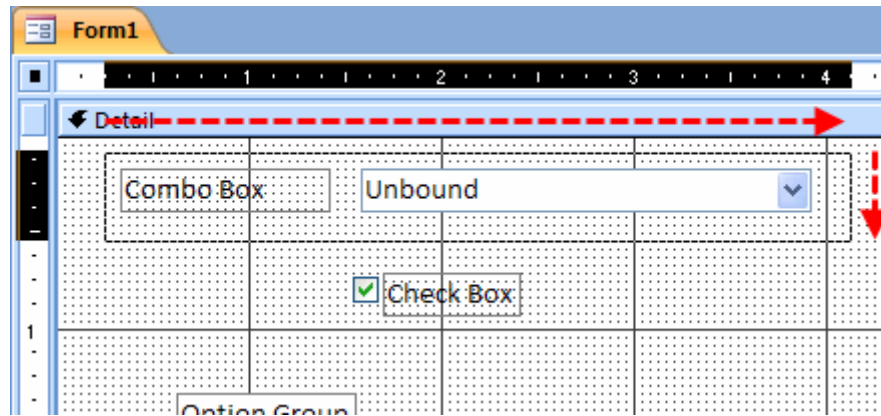
To perform these actions, open the form in Design view. When you click on a form, you will see the following handles appear:



In the diagram above, the label for the combo box was clicked to select it. The large brown box in the upper left-hand corner of the control is used to move the control, and the smaller boxes around the outside edge are used to expand the object in a certain dimension. Notice too how there is a large brown box in the upper left-hand corner of the combo box itself; this means that the combo box is related to the label that is currently selected.

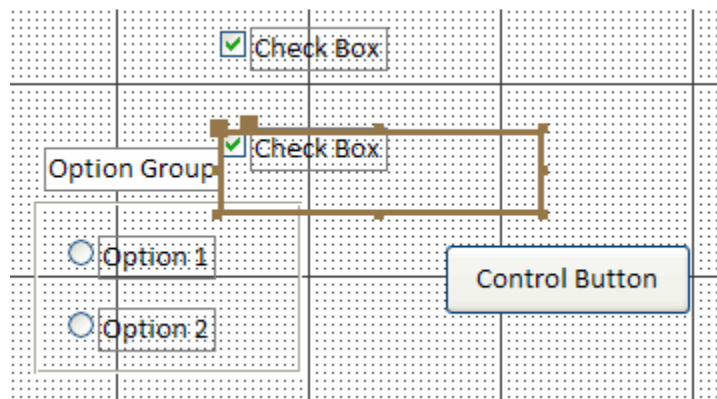
To cut the control when selected, press Ctrl + X on your keyboard. The label disappears and is placed in the clipboard of the computer, but the combo box itself stays behind. This might be useful in some scenarios to have only the combo box visible, but for this example we want to remove the entire combo box and label.

Press Ctrl + Z to undo the Cut operation, and instead click and drag a selection box around the controls:



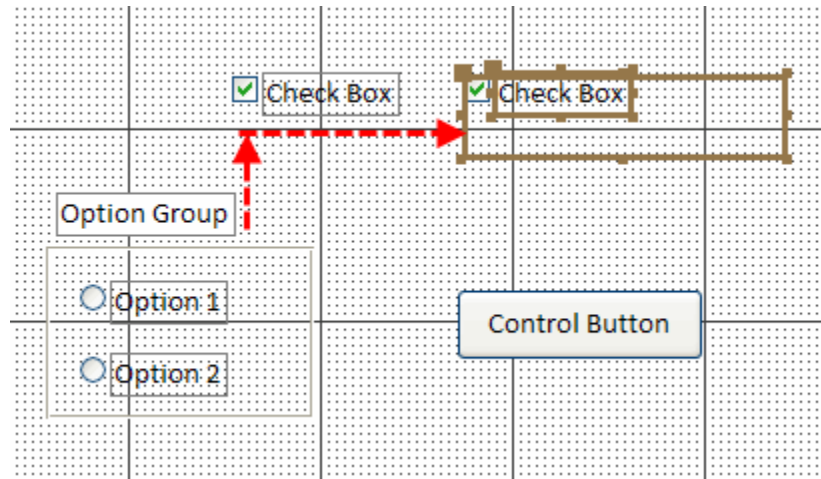
Now press Ctrl + X to cut the control. If you are planning on removing the combo box for good, you might consider just deleting it instead; simply highlight the object(s) and press Delete on your keyboard.

Click and drag a box around the Check Box and its label, and then press Ctrl + C. This stores a copy of the control in the clipboard of the computer. Now press Ctrl + V to paste the copied check box:

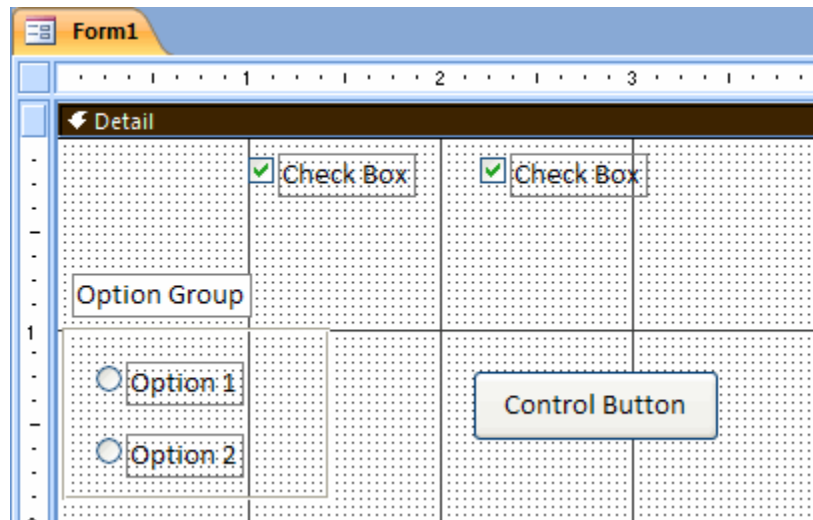


The new check box is pasted, but doesn't look very good when pasted on top of another control!

Use the arrow keys on your keyboard to move the control up and to the right of the first check box:

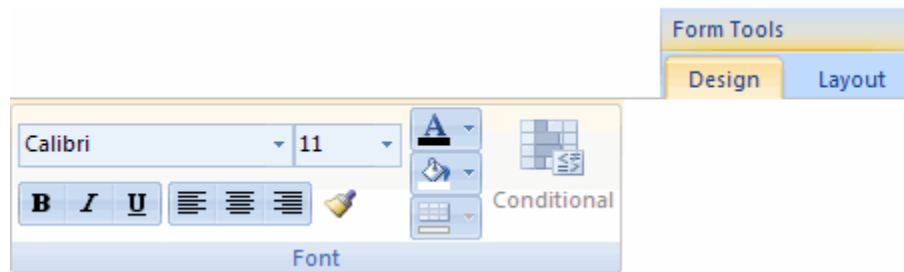


Now all of the controls in the form can be moved up to occupy the space left behind by the combo box. Click and drag a selection box around all of the controls, and then use the up arrow on your keyboard to shift all of the controls to the top of the form:



Formatting a Control

The default style of form may be functional but not very good looking. You can enhance the look of a control by using the Font section of the Form Tools - Design ribbon (or the Font section of the Home ribbon). If you are familiar with Microsoft Word or Excel, or other such software applications, this toolbar should look familiar:



Here you can adjust the font, font size, make the font bold, change the color, or apply a background color. If you apply a new format to a control and don't like the look of it, you can press Ctrl + Z on your keyboard to undo the formatting change. Also, if you make a font larger but can't see the entire label, click the label you just modified and drag the small brown boxes around the outside edge in the dimension you need to expand.

Advanced Form Controls

In the last lesson we learned that adding controls and formatting them is easy to do. Now we will introduce how to make the forms work for you by making controls interact with each other and your database.

Modifying a Control's Properties

Let's examine one of the forms that is already constructed in the Northwind sample database, the Employee Details form:

The screenshot shows the 'Employee Details' form for Nancy Freehafer. The form has a title bar with the text 'Employee Details'. Below the title bar is a header section with a logo and the name 'Nancy Freehafer'. The header also contains a 'Go to' dropdown menu, 'E-mail', 'Create Outlook Contact', 'Save and New', and 'Close' buttons. The main body of the form is divided into two tabs: 'General' and 'Orders'. The 'General' tab is active and contains several sections: 'First Name' (Nancy), 'Last Name' (Freehafer), 'Company' (Northwind Traders), 'Job Title' (Sales Representative), 'Phone Numbers' (Business Phone: (123)456-7890, Home Phone: (123)456-7890, Mobile Phone: , Fax Number: (123)456-7890), 'Address' (Street: 123 Any Street, City: Any City, State/Province: WA, Zip/Postal Code: 99999, Country/Region: USA), and a 'Notes' field. The 'Orders' tab is also visible. At the bottom of the form is a status bar with 'Record: 2 of 9', 'No Filter', and a 'Search' button.

This form is designed to show the details of each employee. It features a combo box that allows you to switch between employees, a logo, a title, many text fields, and an attachment field (the picture).

This form is based upon the Employees table in the sample database:

ID	Company	First Name	Last Name	E-mail Address	Job Title
1	Northwind Traders	Nancy	Freehafer	nancy@northwindtrader	Sales Representative
2	Northwind Traders	Andrew	Cencini	andrew@northwindtrad	Vice President, Sales
3	Northwind Traders	Jan	Kotas	jan@northwindtraders.c	Sales Representative
4	Northwind Traders	Mariya	Sergienko	mariya@northwindtrade	Sales Representative
5	Northwind Traders	Steven	Thorpe	steven@northwindtrade	Sales Manager
6	Northwind Traders	Michael	Neipper	michael@northwindtrad	Sales Representative
7	Northwind Traders	Robert	Zare	robert@northwindtrader	Sales Representative
8	Northwind Traders	Laura	Giussani	laura@northwindtraders	Sales Coordinator
9	Northwind Traders	Anne	Hellung-Larse	anne@northwindtraders	Sales Representative

Employee Details

Nancy Freehafer

Go to: [Dropdown] E-mail Create Outlook Contact Save and New

General Orders

First Name: Nancy
 Last Name: Freehafer
 Company: Northwind Traders
 Job Title: Sales Representative

E-mail: nancy@northwindtrader
 Web Page: http://northwindtrader

To see how the form is constructed and to modify properties of the form, open the form in Design view:

Employee Details

Form Header

=Nz([Employee Name], "Untitled") =If([DCount("","Employees")], " ", " ")

Go to: Unbound E-mail Create Outlook Contact Save and New Close

Detail

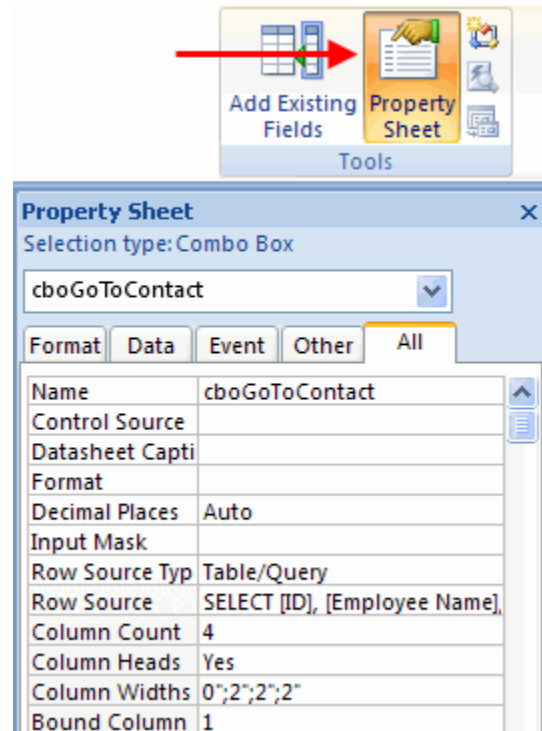
General Orders

First Name: First Name
 Last Name: Last Name
 Company: Company
 Job Title: Job Title

Attachment s

E-mail: E-mail Address
 Web Page: Web Page

The combo box in the upper left-hand corner is used to switch from one employee to another. Click the combo box (not the Go to label) and then click the Property Sheet command in the Form Tools - Design ribbon. The Property Sheet pane will appear on the right-hand side of the screen:

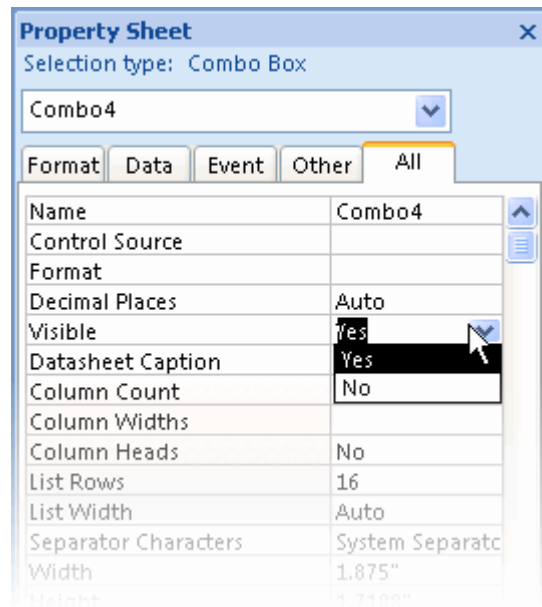


There is no shortage of properties to modify for a control (in fact there are 102 different properties you can modify for a combo box!). We will cover how to modify some of these properties as we continue with this lesson.

At the top of the Property Sheet is a combo box you can use to select a control from the list of controls in the current form. The Property Sheet also features some tabs at the top of the sheet to break down the list of commands into categorized pieces:

- | | |
|-------------------|---|
| Format Tab | Controls how an object will look. |
| Data Tab | Perform data modifications, including adding a validation rule, making a default value, and modifying the control source. |
| Event Tab | Controls what a particular object will do when you interact with it (click it, move the mouse over it, etc.). |
| Other Tab | Alternate controls like allowing AutoCorrect and adjusting the tab order. |
| All Tab | All controls combined. |

You can modify the values in the Properties dialogue box by entering a value directly, picking a Yes or No option, or selecting an option from a combo box.

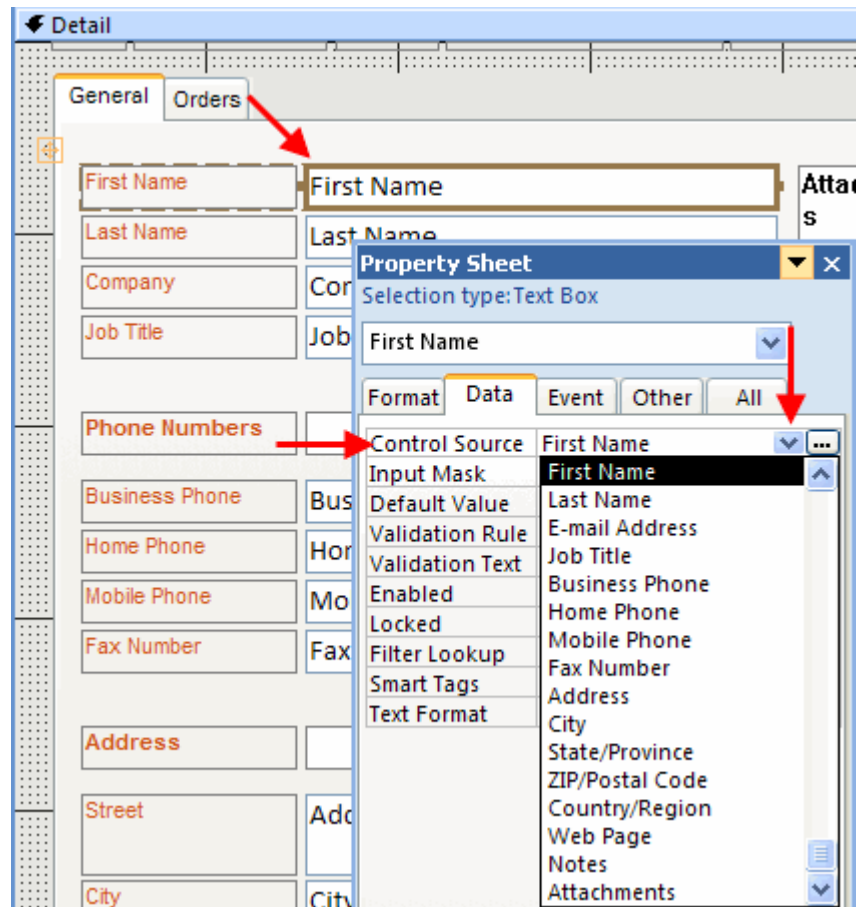



Changing a Control's Data Source

The vast majority of forms are built on the data from a single table. In the case of the Employee Details form, shown in the previous section of this lesson, the form is constructed from all the data contained in the Employees table. Each text field corresponds to one field in the table.

