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Access

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CONTENTS

Unit 1: Advanced File Tasks	1
1.1: Database Management	1
Compact and Repair a Database	1
Backing up Your Database	2
Editing Database Properties	4
1.2: Saving Your Files	5
Using the Save As Dialogue	5
Using the Save As Menu	7
Using AutoRecover	10
Unit 1.3: Exporting Files	11
Exporting to PDF or XPS	11
Exporting to Word or Excel	12
Exporting to Other Destinations	17
Using Saved Exports	18
Exporting to a CAB File	20
Exporting to Older Versions of Access	23
Unit 1.4: Linking Files	27
Linking to an Excel Spreadsheet	27
Linking to Another Database	33
Linking to a SharePoint Site	36
Other Types of Linked Documents	38
Creating a Hyperlink	39
Unit 1: Review Questions	41
UNIT 2: Working with Tables	43
2.1: Customizing Tables	44
Understanding Field Properties	44
Adding a Primary Key to a Table	45
Indexing a Field	47
Inserting, Deleting, and Moving Fields	49
Importing a Table from another Source	52

2.2: Formatting Tables	54
Formatting Number Fields	54
Formatting Text Fields	56
Adding Field Descriptions.....	57
Changing Field Data Types.....	58
Adding Captions.....	59
2.3: Controlling Table Data Entry.....	60
Setting a Default Value	60
Setting a Required Value.....	61
Creating and Using Input Masks	63
Creating and Removing Table Relationships	66
2.4: Managing Table Data Entry.....	73
Using the Table Design Ribbon.....	73
How to Validate Data	74
Creating a Lookup Field.....	77
Modifying a Lookup Field	84
Creating a Value List.....	85
Modifying a Value List	89
Unit 2: Review Questions	90
UNIT3: Working with Forms.....	92
3.1: Basic Form Controls	93
Adding a Control.....	93
Using the Control Wizard.....	102
Cutting, Copying, Pasting, and Moving a Control	103
Formatting a Control.....	108
3.2: Advanced Form Controls.....	109
Modifying a Control's Properties.....	109
Changing a Control's Data Source.....	112
Changing a Control's Default Value	114
Creating a Calculated Control.....	115
Using Form Properties	118
3.3: Formatting Your Form	119
Formatting Gridlines.....	119

Modifying the Font	120
Adding Logos	123
Changing the Layout	124
3.4: Formatting Controls.....	126
Changing the Color of a Control	126
Using Control Properties	127
Aligning Controls	128
Applying Special Effects.....	131
3.5: Formatting Records.....	133
Modifying Fonts	133
Using AutoFormat	134
Using the Format Ribbon.....	136
Using the Arrange Ribbon	138
Unit 3: Review Questions	139
UNIT 4: Working with Reports	142
4.1: Organizing Report Data	143
Adding and Removing Fields	143
Using Report Sections	147
Changing Section Properties.....	149
Grouping and Sorting in a Report	149
Changing Group Properties	154
Using Calculated Controls in a Report.....	156
Lesson 4.2: Formatting Reports	157
Formatting Gridlines.....	157
Modifying the Font	159
Adding Logos	159
Changing the Layout.....	160
4.3: Common Report Tasks	163
Adding a Photo	163
Adjusting Page Setup	164
Adding Headers and Footers	166
Adding Page Numbers	167
Using the Label Wizard	167

Unit 4: Review Questions	173
UNIT 5: Working with Queries.....	176
5.1: Basic Queries	177
Review of Queries	177
Creating a Query	177
Sorting a Query.....	185
Filtering a Query	187
Hiding Fields	193
Using AND OR Operators	194
Use of IIF Functions.....	197
5.2: Multiple Table Queries	198
Creating a Multiple Table Query.....	198
Creating a Calculated Field.....	200
Using the Expression Builder.....	202
Using Queries to Summarize.....	203
5.3: Advanced Queries.....	206
Creating a Parameter Query	206
Using Parameter Queries	207
Creating Crosstab Queries.....	208
Using Crosstab Queries.....	214
Using Make-Table Queries	215
5.4: Management (Action) Queries.....	218
Append Queries.....	218
Delete Queries.....	221
Update Queries	224
Exporting Queries	226
Unit 5: Review Questions	228
Index.....	230

Unit 1: Advanced File Tasks

1.1: Database Management

We often hear the phrase “The best defence is a good offence.” Every once in a while you will encounter technical difficulties when working with Access that are beyond your control. You might be working with your database when the power goes out or you have an equipment failure with your machine.