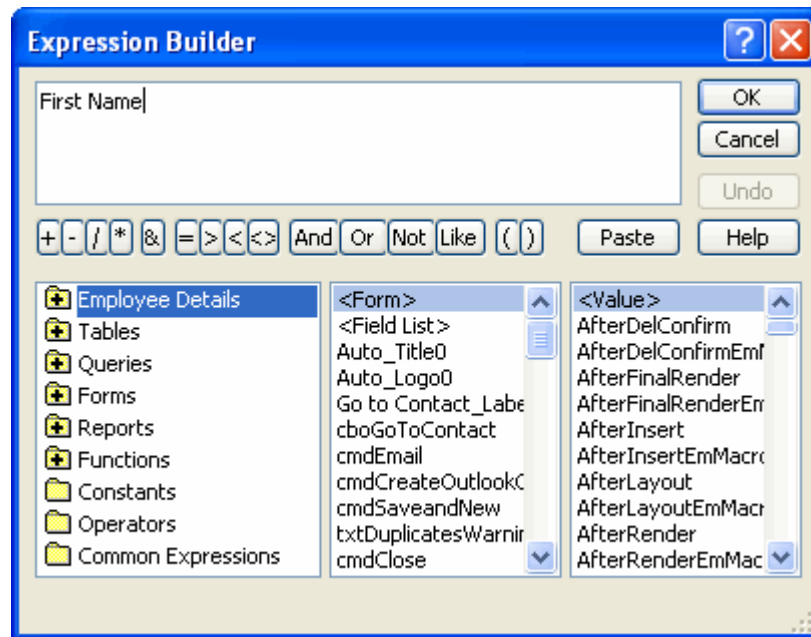
Access makes it very easy to change the control source of an object. First, open the form in Design view, click the object that you want to change the data source, and click the Property Sheet command in the ribbon. When the Property Sheet pane appears, click the Data tab.

Then, adjust the Control Source field by using the combo box:



As the form is created from a single table, all of the available fields in that table are listed in the combo box. The First Name control in the form is based on the First Name field in the table. However, you are not limited to using the fields in one table. If you want to add the values from some other database object, click the  button.

This will open the Expression Builder dialogue box:



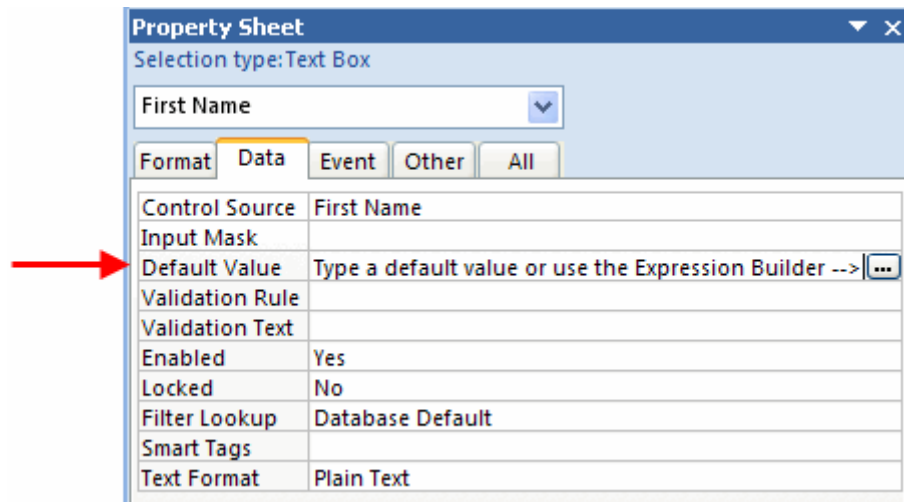
The Expression Builder lets you do a number of things. You can construct logical expressions, extract information from queries, and create calculations. In the diagram above, the new control source would be the first name of an employee. This application doesn't make much sense, but the Expression Builder makes it easy to change the control source with only a few clicks. We will explore the use of the Expression Builder later in this manual.

Changing a Control's Default Value

You may recall the term "default value" used earlier in this manual when we discussed tables in depth. A default value is one that will be automatically filled in until it is changed to something else.

Adding or modifying a default value for a form is no different from changing the control's data source. First, open a form in Design view and then open the properties of a particular object.

The Default Value field is located under the Data tab:



Enter a default value for the field or use the Expression Builder to pick another value from a table, query, or some other database object.

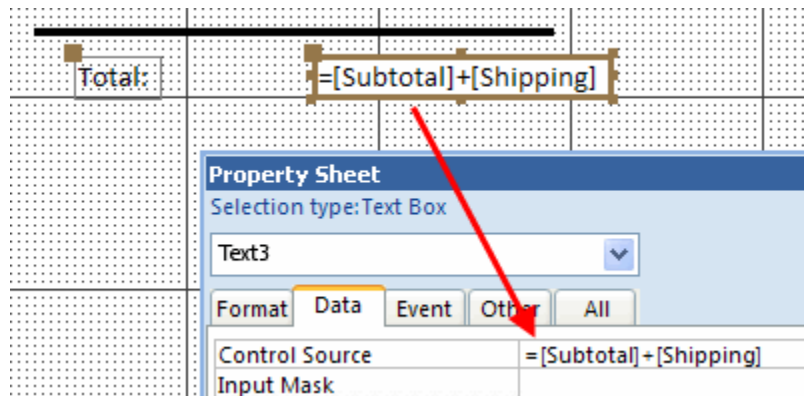
Creating a Calculated Control

A calculate control is an object in a form that performs some sort of calculation based on data in the form or data extracted from another source. Virtually every control can be made into a calculated control. Consider the following example:

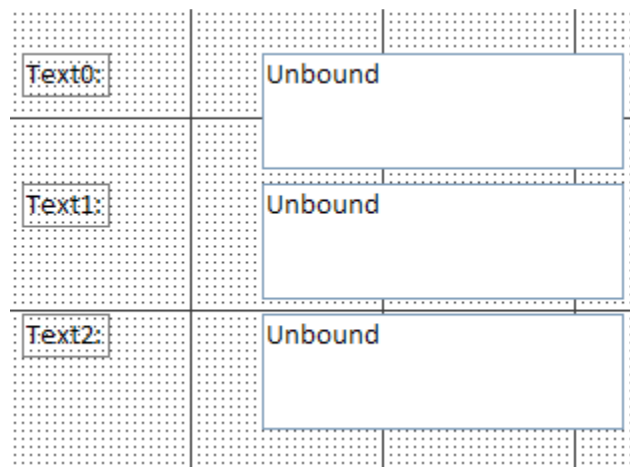
Subtotal:	<input type="text" value="499.99"/>
Shipping:	<input type="text" value="35.88"/>
<hr/>	
Total:	<input type="text" value="535.87"/>

This form takes the values from the Subtotal and Shipping text boxes and adds them together in the Total text box.

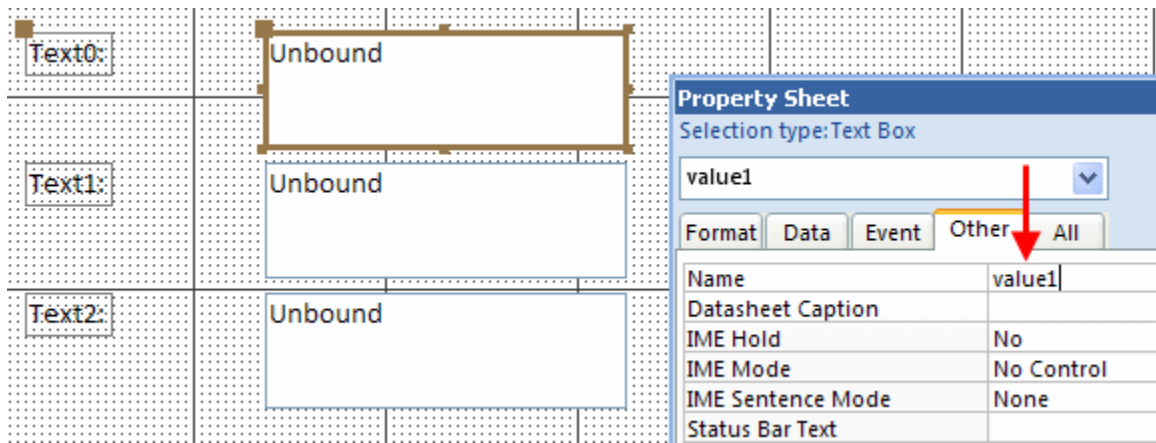
More specifically, the Total text box contains a mathematical expression as the Control Source property.



The Control Source field has a simple expression that adds the Subtotal and Shipping fields together and displays the result. Let's use this knowledge to make a basic (and completely impractical!) calculator using Access. We will make a new form in Design view, and then add three text boxes:



Open the Property Sheet for the first text field and click the Other tab. Enter value1 as its Name.



Repeat for the second and third text boxes, naming them value2 and total respectively. Now, change the Format of each text box to General Number (in the Format Tab). Click the Data tab for the total text box and enter `=[value1]+[value2]` into the Control Source field.

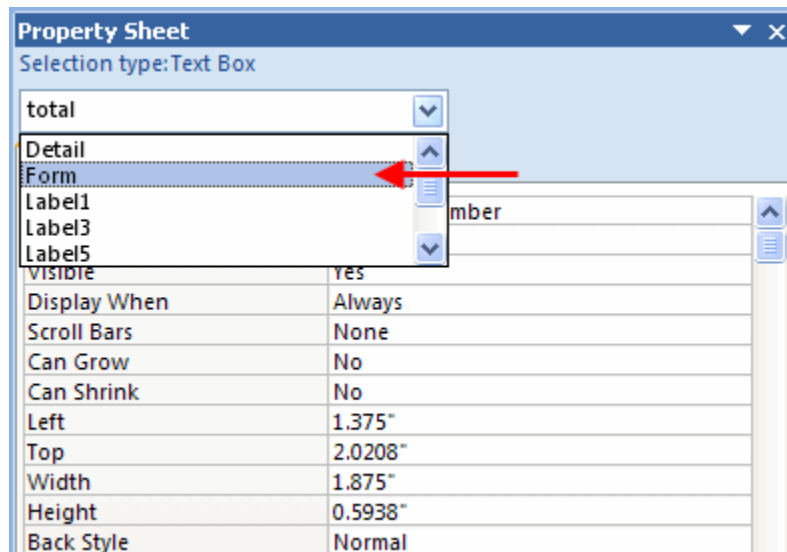
Now that the calculator is set up, switch back to Form view and enter some numbers:

Text0:	<input type="text" value="5"/>
Text1:	<input type="text" value="8"/>
Text2:	<input type="text" value="13"/>

A red arrow points to the value 13 in the Text2 field.

Using Form Properties

In Form Design view, we know that clicking the Property Sheet command will display the properties for a selected object. The combo box at the top of the sheet lets you view the properties of each active object in the form, as well as the Form itself:



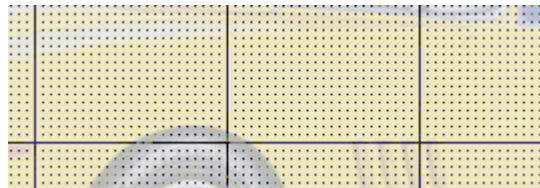
There are almost 120 properties that can be modified in a form. The majority of the properties you can modify go beyond the scope of this manual, but Access offers many examples of different settings in its help file. Be it a table, form, query, or report property, when your cursor is inside a property box, press F1 on the keyboard to read details about that specific property and how it relates to the parent object.

Formatting Your Form

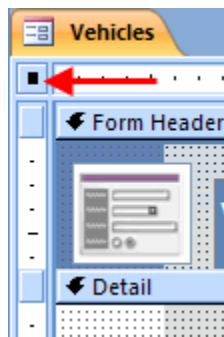
We have seen how to adjust the properties of the controls in a form. In this lesson we will explore a few more useful options and customizable features of forms.

Formatting Gridlines

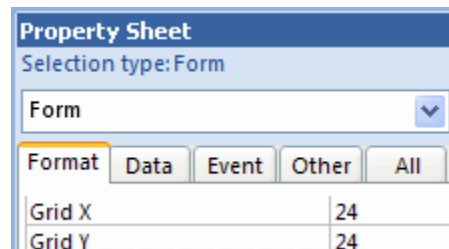
If you have tried to move a control using your mouse, you have no doubt become a little frustrated trying to get everything lined up neatly. Fortunately, Access gives you the ability to use the grid layout that is visible in form Design view:



The solid black lines are defined as a 1" grid. You can modify the resolution of the dot matrix visible in Design view. To modify this setting, open the Property Sheet for the form or double-click the form selector button while in Design view:

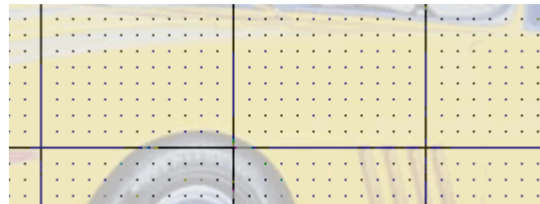


Click the Format tab in the Properties window and scroll down until you can see the Grid X and Grid Y properties:

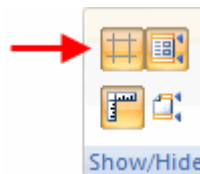


The numbers in each field denote how much you can subdivide the 1" square grid visible in Design view. The default value is 24, meaning that the space between the dots is 1/24th of an inch. You can adjust these properties from 1 to 64. Both values can be adjusted independently, though it is a good idea to keep both values either the same or multiples of each other.

Changing the values to 12 for each field decreases the resolution by half:

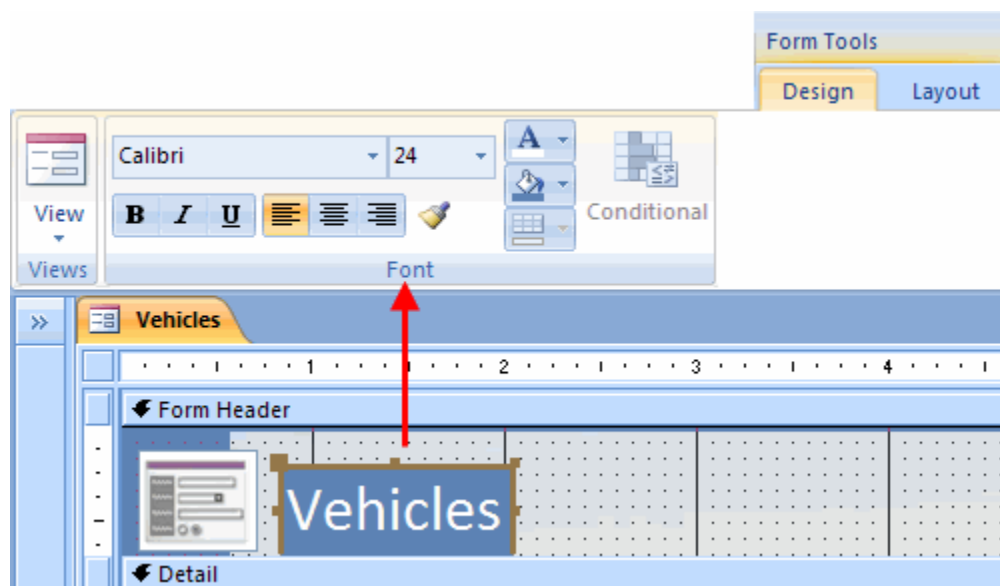


If you want to turn off the gridlines completely, click the Show Grid command in the Form Tools - Arrange ribbon:



Modifying the Font

Fonts can easily be changed at any time in either Design or Layout view. Simply click the form object you want to modify and use the Font section of the Form Tools - Design ribbon:



You can change the font, size, style, orientation, and color with these commands. But imagine you have a very large form with several fields you want to modify at once, such as the Employee Details form:

Employee Details

Andrew Cencini

Go to [dropdown] E-mail Create Outlook Contact Save

General Orders

First Name Andrew

Last Name Cencini

Company Northwind Traders

Job Title Vice President, Sales

Phone Numbers

Business Phone (123)456-7890

Home Phone (123)456-7890

Mobile Phone

Fax Number (123)456-7890


Apply the formatting you wish to use for the form to a single control in Design view:

First Name First Name

Last Name Last Name

Company Company

Job Title Job Title

Double-click the Format Painter () command in the Font section of the ribbon. Now click every control that you want to look the same:

First Name	First Name
Last Name	Last Name
Company	Company
Job Title	Job Title
Phone Numbers	
Business Phone	Business Phone
Home Phone	Home Phone

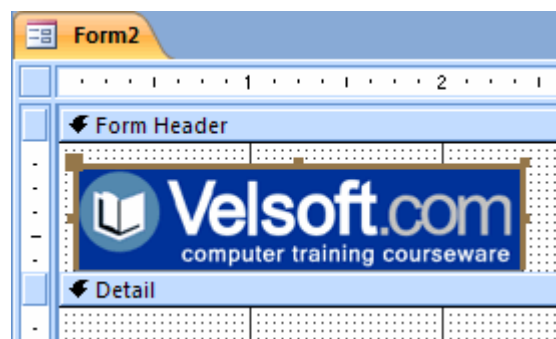
When you have finished using the Format Painter, click the command once more to stop using it. If you only want to use the Format Painter once, click one object (and modify it to your liking), click the Format Painter command once, and then click another object. This will copy the formatting from one object to another and then deselect the Format Painter.

Adding Logos

Though previous versions of Access allowed you to create a logo in a Form header automatically, Access 2007 contains a ready-made logo command in the Form Tools - Design ribbon.

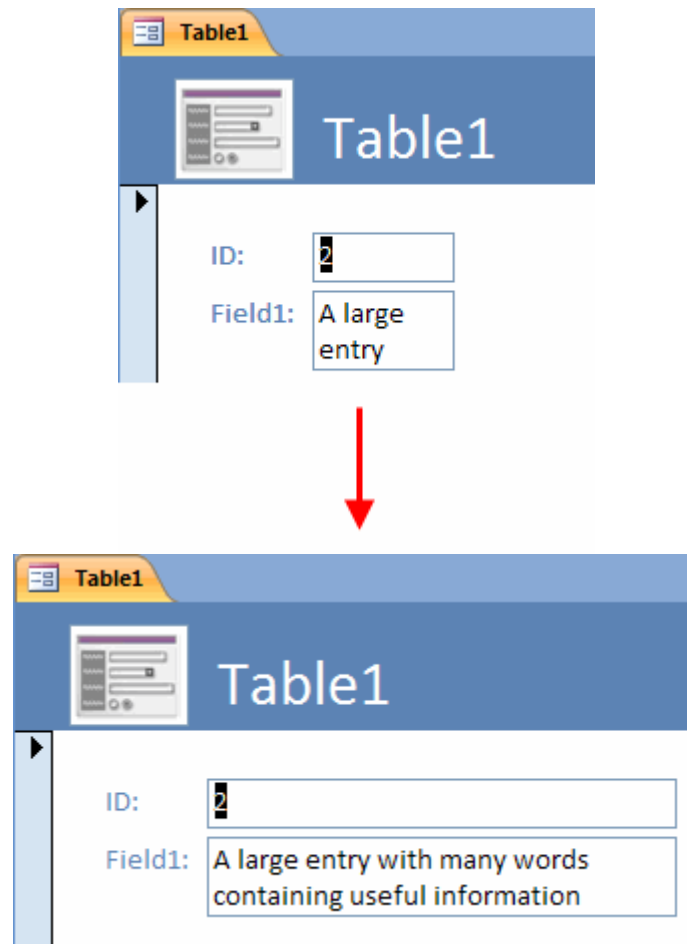


Click the command to open the Insert Picture dialogue box. Navigate to the picture file you wish to use as the logo. Access automatically expands the Form Header section of the form and inserts the picture for you:

A screenshot of the Microsoft Access 2007 interface showing a form named "Form2". The form has a header section and a detail section. The header section is expanded and contains a logo for "Velsoft.com" with the text "computer training courseware" below it. The detail section is currently empty.

Changing the Layout

When designing a form, Access gives you two modes to use. We are already familiar with Design view; it allows you to adjust every underlying aspect of your form. Layout view, which is new to Access 2007, lets you modify how the form will look while viewing data contained in the form at the same time. For example, if you have a text field that possibly contains a long entry, use Layout view to view the data and then adjust the size of the text box accordingly:



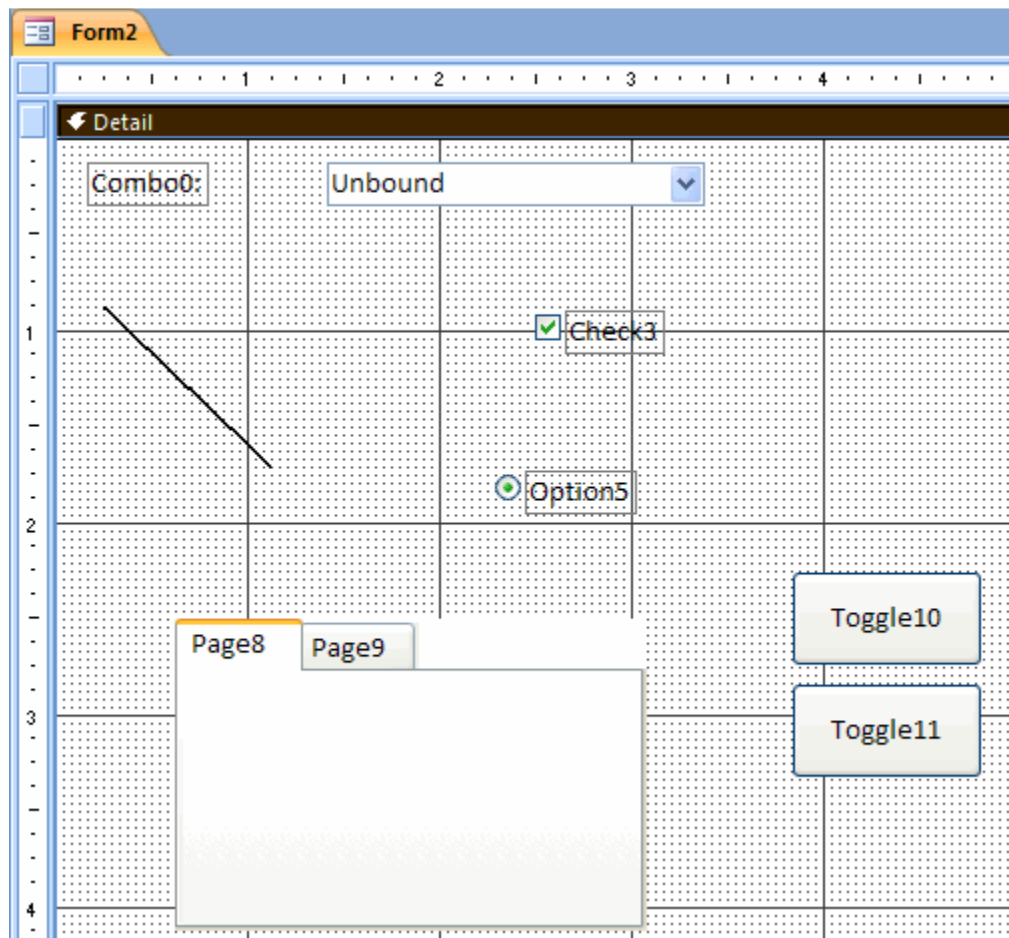
Using Layout view, along with other techniques such as changing the resolution of the formatting grid, lets you create a form exactly to your liking. If you don't like a certain change you made, press Ctrl + Z on your keyboard to undo the operation.

Formatting Controls

In this lesson we will cover a few more commands that are available when working with a form.

Changing the Color of a Control

The look and feel of nearly every control can be modified in some way by making use of the Form Tools - Design ribbon. Consider the following form, complete with a few different controls:

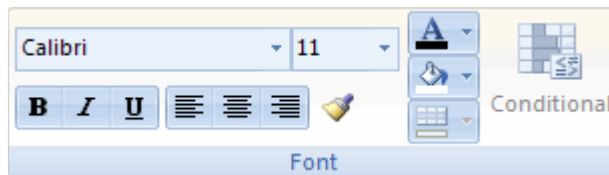


The only one of the controls that cannot be modified are the tabs of the Tab Control object (with Page8 and Page9 as the tabs). Anything inside the tabs can, however, be modified.

The Line object can have a thickness, a style, and a color, as defined in the Controls section of the ribbon:

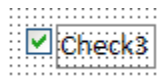



Any of the other controls that include text of some sort can be modified by using the Font section of the ribbon:



Using Control Properties

Consider the check box in the following diagram:



It consists of two different objects; the checkbox itself and a label. Each object has its own set of individual properties. To view the properties of this or any object, select the object and click the Property Sheet command in the ribbon. Properties are modifiable by using a combo box, entering a value by hand, and occasionally using the  icon to open a Wizard or external resource in order to set a property. We will use the check box itself as an example.

Format Tab

Modify how the control will appear in the form including how wide the border around the check box will be, what sort of style the check box will have, the color of the border, and how much space is around the check box.

Data Tab

A check box can have a control source (such as a Boolean or true/false) from a table, a validation rule, whether the option is enabled and/or locked, and even if you would like to have a 'triple state' check box (one that is either true, false, or null.)

Event Tab

Controls what the check box will do when it is interacted with. This includes what will happen if the mouse is moved on top, is clicked, is double-clicked, and how the check box responds when a key is pressed.

Other Tab

You can modify other properties of the check box such as its name, if it

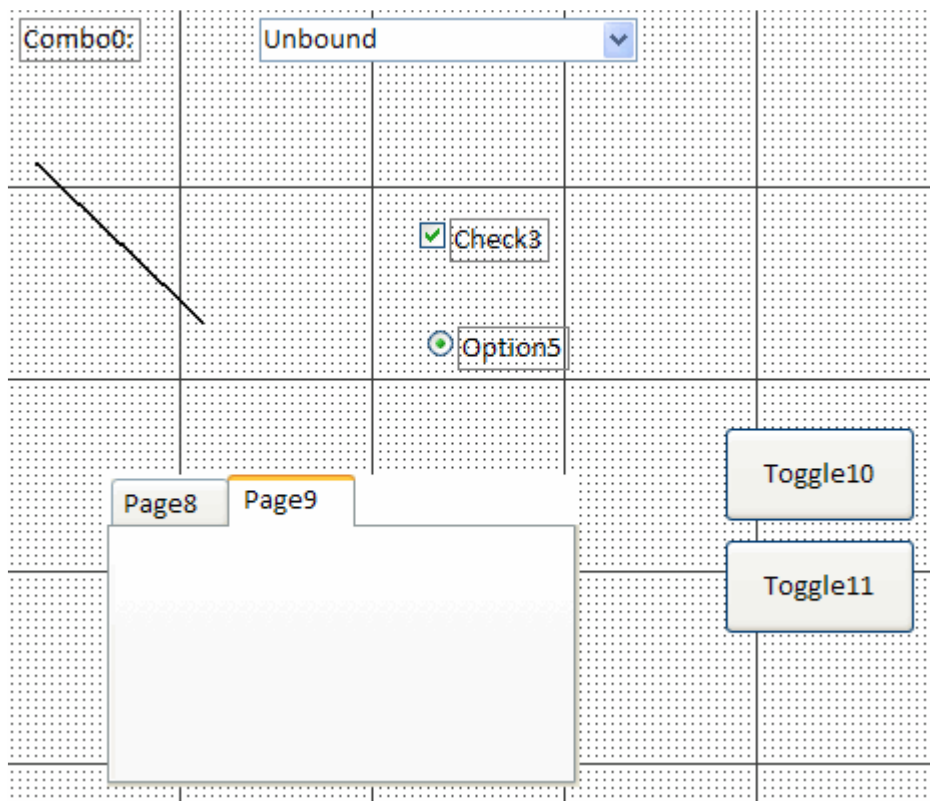
can be reached and interacted with when the Tab key is pressed, and if it will display text in the Status Bar. (The status bar is visible at the bottom of the Access window while in Form view. It tells a user what the control does or what change it has on the form/database).


All Tab

All controls combined.

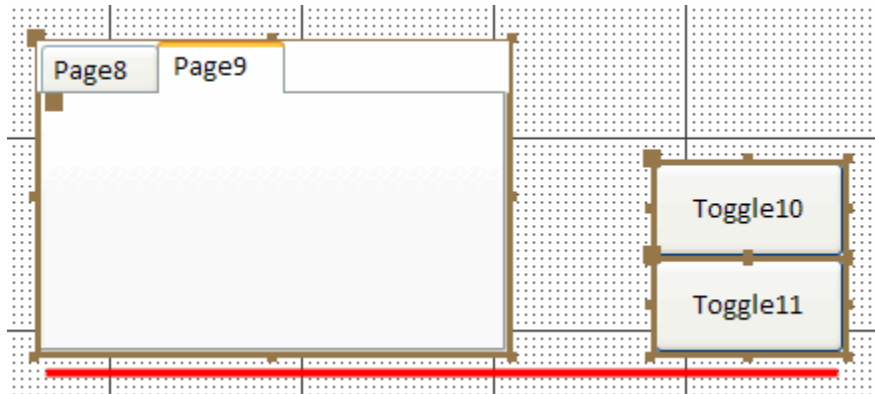
Aligning Controls

Changing the size of the design grid and using the mouse works fine for small forms. But in the case of forms with many controls, or in the interest of saving time, Access has a number of alignment commands built into the Form Tools - Arrange ribbon. Consider the following group of controls that we would like to format:

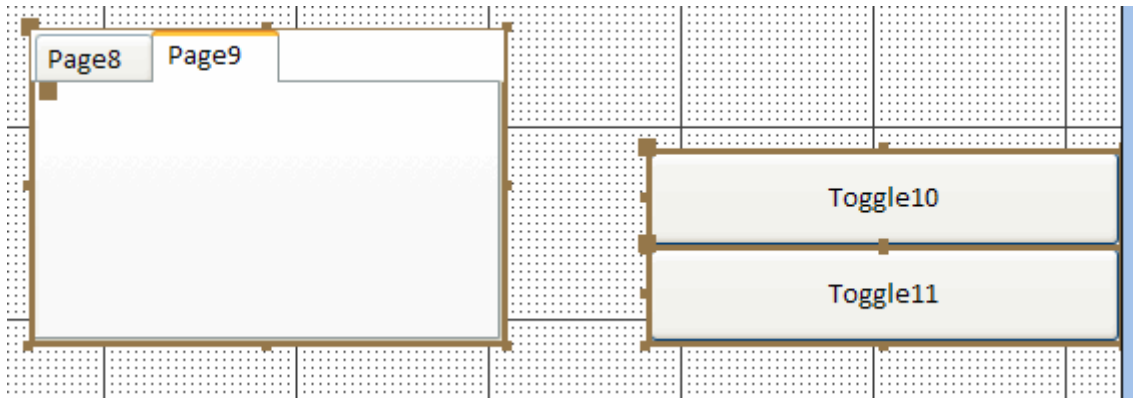


We will cover the full functionality of the Layout ribbon in the next lesson. For now, select two objects like the control group and toggle buttons. Click the Bottom command ( Bottom) in the Control Alignment section of the ribbon.