Fortunately, Access has fairly robust error detection and correction services when something goes wrong. Every time you open a file in Access, certain parts of the file are checked to ensure consistency. If an error is encountered, Access will attempt to repair the damaged or missing sections of data as best it can.

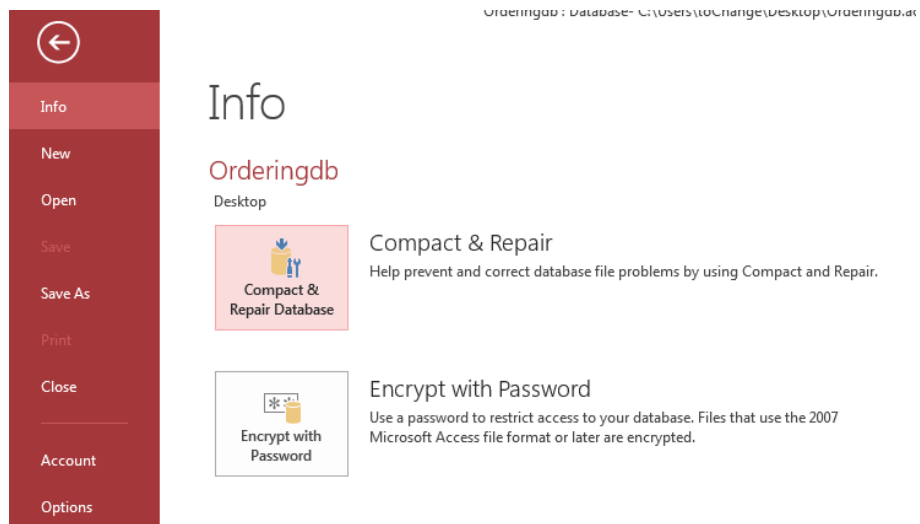
Compact and Repair a Database

Much of Access’ repair functionality is taken care of automatically. If a corrupt file is detected, Access will attempt to repair it in the background or at least try to salvage the parts of the database file that are still usable.

If a system crash or power outage causes Access to shut down completely, Access creates a backup file of the one you were working on. The file is named filename_Backup.accdb (where “filename” is the name of the file you were working on prior to the crash) and the file is stored in the same folder as the original backup file. Open the database backup file and Access will attempt to restore the database back to its full capacity.

If you have a very large database or have done a lot of maintenance to your database, the file you are working on can become fragmented. If you deleted several records from a very large table, Access can compact the file together to eliminate wasted space. This will increase the performance of data retrieval and processing time if the computer doesn’t have to skip over empty spaces. (If you have ever defragmented a hard drive, the principle is the same.)

To compact and repair a file, open the file in Access. Once the file is opened, click File, Info, Compact & Repair Database.

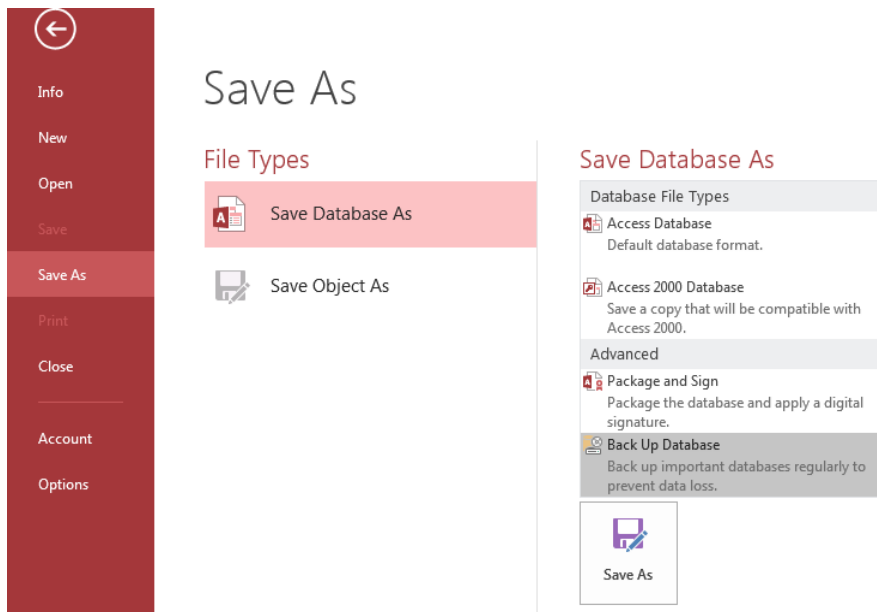


Access also performs a few consistency checks on the data to make sure the current file is not corrupted and will attempt to fix any problems.