This will align all controls to the bottom of the lowest control in the form:



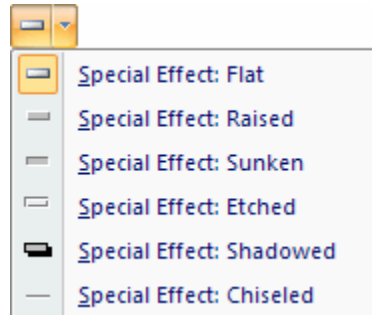
Clicking the To Widest command expands all controls to the same width as the widest one currently selected:



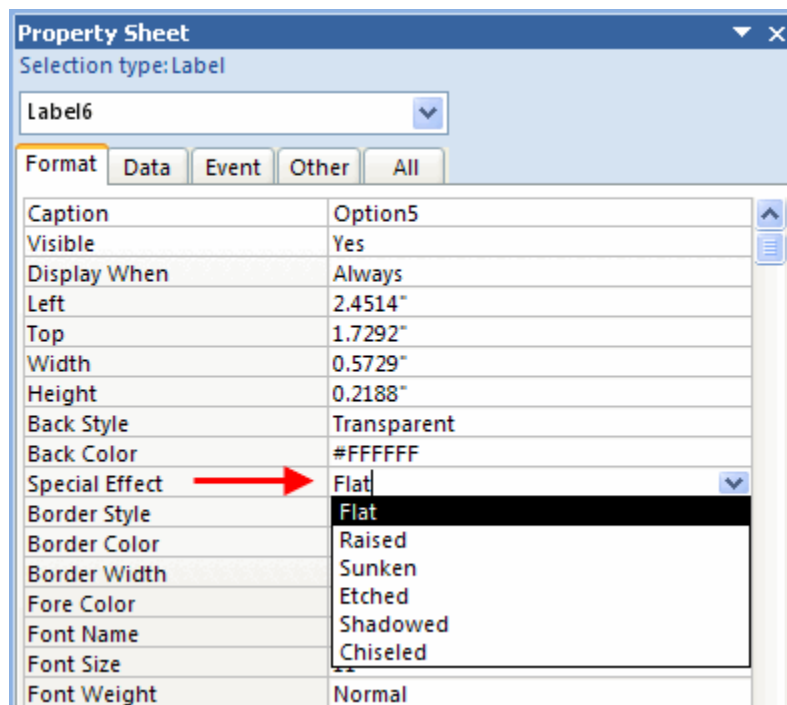
Applying Special Effects

Nearly every control in a form can have some sort of special effect applied to it to make the control look a bit more stylized. If a control can have an effect applied to it, the special effects command will become active in the Form Tools - Design ribbon.

Click the pull-down arrow beside the command to show the available effects you can choose:



The special effects can also be applied in the Property Sheet:

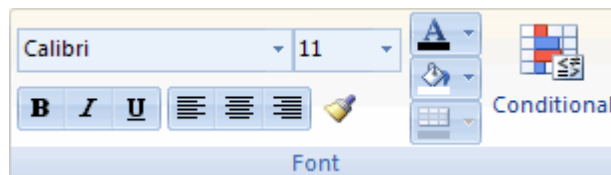


Formatting Records

In the final lesson on forms, we will cover the last of the commands and functionality available for use.

Modifying Fonts

Regardless of if you are in Layout or Design view, you always have the ability to change the font quickly and easily. Use the Font section of the Home ribbon (which is always accessible), the Form Tools - Formatting ribbon while in Layout view, and the Form Tools - Design ribbon when in Design view.



Using AutoFormat

When you first begin making forms, you will likely use the form Wizard to get you started. However, the Wizard may not provide the functionality you need. Designing forms by hand is a bit more time consuming, and sometimes making a form look a bit presentable gets pushed down the list of importance. Luckily, Access features formatting color schemes that can be applied anytime before, during, or after the creation of a form.

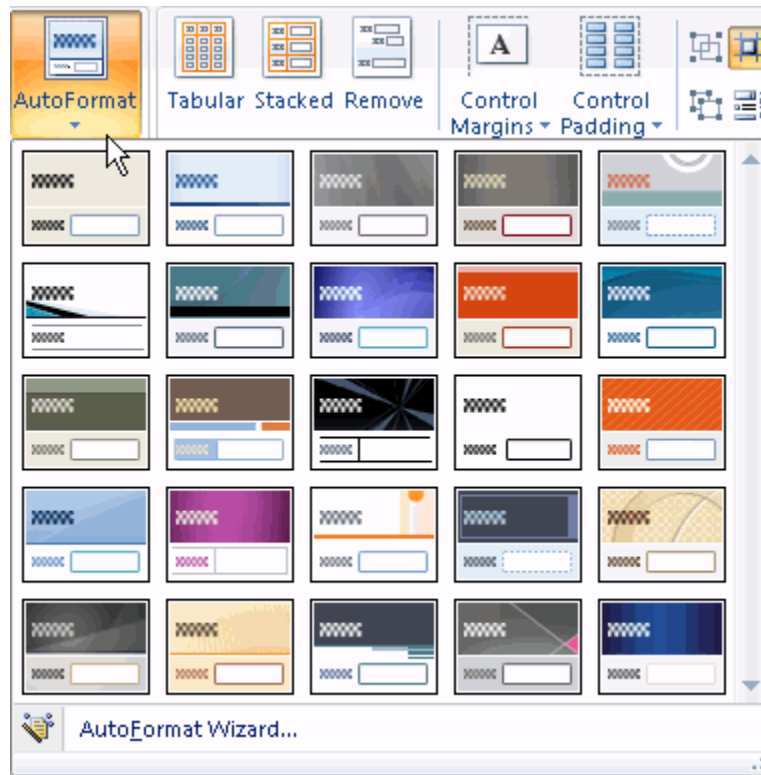
Consider the Employee Details form from the Northwind sample database:

The screenshot shows the 'Employee Details' form for 'Andrew Cencini'. The form has a blue header bar with the title 'Employee Details'. Below the header is an orange bar with the name 'Andrew Cencini'. Underneath is a grey bar with a 'Go to' dropdown, 'E-mail', 'Create Outlook Contact', and 'Save and New' links. The main area has two tabs: 'General' and 'Orders'. The 'General' tab is active, showing fields for 'First Name' (Andrew), 'Last Name' (Cencini), 'Company' (Northwind Traders), and 'Job Title' (Vice President, Sales). To the right of these fields is a placeholder for a photo and links for 'E-mail' and 'Web Page'. At the bottom are sections for 'Phone Numbers' and 'Notes'.

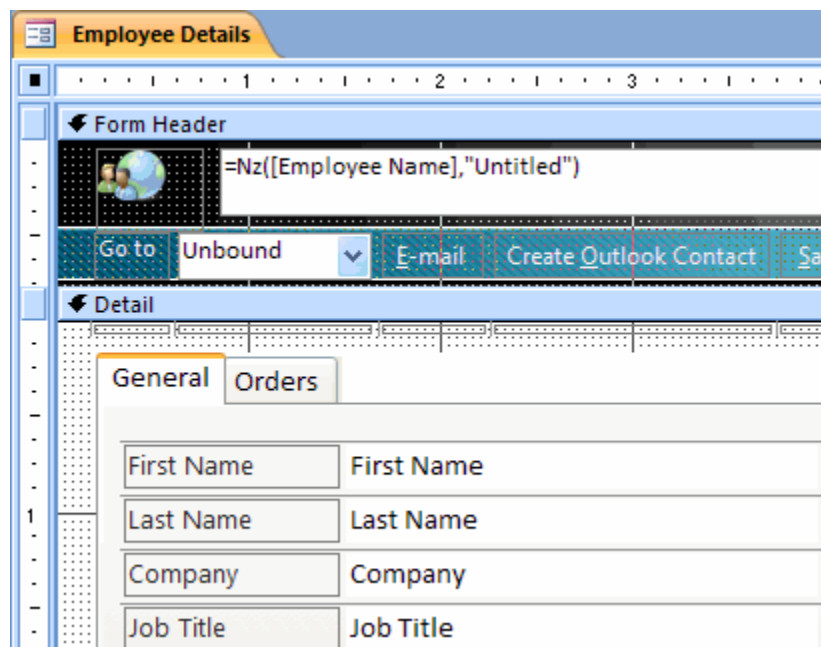
The links at the top of the page have a certain look, the labels each have their own font size and color, and the text boxes are all bright and easy to read.

However, if the form was currently unformatted, or if you didn't like the look of the form, you can use the AutoFormat command to apply a formatting change.

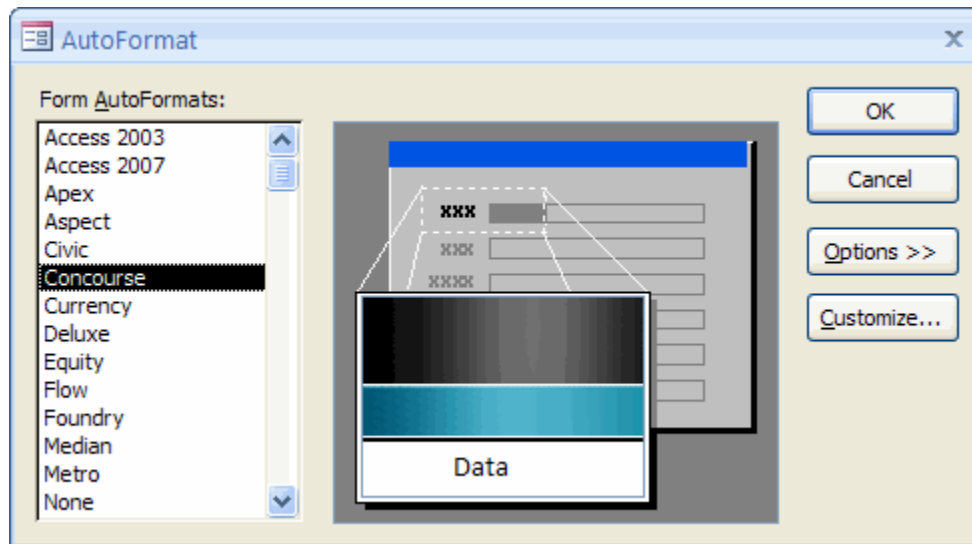
Open the form in Design view, and then click the pull-down arrow underneath the AutoFormat command in the Form Tools - Arrange ribbon:



Choose any of the 25 pre-defined formats to apply to your form:



Access also gives you the ability to customize a particular format. Click the AutoFormat Wizard button at the bottom of the AutoFormat pull-down menu to open the AutoFormat dialogue box:



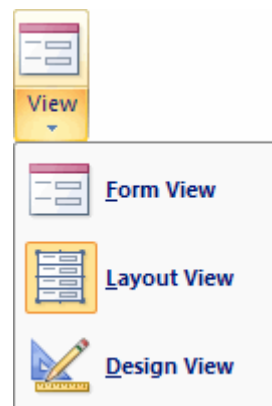
Then, click the Customize button on the right-hand side to modify the specifics of a template.

Using the Format Ribbon

The Format ribbon is visible when viewing a form in Layout view. Let's examine what each section of the ribbon is used for:

Views

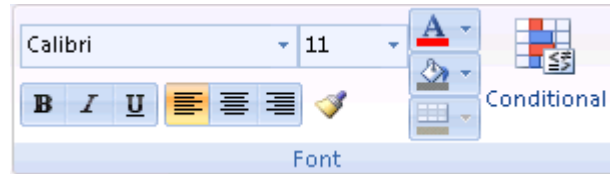
Use this pull-down command to switch between different views in the form:



Font

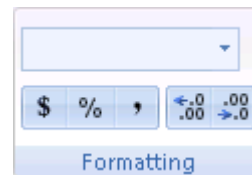
This section is used to modify the font and style of text. The Conditional command is used to apply different formatting styles

according to certain scenarios. For example, if you are calculating monetary figures, all positive values can be bold and black while all negative values can be highlighted in red.



Formatting

The formatting section is used to apply a different text style to certain numerical data. For example, clicking the \$ command will format a number to look like currency.



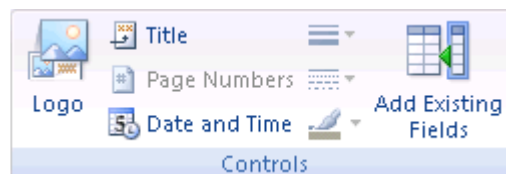
Gridlines

If you create a form based upon an existing table, all of the fields in the form are constructed as a table. Use the commands in this section to change the look of the dividing lines in the table or grid.



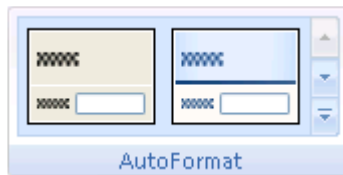
Controls

The controls section lets you add other fields to the table, add a logo, title, date and time, as well as modify the look of any lines or rectangles your form may already contain.



AutoFormat

Click the up and down arrows on the right-hand side of the section to scroll through the available formats. Click the pull-down arrow to display all available format options.

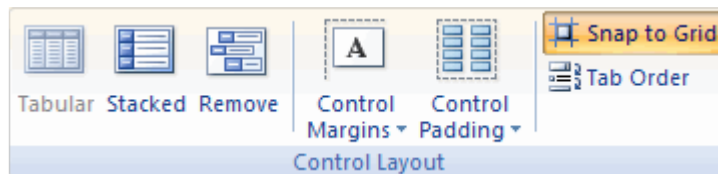


Using the Arrange Ribbon

In Layout view, the Layout ribbon contains the basic controls needed to adjust the position of the objects in the form:

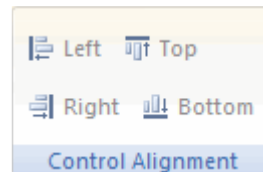
Control Layout

This section allows you to move a control or group of controls around the form, set margins of free space around controls, and set the tab order of the different controls.



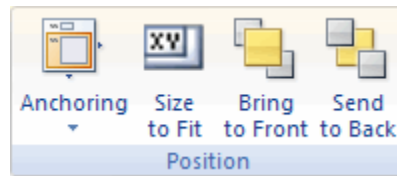
Control Alignment

This section allows you to line up two or more commands so that they are all as left as the leftmost, as right as the rightmost, or as high or low as the highest or lowest command in the selected group. These commands are very useful when building a form by hand and keeping everything neat and tidy.



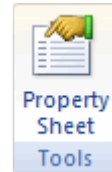
Position

These commands deal with how objects in your form relate to each other in position. The Anchoring command allows you to pin a control to the form or to another control such that if the parent control should be changed, the pinned control is formatted in the same way. Other controls involve moving controls as if they were in layers, where one control is concealed or on top of another.



Tools

This section contains the command to open the properties relating to the currently selected object.



SECTION 7: Using Advanced Report Features


As you proceed with your exploration of Access, there will likely come a time where you would like to present your data in a formal way. The query functionality provided by Access lets you extract the data you need, but is only capable of displaying data in Datasheet view. It might be functional, but not necessarily practical for your intended audience. Therefore, you can use a report to display data retrieved from a query.

Reports are also used as a formal way to display the data contained in a table.

Adding and Removing Fields

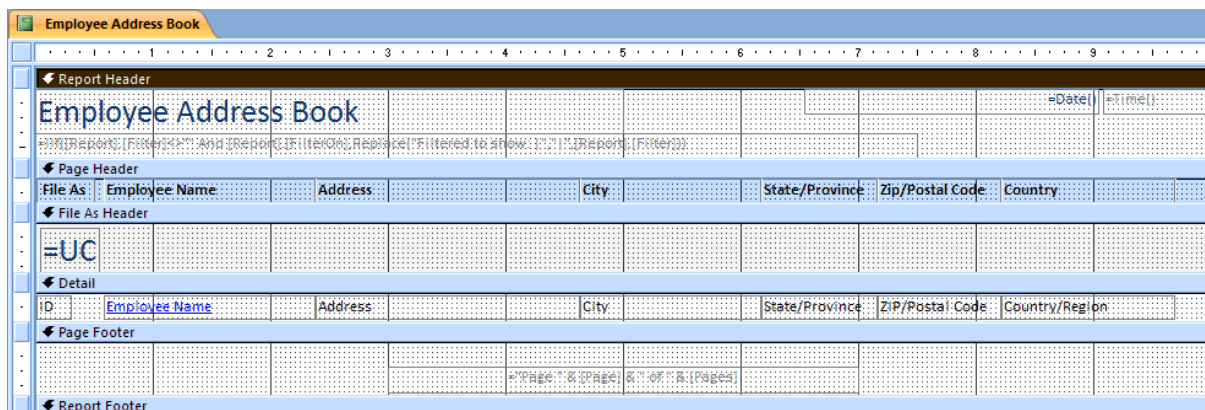
Creating reports using Access is very similar to creating forms. If you used the report Wizard, Access prompted you to select fields from different tables or queries in your database. If you first opened a table or query and clicked the Report command (in the Create ribbon), Access automatically generated a report for you containing all objects found in the parent object.

No matter which method you used to create a report, you can use Layout and Design view to modify the report. Let's take a look at the Employee Address Book report:



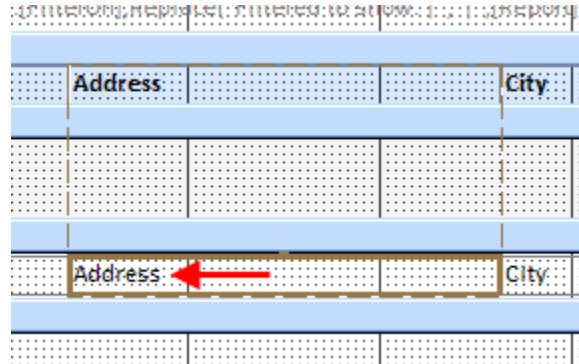
File As	Employee Name	Address	City	State/Province	Zip/Postal Code	Country
C						
	Andrew Cencini	123 Any Street	Any City	WA	99999	USA
F						
	Nancy Freehafer	123 Any Street	Any City	WA	99999	USA

Now let's look at the same report in Design view:

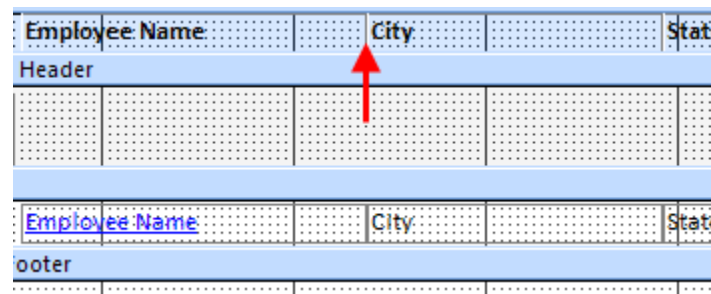


Employee Address Book						
File As	Employee Name	Address	City	State/Province	Zip/Postal Code	Country
=UC						
ID	Employee Name	Address	City	State/Province	Zip/Postal Code	Country/Region
Page 1 of 1 of 1 Pages						

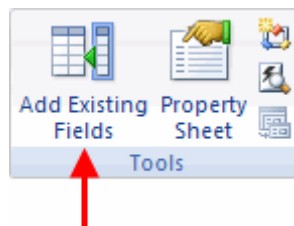
The data contained in this report is in the Detail section. It contains fields from the Employees table that are useful to the application of the report. Now imagine you want to exchange the Address field for the E-mail Address field. While in Design view, click the Address field in the Detail section:



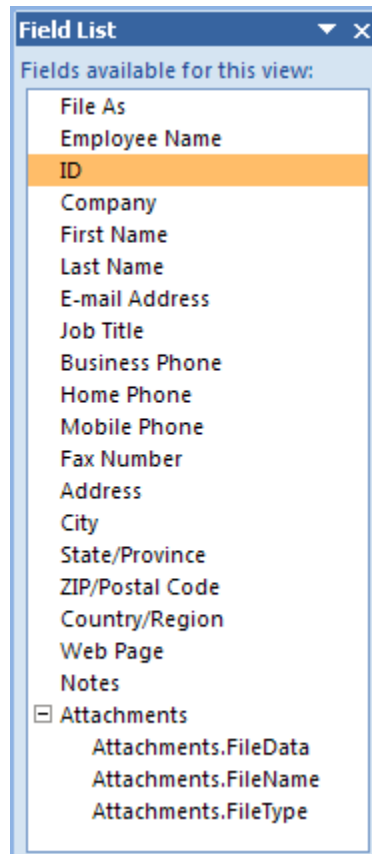
The Address field is the actual field that is selected, but notice how the Address field label is also highlighted to show the two are linked together. To remove the field, press Delete on your keyboard. The rest of the fields all shift to the left to fill in the hole left from the Address field:



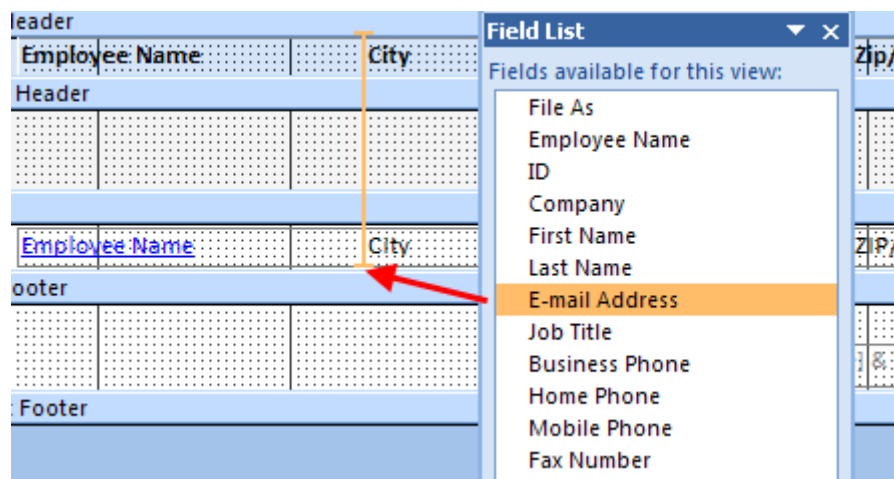
Now let's add the E-mail Address field. Click the Add Existing Fields command in the Tools section of the Report Tools - Design ribbon:



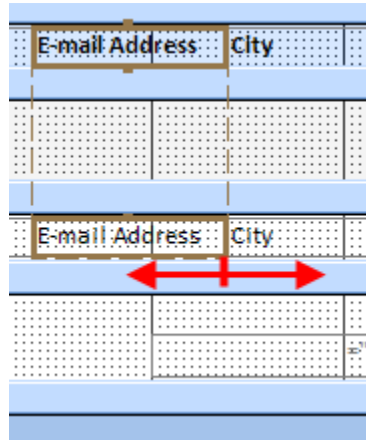
This will open the Field List pane. It contains all of the available fields from the object(s) that was used to create the report; in this case, the Employees table:



To add the E-mail Address field, simply click and drag the E-mail Address field from the Field List pane to the section of the report where you want to add the field. In this case, add the field between the Employee Name and City field. Access shows a vertical orange line in between the fields to indicate that if you release the mouse button, this is where the field will be placed:

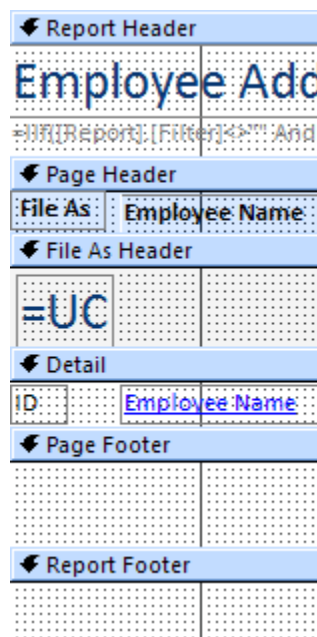


Once the field has been placed, you can drag the size of the field larger or smaller to accommodate the data contained inside. Place your mouse on the brown border of the E-mail Address field and drag to the left or right:



Using Report Sections

A report has three standard sections: Page Header, Detail, and Page Footer. Reports, like forms, can also have Report Headers and Report Footers. Let's examine the Employees Address Book report from the previous section of this lesson. This report, when viewed in Design view, contains all of these sections, as well as an additional section which we will explore later in this lesson:

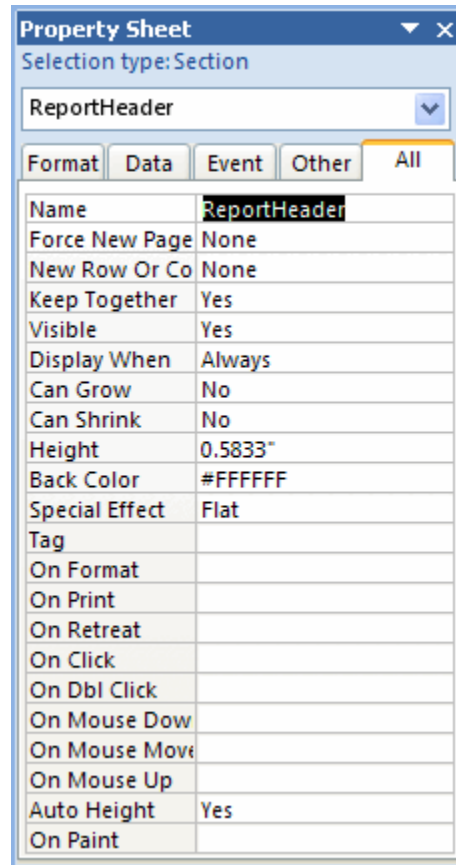


Report Header	Objects in this section will be visible at the very beginning of a report. You can use this like a title page.
Page Header	Objects that will appear at the top of every page, and under the Report Footer of the first page. In this example, the field names constitutes the Page Header
Detail	Objects that appear in the body of the report. This is usually where the bulk of the information from your table/report will be visible.
Page Footer	Objects that will appear at the bottom of every page. In the above example, the page numbers appear at the bottom.
Report Footer	Objects that appear at the very bottom of the report. You may wish to put copyright notification or a special thanks page at the end of your report by using the Report Footer section.

You might have noticed another section in the above example, the File As Header. This is not a standard header, but rather a customized level of grouping. In this example, this report is used to group all employees by the first letter of their last name. We will explore categorization and grouping later in this lesson.

Changing Section Properties

As you have likely realized by now, just about everything in Access can be modified in some way. Report sections are no exception. Click any section title (the blue bar spanning the report) to select it and then click the Property Sheet command:

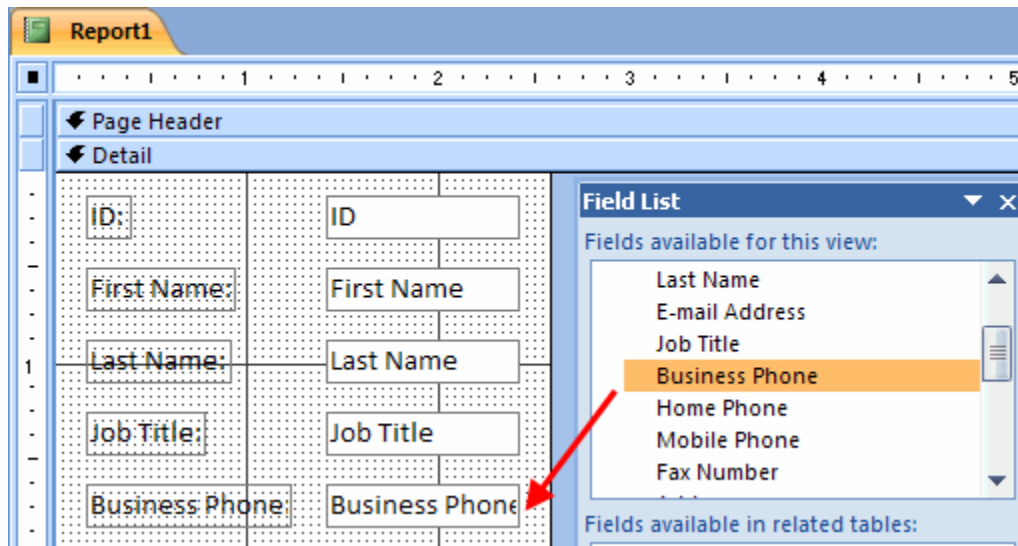


By nature, reports are primarily used to display data only. Therefore, there aren't as many properties to modify compared to other objects in Access. The properties of a report section are enough to modify the look and feel or allow the section to shrink or grow to accommodate its contents.

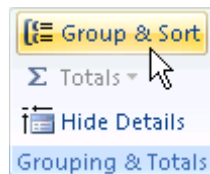
Grouping and Sorting in a Report

The Employees Address Book report contained an extra header that grouped all employees together in alphabetical order. The alphabetical listing also made a different header. We will now explore how to group certain records contained in a report together and explore how to make a customized report header later in this manual.

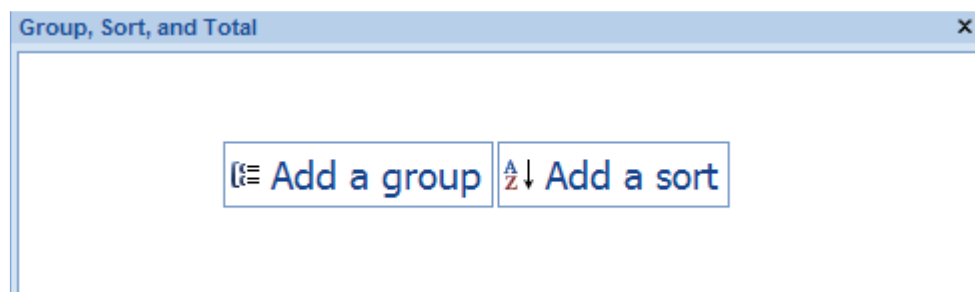
Consider the following simple report:



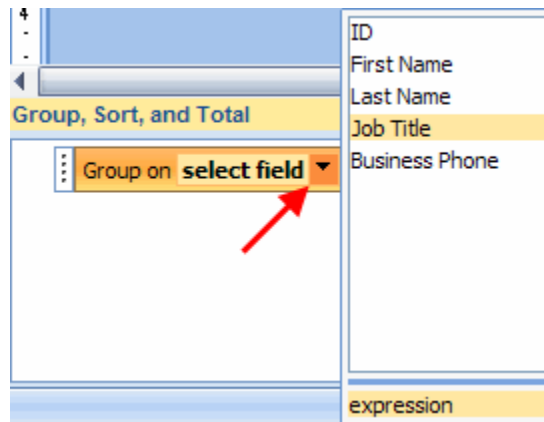
This report contains a listing of all customers in the Northwind sample database. Let's categorize the people in this report based on their job title. First, click the Group and Sort in the Grouping and Totals section of the Report Tools - Design ribbon:



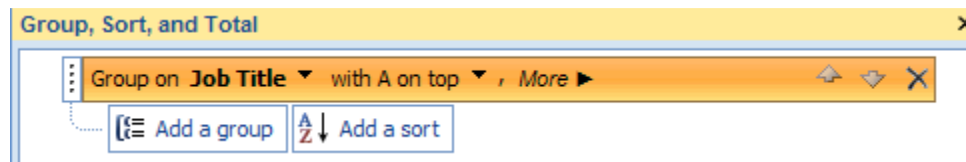
At the bottom of Design view, you will see the following Group, Sort, and Total section:



Click the Add a group button. Click the pull-down arrow beside Group on: and select the field you wish to use as the grouping control; Job Title in our example:

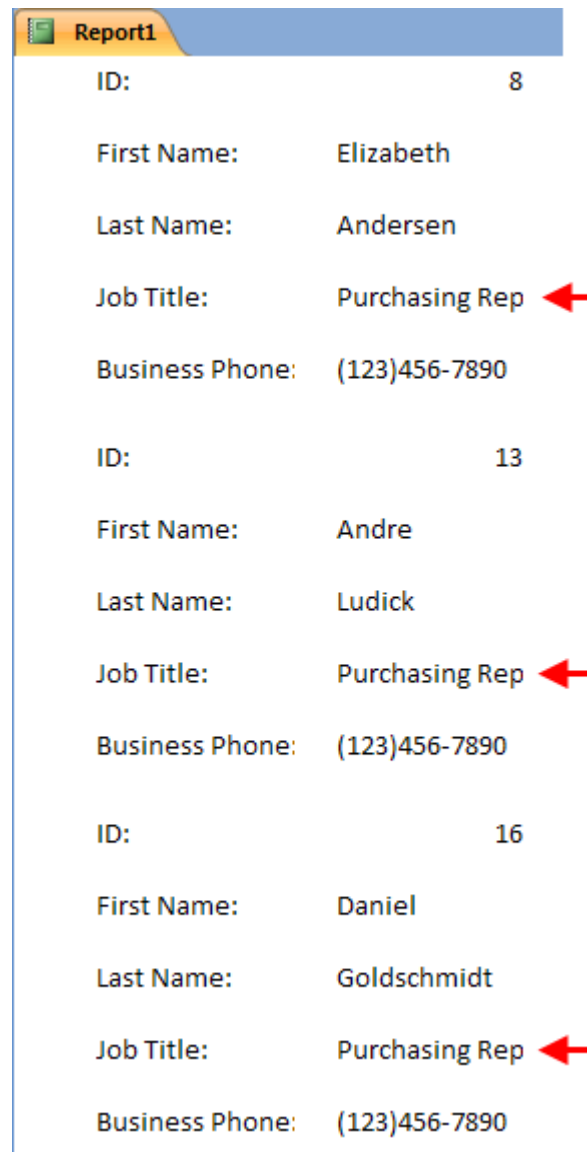


Once you have selected the field you want to use to group with, more options will appear to modify, including if you wish to sort alphabetically:



Now that the grouping is applied, switch back to Report view.