Backing up Your Database

It is smart computing to back up your database on a regular and frequent schedule. Most corporate databases are backed up at least once a day, usually at nighttime to minimize the effect on business. Backing up data in Access is easy to do.

Click the File, Save As and click Save Database As Back Up Database.



When the Save Backup As dialogue box appears, Access gives the file a default name of filename_today's-date where filename is the name of the current file you are working on. Give the file another name if you like and click Save.

A backed up file works exactly the same way as a normal database file, so if you ever have to use it, open it as you would any other database file.

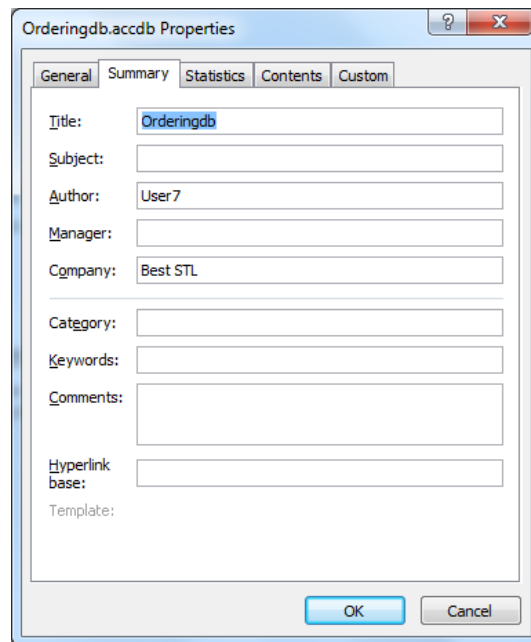
Editing Database Properties

Access gives you the ability to adjust the file properties of a particular database file.

To see the properties of a database, first open a database, and click

File, Info, and click the link View and Edit Database Properties.

There are five tabs across the top of the window:



General The General tab gives a quick biography of the file, including where it is saved, how big it is, and when it was last modified.

Summary The Summary tab allows you to fill in details about the person/organization that owns or uses the file. We will explore this tab later.

Statistics Statistics are kept about when the file was created, last modified, last accessed, and last printed. It also records which user made the last modifications, what revision number the database is, and how long it has been worked on since creation.

Contents The Contents tab summarizes the contents of the database file giving the name of each table, query, report, etc.

Custom

The Custom tab allows you to create a custom property to the database. For example, if you made a file and want to let others know how to reach you if they have a question, you can add your own phone number to the file properties.

1.2: Saving Your Files

Much of the file management functionality of Access takes place in the background and automatically saves most changes you make to a database. When Access does not save something for you automatically, you will be prompted asking if you want to save the changes to a particular object.

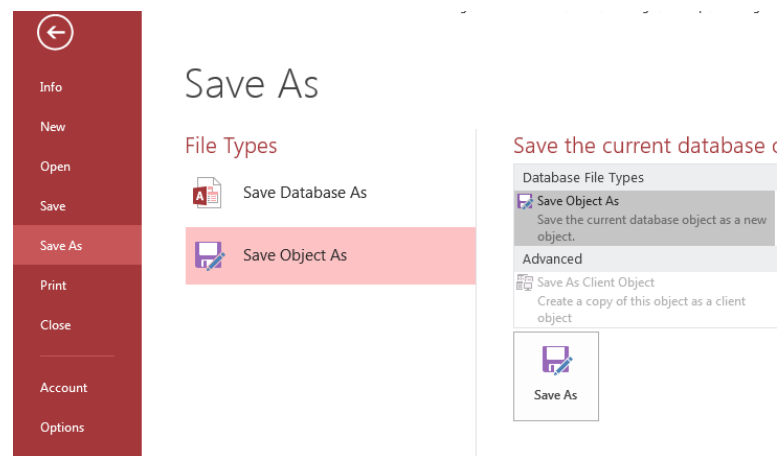
However, Access does give you a bit of flexibility when it comes to saving different objects. We will explore this saving functionality in this lesson.

Using the Save As Dialogue

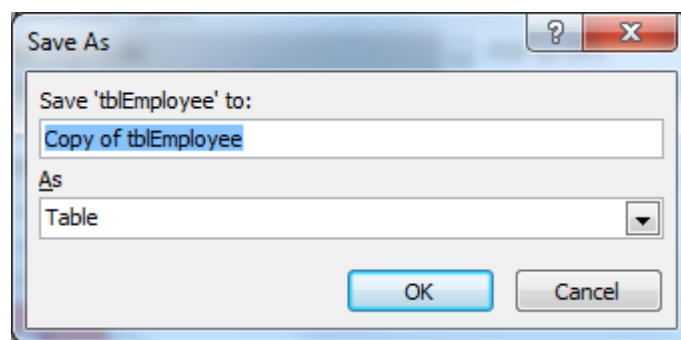
We know that most things in Access are saved automatically, but you can perform a manual save of a particular database object. For example, consider the Employees table of the Northwind sample database:

Home		Employees		
	ID	Company	First Name	Last Name
+	1	Northwind Traders	Nancy	Freehafer
+	2	Northwind Traders	Andrew	Cencini
+	3	Northwind Traders	Jan	Kotas
+	4	Northwind Traders	Mariya	Sergienko
+	5	Northwind Traders	Steven	Thorpe
+	6	Northwind Traders	Michael	Neipper
+	7	Northwind Traders	Robert	Zare
+	8	Northwind Traders	Laura	Giussani
+	9	Northwind Traders	Anne	Hellung-Larse
*	#####			

Click File Menu, Save As:



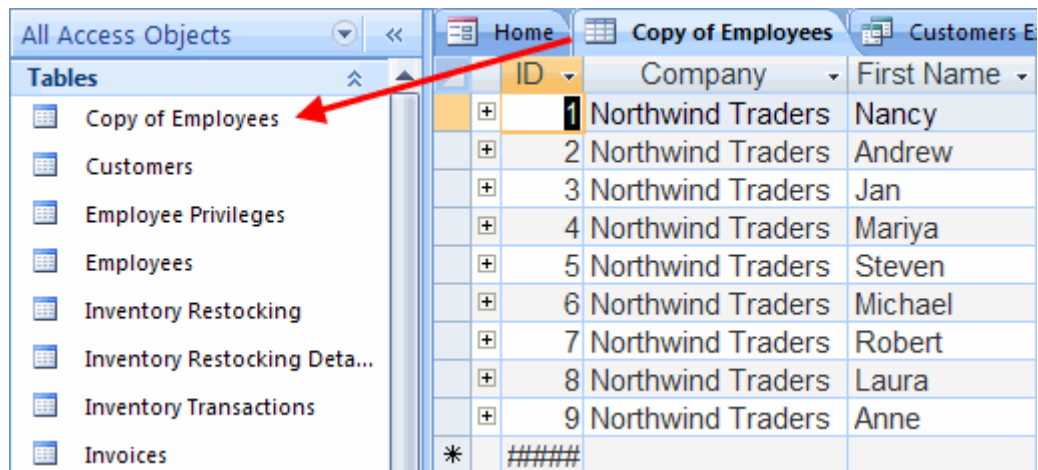
After choosing Save Object As, the following Save As dialogue box will appear:



In this example, you have the ability to save the Employees table as another table (which will make a copy), query, form, or report. Give the new object a name and then click the pull-down arrow beside the As combo box to see the choices. Remember, you can always save a copy of the object as the same type of object (table as table, form as form, etc.).