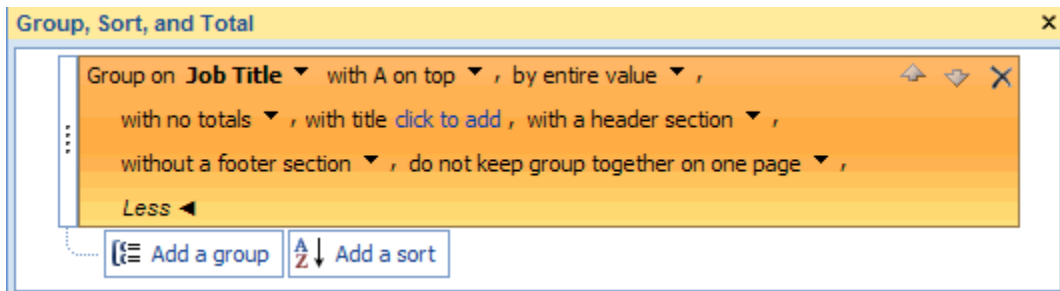
You will notice the records in the report have grouped themselves according to the Job Title of each customer:



ID	First Name	Last Name	Job Title	Business Phone
8	Elizabeth	Andersen	Purchasing Rep	(123)456-7890
13	Andre	Ludick	Purchasing Rep	(123)456-7890
16	Daniel	Goldschmidt	Purchasing Rep	(123)456-7890

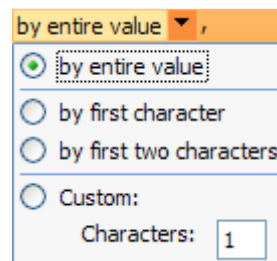
Changing Group Properties

Click the More command on a group or sort in the Group, Sort, and Total section to see extra commands pertaining to the operation:

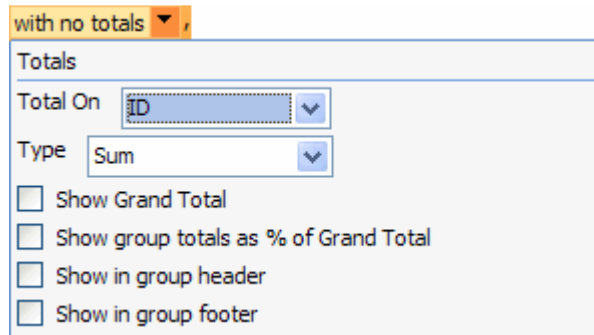


From left to right, the default options (and how they can be changed) are:

- Group On** The particular field that is being grouped.
- With A on Top** Choose either ascending or descending order.
- By Entire Value** You can choose to group or sort according to a certain number of characters. Use this to apply a custom search level.



- With No Totals** If your table contains numeric data, you can apply totals. Choose the field contained in your report from the Total On combo box and the type of total (sum, count, min, max, avg). Results can be displayed as a fraction of a grand total and shown in the group header and/or footer.

**Report Footer**

Objects that appear at the very bottom of the report. You may wish to put copyright notification or a special thanks page at the end of your report by using the Report Footer section.

With Title

Give the group or sort a name.

With a Header Section

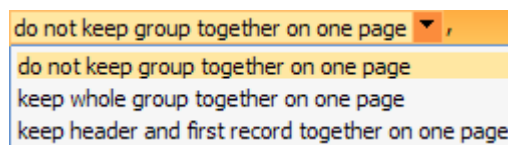
Add or remove a Header section to your report.

Without a Footer Section

Add or remove a Footer section to your report.

Do not Keep Group Together on One Page

This command forces Access to display grouped data together as one piece. For example, in some situations it may be very inconvenient to have to flip back and forth between two pages to see the entire group. These commands help prevent that from happening.

**Less**

Collapses the commands down to a smaller group to save space.

If your situation requires it, you can apply more than one grouping or sort order to your report. Simply click the “Add a group” or “Add a sort” buttons at the bottom of the Group, Sort, and Total section.

As you add more grouping and sort orders, you can adjust the order of each command applied to your report. Select a command, then click the up and down arrows on the right-hand side of the Group, Sort, and Total section. Or, click the X button to remove a selected group or sort command.




Using Calculated Controls in a Report

Reports, like forms, can contain calculated controls. You will primarily use calculated controls to find subtotals and totals, though they can contain logical operations as well. Consider the following report about the products carried by Northwind Traders:

The screenshot shows a report titled 'Report1' with a 'Page Header' and a 'Detail' section. The 'Detail' section contains a table with three columns: 'ID', 'Product Name', and 'Standard Cost'. The 'ID' column has a label 'ID:' and a text box 'ID'. The 'Product Name' column has a label 'Product Name:' and a text box 'Product Name'. The 'Standard Cost' column has a label 'Standard Cost:' and a text box 'Standard Cost'.

The Standard Cost is the cost paid by a retail customer. If you would like to see what the price would be with a 7% sales tax, you can use a calculated control to find the result. Create a new text box using the Report Tools - Design ribbon. Use the Property Sheet to modify the Control Source of the control:

The screenshot shows the 'Property Sheet' for a text box control. The 'Control Source' is set to the calculated expression `= [Standard Cost] * 1.07`. The 'Format' is set to 'Currency'. The 'Name' is 'Text4'. The 'Selection type' is 'Text Box'. The 'Property Sheet' has tabs for 'Format', 'Data', 'Event', 'Other', and 'All'. The 'Control Source' field is highlighted with a red arrow, and the 'Format' field is also highlighted with a red arrow.

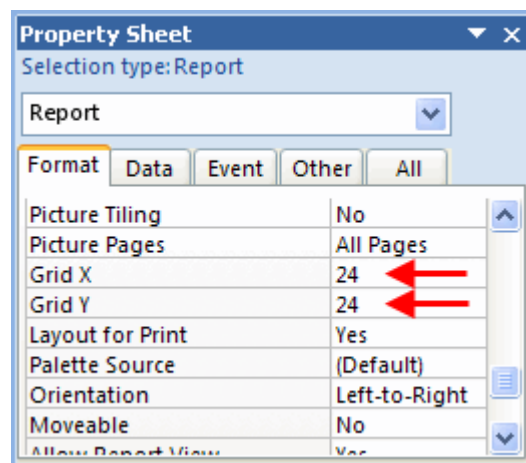
Most of the calculated controls you will create in a report will be fairly simply arithmetic expressions. Should you need to create more complex expressions, use the Expression Builder by clicking  in the Control Source field. The one thing to remember when creating calculated controls is to make sure each control is given a meaningful name. You can modify the name of the control in the Other tab of the object properties.

Formatting Reports

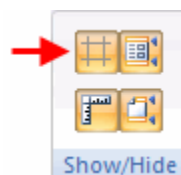
We have seen that building reports and forms is a pretty easy job with a little planning and care. Once you have decided what information you would like in the report and have added the elements, you can begin the task of making your report look nice.

Formatting Gridlines

Gridlines are adjustable in reports by the same means as in forms. Double-click the report selector button in the upper-left hand of the report to open the Report Properties. The Format tab contains the Grid X and Grid Y properties:

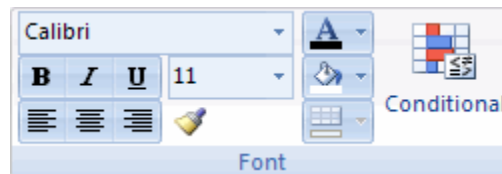


Enter a number from 1 to 64 to divide each square inch of the report into that many increments. If you would rather work without the gridlines, click the Gridlines command in the Show/Hide section of the Report Tools - Arrange ribbon:



Modifying the Font

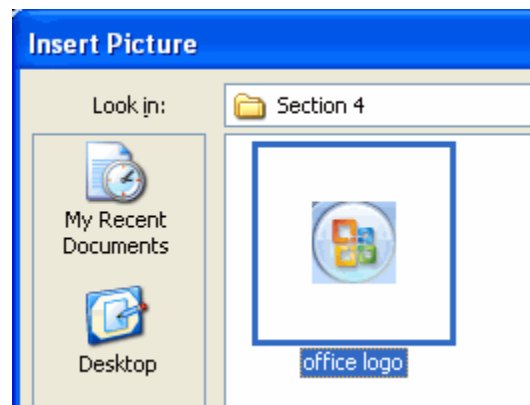
Modification of a font in a report is as simple as highlighting the control or object you want to format and then using the Font section of the Report Tools - Design or Home ribbon:



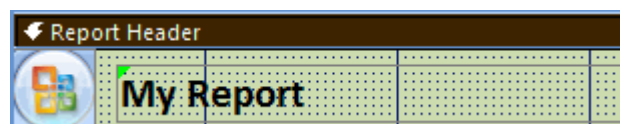
If you don't like the style of a control, simply change the control back to what it was or use the Undo Command (Ctrl + Z on your keyboard). Remember that you can use the Format Painter to change the look of many objects with a single click.

Adding Logos

While in Design or Layout view, use the Logo command in the Controls section to apply a logo to the top of your form. Access will prompt you to locate the image you want to use as a logo:



Any logo you apply will be placed in the Report Header by default. You can use the Label command to make a title to go alongside the logo if you wish:



Changing the Layout

Now that you have all elements you want in your report and looking the way you want, you can fine-tune the layout to meet your requirements. By using the gridlines and a good resolution, you can adjust the layout of components down to the nearest 64th of an inch. Once you have everything looking the way you like, you can adjust many background attributes of a report using the Property Sheet function.

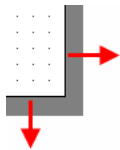
However you decide to style your report is up to you; after all, it is your report! But consider the following tips as you build your report:

Adjust the Grid Size

This is more of a matter of preference, yet it is good to have even horizontal and vertical grid resolution. 8x8 is a good size to use because the rulers along the top and left side of the Design view window are divided in 1/8" portions. However, if you have an application requiring a grid 7x33, Access lets you pick whatever resolution works for you. You can also change the resolution at any time without moving the controls already in place.

Adjust the Canvas Size

Maximizing the report Design view window will give you the best working experience when layout is concerned.



You can make any report section, such as a header or footer, as big as you like. Simply move your mouse to the section header, then click and drag up or down to increase or decrease the size. Move your mouse to the edge of the canvas to drag left or right, using the horizontal ruler as a guide.

Snap to Grid

Snap to Grid is a feature already built into Access' Design view. It automatically aligns the upper-left corner of any control to the closest point on the grid.

Once a control is in place, click the large brown box in the upper left-hand corner of the control to move the control itself, or any of the smaller boxes on the other sides and corners to adjust the height and/or width of a control.

Lastly, Snap to Grid makes it very easy to align controls using the arrow keys on your keyboard. Each keystroke in any direction moves the control one unit of measurement defined by your grid size.

Group Selection and Moving

At any point, you can select a number of controls and move them as a whole unit. Click in an empty space of the canvas to deselect any objects that might be selected. Click and drag a box around the objects, and then

click and drag the objects as a group. This technique is useful if you have already constructed some controls based on one grid resolution and then change to another grid resolution. Instead of moving each control again, select all of them at once and move them together.

Try, Try Again!

If you make a formatting error that causes a large disruption in the layout of your controls, don't panic; you can undo the action and restore the controls to their previous state.

Press Ctrl + Z to undo a command. Access saves the last 20 commands, so if you made a mistake several clicks ago, you will likely be able to back out of your problem and try again.

Save Frequently

Often when designing things, we get a bit too wrapped up in what we were doing and forget to save our changes. If the power should go out or if your computer becomes unresponsive, you will lose any changes since the last save or AutoSave.

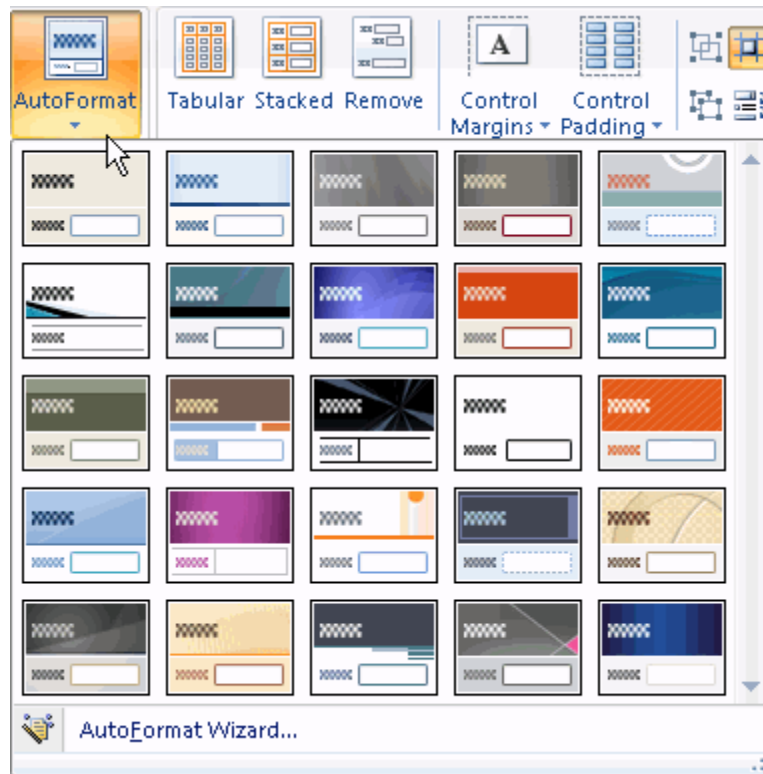
Remember that you can either backup the database before you perform a lot of operations or save a copy of a particular database object before you start working. Should you get in over your head, you can always pull out the backup and try again.