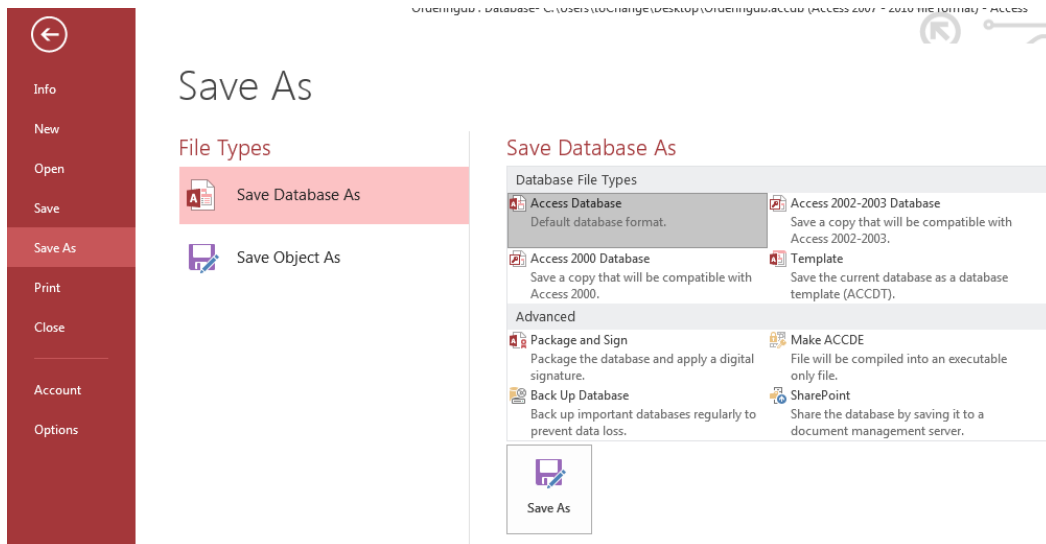
Object	What Objects you can Save As
Tables	Table, Query, Form, Report
Queries	Query, Form, Report
Forms	Form, Report

Once you have saved the new object you can access it in the Navigation Pane:



Using the Save As Menu

There is more to the Save As command in the Office Menu than simply copying one object to another or making a duplicate. Click the right-facing arrow beside the Save As command to see more options:



Access gives you two sections of commands to choose from: Save the current database object and Save the database in another format.

Let's look at each of the options.

Save Object As

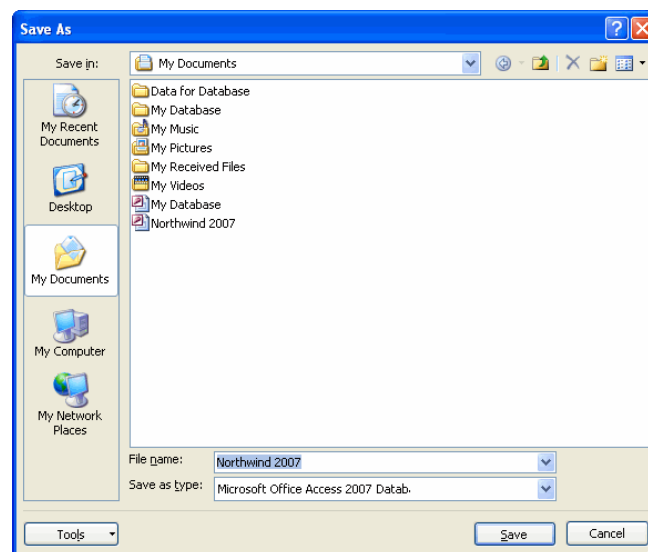
This command is the same as clicking the Save As command in the Office Menu directly. Enter a new name and choose a data type to save the file under.

PDF or XPS

This command gives you the ability to reproduce the current database object as a PDF (Portable Document Format) or XPS (XML Paper Specification). This command is only available if you have installed the appropriate add-in. (See Lesson 1.4 for more information.)

Access Database

Access will close all currently open database objects and then open the Save As dialogue box. Choose a save location and new file name and click Save.



Access 2002-2003 File Format

Access uses a new file structure to save files. The file format is not directly backwards compatible with previous versions of Access. However, it can be made to save files in any other

Access 2000 Database

version of Access if necessary.

Using AutoRecover

AutoRecover is a background process in Access that makes a backup copy of the file you are currently working on. Access, by default, saves the current working file every ten minutes. If your computer encounters a problem and Access has to close, your database will be restored the next time Access is opened.

Unit 1.3: Exporting Files

One of the features about the Microsoft Office package is the ability to share and use data between one program and another. Access also has the ability to export and import data to and from non-Microsoft products such as Lotus and Corel applications.