Using AutoFormat

Some people have a real knack for style and design, but often the look of a report becomes a low priority next to getting the actual report constructed. Fortunately, Access features an AutoFormat command that will format your report in one of two ways

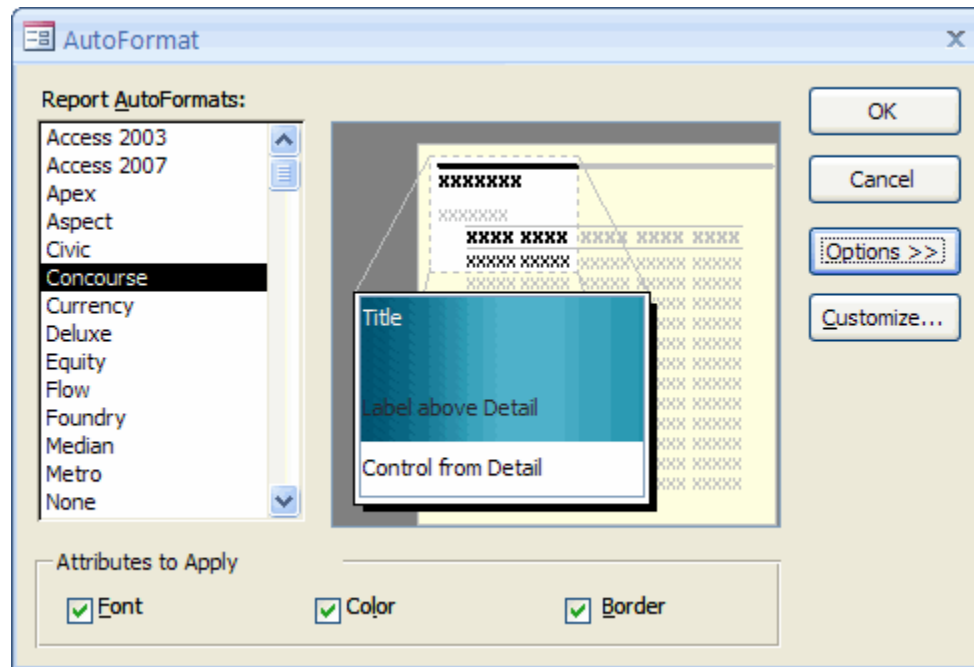
If you have chosen to build your report using the Wizard, you will be prompted to pick a style from one of the pre-formatted styles built into Access. Each level of header and footer as well as the style of each control stays consistent throughout.

If you have built your report manually, you can apply any of the pre-made formatting styles by clicking the AutoFormat command in the Report Tools - Arrange ribbon.

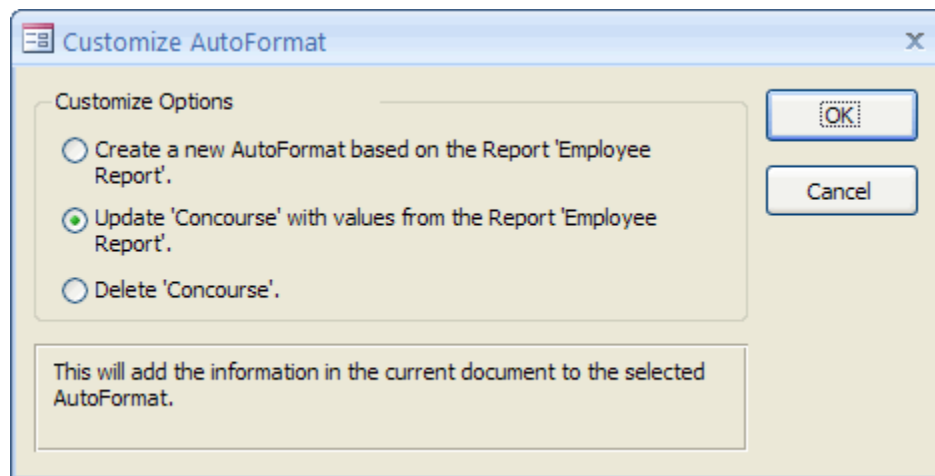


Select a theme from the pull-down menu. In addition to selecting a format, you can modify certain elements of an existing theme. From the AutoFormat pull-down menu, click AutoFormat Wizard.

Then, click the Options button to decide which elements to modify:



Then, click the Customize button to modify elements of the theme:



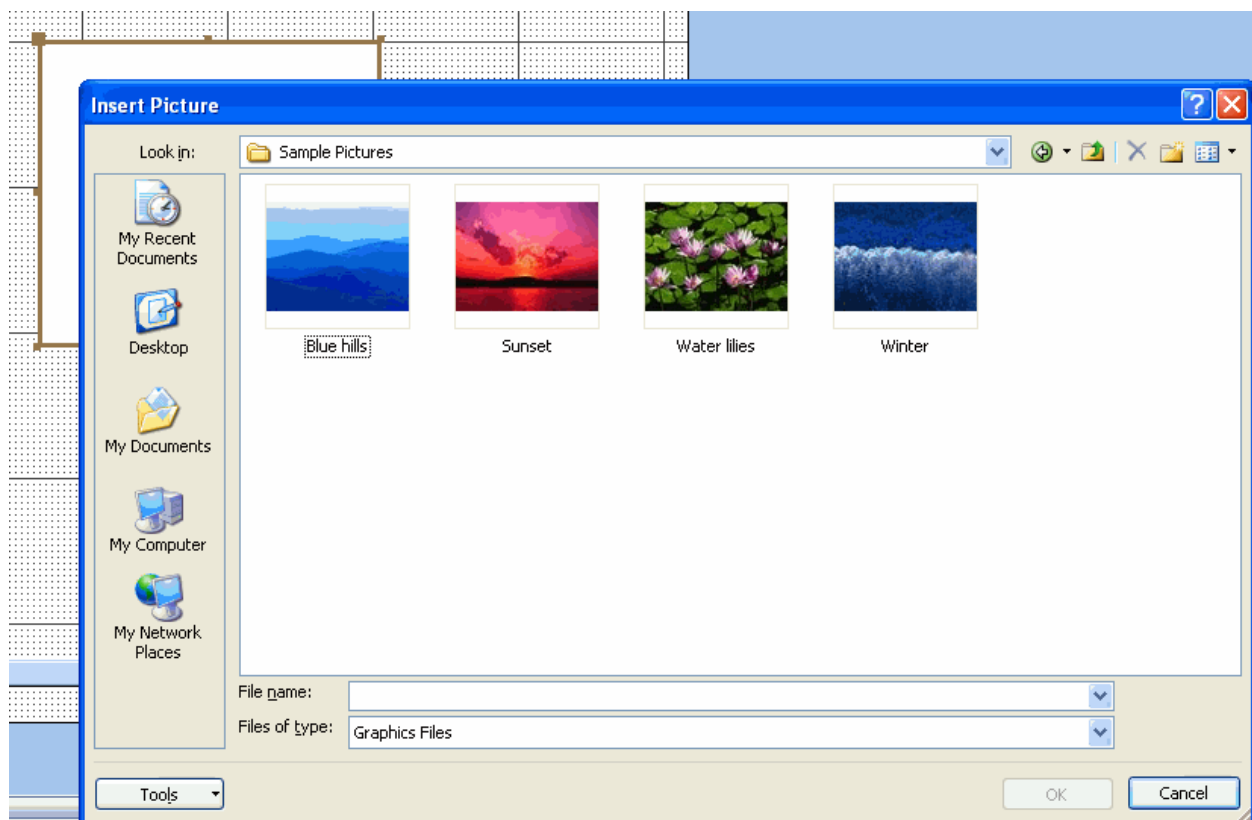
Choose an option and click OK, then adjust the elements as you see fit.

Common Report Tasks

As all the pieces of your report begin to come together, you can apply the formatting and ensure that the report gives you the information you need to know. Then your report will be ready to publish and print as handouts or catalogues. In the final lesson of this section, we will discuss how to give a report some extra flair to effectively present your product or data.

Adding a Photo

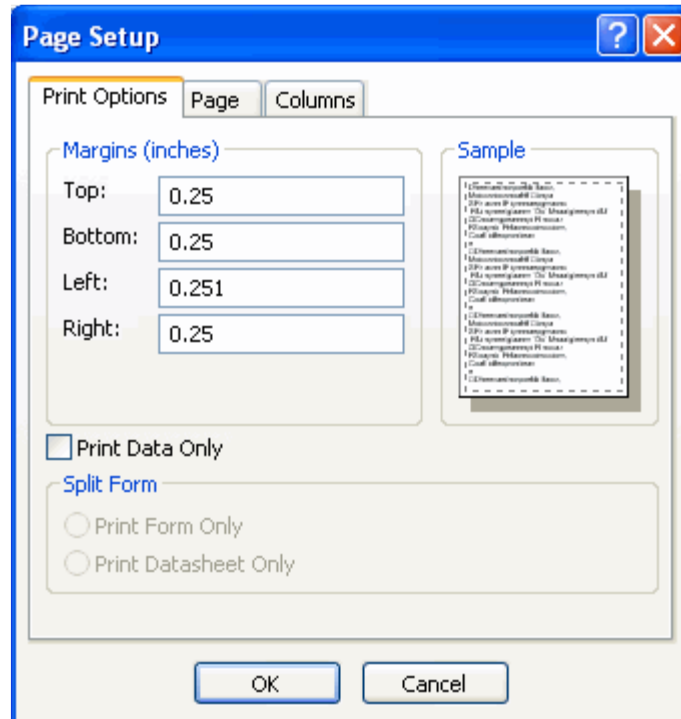
Adding a photo to a report is just like adding any other control to a report. To add a photo, click the Image command in the Report Tools - Design ribbon and then click and drag somewhere in the appropriate section you want the photo to appear:



Navigate your computer to find the picture file you want to insert into the report, and then click OK. The image will be inserted as a best fit into the area you specified.

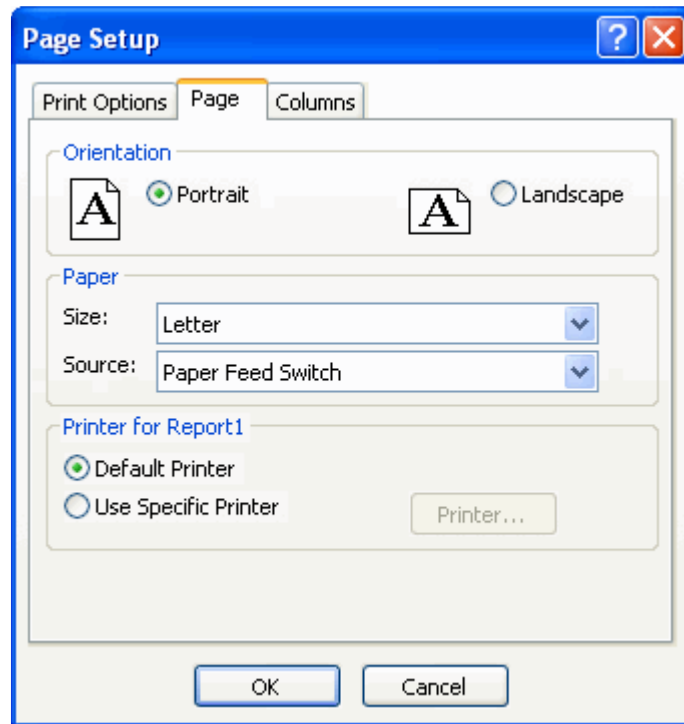
Adjusting Page Properties

Access 2007 features a number of page formatting options. Click the Report Tools - Page Setup tab to see the most common commands available for use. You can also click the Page Setup button to see extra commands:



Print Options Tab Adjust the size of the margins for your page. If you would prefer to print only the data and not any logos or pictures, click the Print Data Only check box.

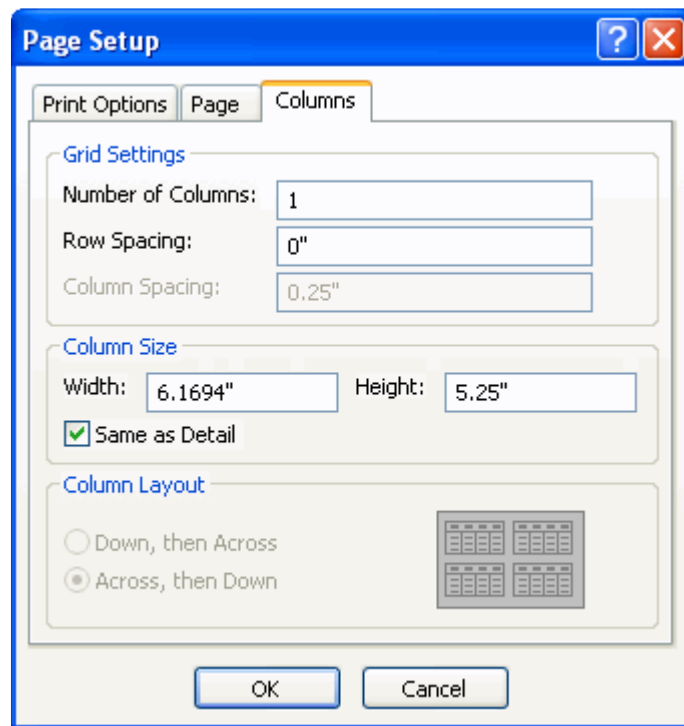
Page Tab The Page Tab allows you to adjust the page orientation (portrait or landscape) as well as the size of paper you can print with using your current printer.



Columns Tab The Columns tab is used if you want to print two or more pages of a report on one piece of paper. The number of columns, row spacing, and column spacing fields allow you to specify the dimensions between the multiple pages on your report.

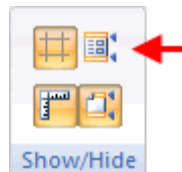
The column size fields specify how large you would like each page of the report to be on the printed page. You can also check the Same as Detail checkbox to make the printed size the same as the current dimensions of the Detail section.

Lastly, you can choose how the layout of the report pages will be ordered by choosing one of the radio buttons. (The Column Layout control group is only active when you have two or more columns.)



Adding Headers and Footers

If you build a report from scratch in Access, you won't see the Report Header or Footer right away. Click the Report Header/Footer command in the Show/Hide section of the Report Tools - Arrange ribbon:



Report Headers and Footers appear at the very beginning and end of the report, respectively. Report Headers can be used as title pages and footers can be used as acknowledgements or contact information that will be shown at the very end of the report.

If you don't need a certain report section, click and drag the bottom of the canvas or the top of another section up to the top of the above section. For example, if you want a report footer but no header, click and drag the Page Header up to meet the bottom of the Report Header. You

will still see the blue bar that spans the width of the report, but that section of the report will be empty.

Adding Page Numbers

If you have experimented with the Northwind sample database, you have likely noticed that some reports have page numbers at the bottom in the Page Footer. The page numbers are a type of calculated control; they are a text box with a formula in the Control Source property:

= "Page " & [Page] & " of " & [Pages]

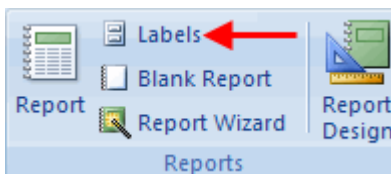
The text in between the quotations is shown on the page, and the combination of ampersands and [Page] references are values used by Access to denote the page numbers of the report.

You can add page numbers in any section of the report you like. You can also apply font style and color changes as you would to any other control.

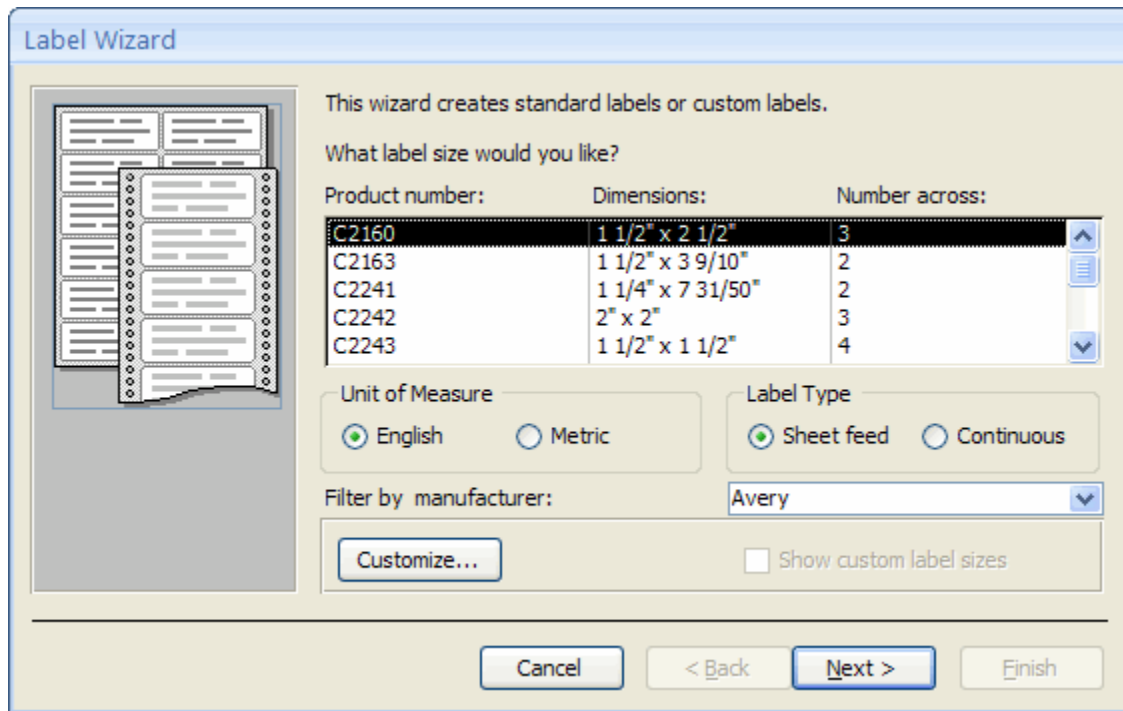
Using the Label Wizard

One of the nice things about databases on computer is that they allow you quick access to a lot of data in a hurry. If you were the marketing manager of Northwind and wanted to send a catalogue out to all of your customers, it would take you hours to type or copy and paste the addresses into a word processing document for printing onto labels or envelopes.

Fortunately, you don't have to do any of that should you need to create a mailing list. Access has a handy Label Wizard built right in! Select a query or table in the Navigation Pane you want to use as the source data for your labels. Click the Labels command in the Reports section of the Create ribbon:



The first step of the Label Wizard asks you what sort of labels you want to use:



This wizard creates standard labels or custom labels.

What label size would you like?

Product number:	Dimensions:	Number across:
C2160	1 1/2" x 2 1/2"	3
C2163	1 1/2" x 3 9/10"	2
C2241	1 1/4" x 7 31/50"	2
C2242	2" x 2"	3
C2243	1 1/2" x 1 1/2"	4

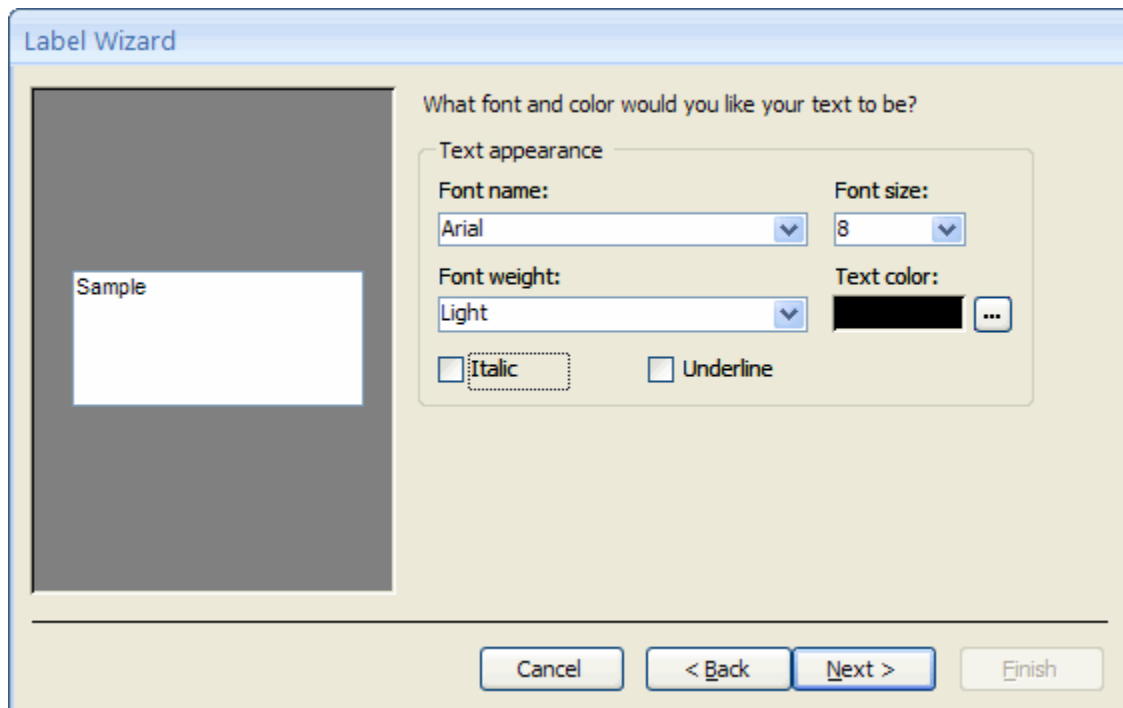
Unit of Measure: ☒ English ☐ Metric

Label Type: ☒ Sheet feed ☐ Continuous

Filter by manufacturer: Avery

☐ Show custom label sizes

There are a wide number of manufacturers, shapes, and sizes to suit your needs. You can also enter custom dimensions by clicking the Customize button. The next step of the Wizard asks you to design the text that the Wizard will use to create the labels:



What font and color would you like your text to be?

Text appearance

Font name: Arial

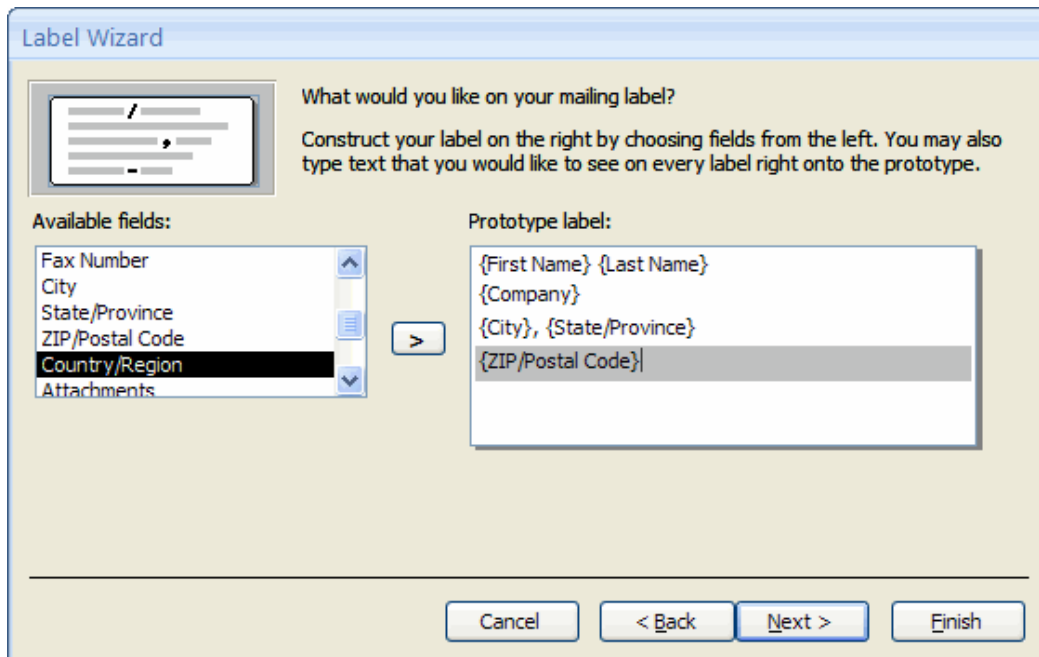
Font size: 8

Font weight: Light

Text color: [Black] ...

☐ Italic ☐ Underline

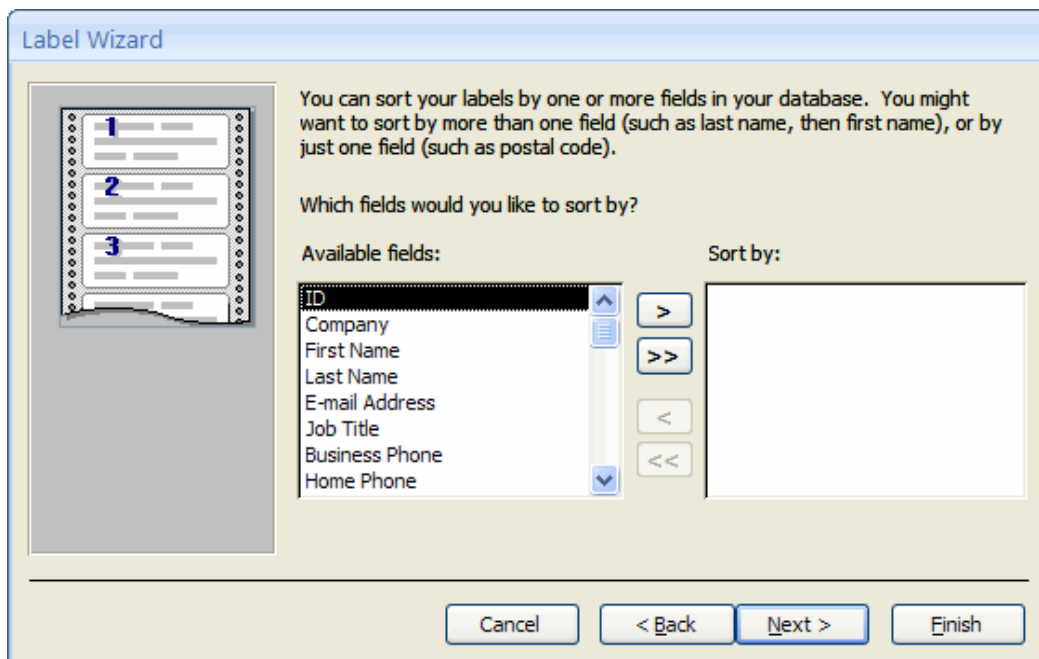
The next stage of the Wizard has you construct the label on the screen:



The 'Label Wizard' dialog box is shown. It has a title bar 'Label Wizard'. Inside, there's a small preview of a label on the left. To the right, the text says: 'What would you like on your mailing label? Construct your label on the right by choosing fields from the left. You may also type text that you would like to see on every label right onto the prototype.' Below this, there are two main sections. On the left, 'Available fields:' contains a list box with 'Fax Number', 'City', 'State/Province', 'ZIP/Postal Code', 'Country/Region' (highlighted), and 'Attachments'. To the right of this list is a right-pointing arrow button '>'. On the right, 'Prototype label:' contains a text box with the following placeholder text: '{First Name} {Last Name}', '{Company}', '{City}, {State/Province}', and '{ZIP/Postal Code}' (highlighted). At the bottom, there are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish'.

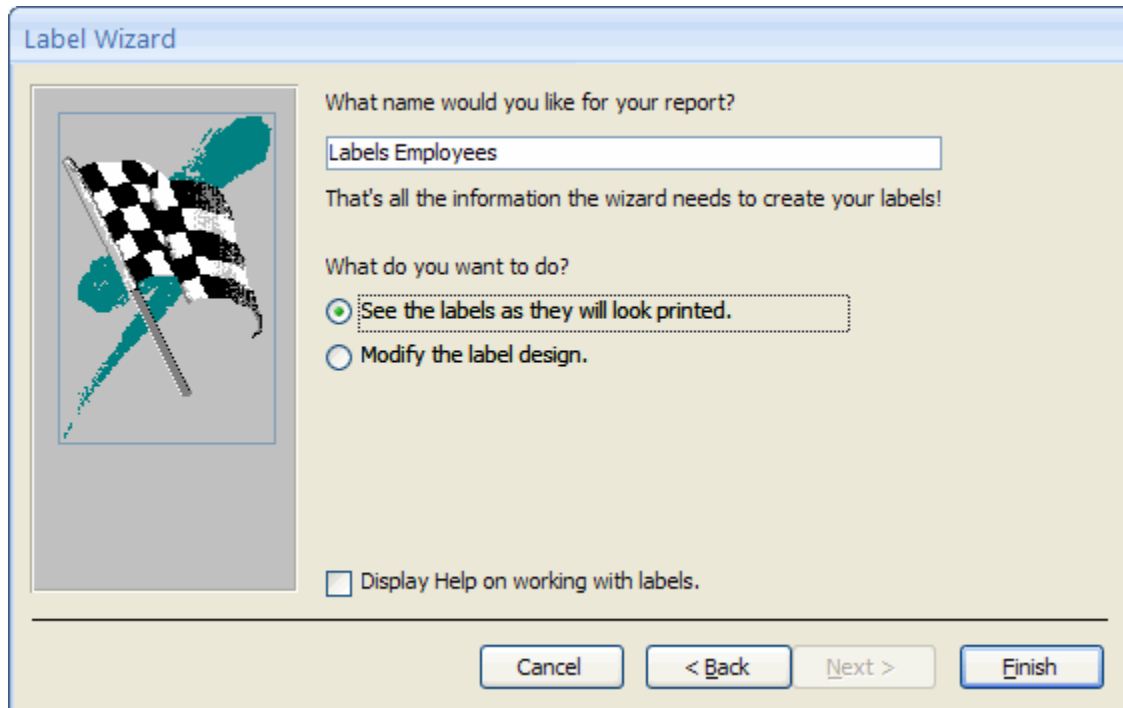
To build the label, click the one of the available fields and click the (>) button to transfer the field to the label. The currently active row is highlighted in grey. Click anywhere inside the prototype label diagram to make that row of text become active. At any point, you can also type any special characters you like, such as spaces, colons, or commas.

The next step of the Wizard allows you to sort the label order based on a sorting filter.

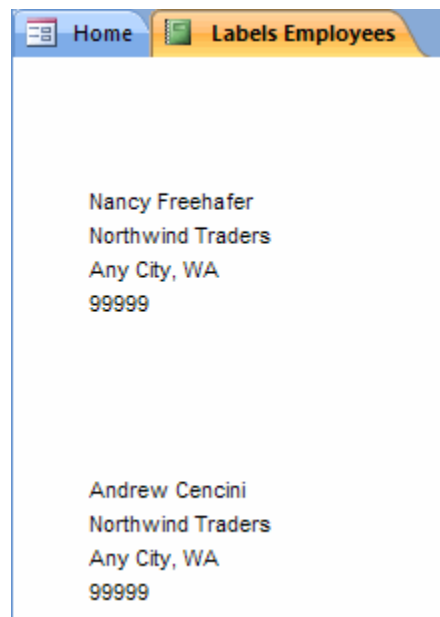


The 'Label Wizard' dialog box is shown in its second step. The title bar is 'Label Wizard'. On the left, there's a preview of a label with three rows numbered 1, 2, and 3. To the right, the text says: 'You can sort your labels by one or more fields in your database. You might want to sort by more than one field (such as last name, then first name), or by just one field (such as postal code).' Below this, the question 'Which fields would you like to sort by?' is followed by two sections. 'Available fields:' contains a list box with 'ID' (highlighted), 'Company', 'First Name', 'Last Name', 'E-mail Address', 'Job Title', 'Business Phone', and 'Home Phone'. To the right of this list are four buttons: '>', '>>', '<', and '<<'. To the right of these buttons is a 'Sort by:' text box. At the bottom, there are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish'.

The final stage of the Wizard lets you name the labels as a group. By default, Access will name them Labels <Tablename>:



If you click Finish, the labels will open in Report view and are ready to be printed:



The Label Wizard is fairly thorough so you will rarely modify labels. However, using the label Design view lets you add other graphical elements to labels such as logos or dividing lines.

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