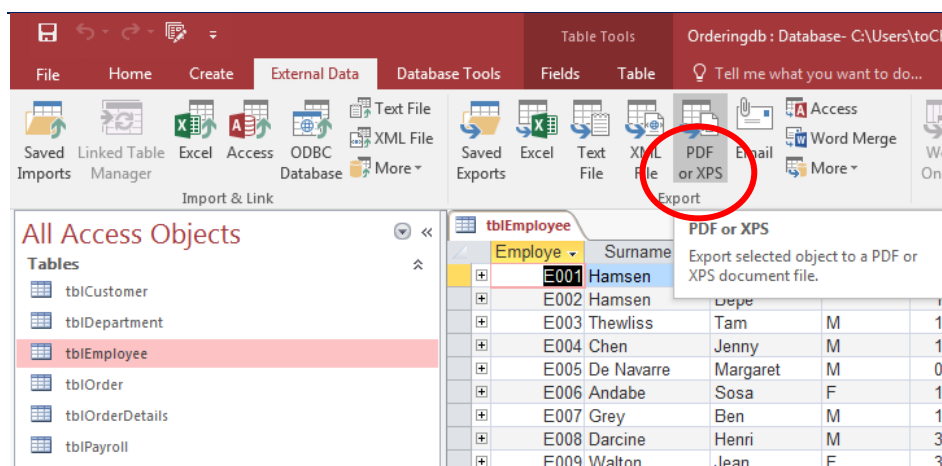
In this lesson we will learn how to export to a few different programs in the Office software package.

Exporting to PDF or XPS

To export a table to PDF format

Select the table and choose the External Data tab

Click PDF or XPS format.



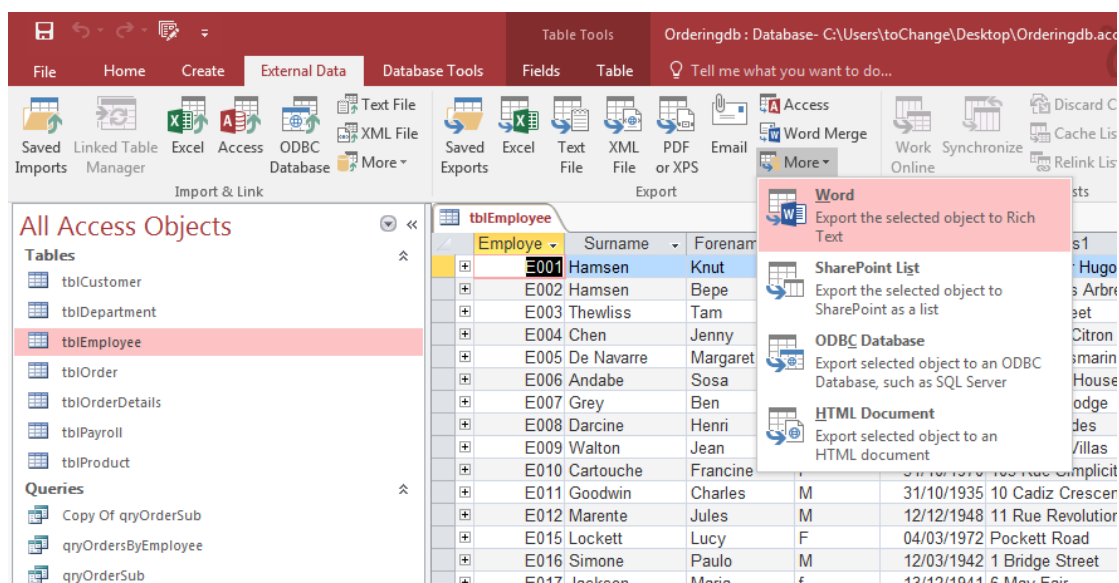
If you click on this option, you will see a **Publish as PDF or XPS** dialogue box.

Exporting to Word or Excel

Microsoft Word is a word processing program that can view a table, form, or report that has been exported by Access in RTF (Rich Text Format) form. The RTF file format retains any formatting you might have applied to the datasheet, form, or report like fonts and styles.

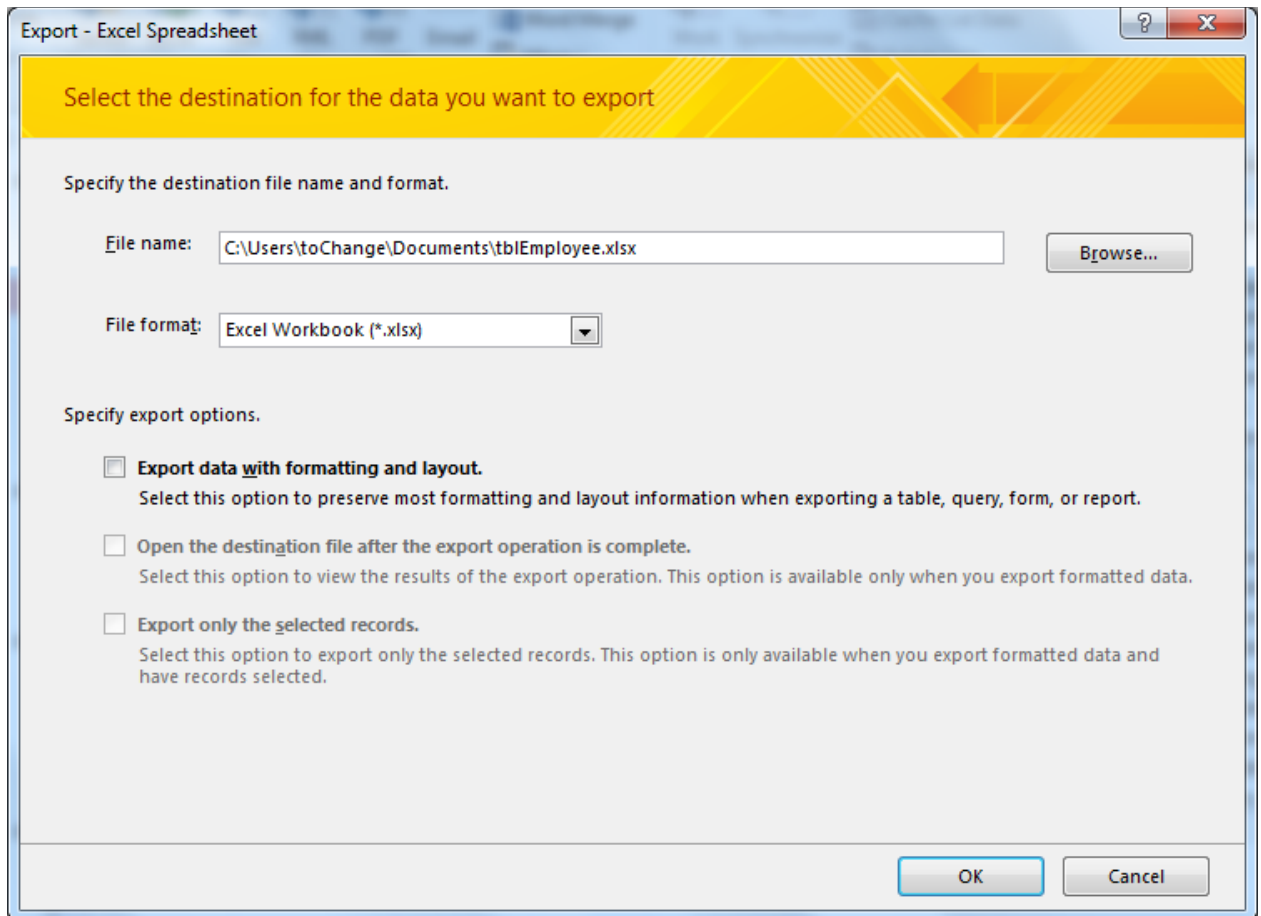
If you have ever used Excel or another spreadsheet program before, you will recognize Datasheet view as being very similar to data contained in a spreadsheet. Therefore, Access can export a table in Datasheet view as an XLS (Excel Spreadsheet) file.

Click the External Data command tab to see the Export section of the ribbon. The commands for exporting the current table as an Excel file or Word file are visible: To export to Word, select External Data, More, Word.



To export to Excel, select External Data, Excel.

Excel Spreadsheet dialogue box will appear:



Click the Browse button to select a location where you want to save the file. (By default the file will be saved in the My Documents folder.) Click the File format combo box to select the desired Excel file format. It is important that you select the proper type of file format in order to properly use the Excel file. For example, the default .xlsx (Excel) format will not work with Excel 97-2003. Therefore, select the proper output type before clicking the OK button.

If you wish, you can also select the check boxes allowing Access to try and preserve as many formatting and layout changes as possible in order to minimize the time needed to 'fix' the file in the destination program:

Specify export options.

☒ **Export data with formatting and layout.**

Select this option to preserve most formatting and layout information when exporting a table, query, form, or report.

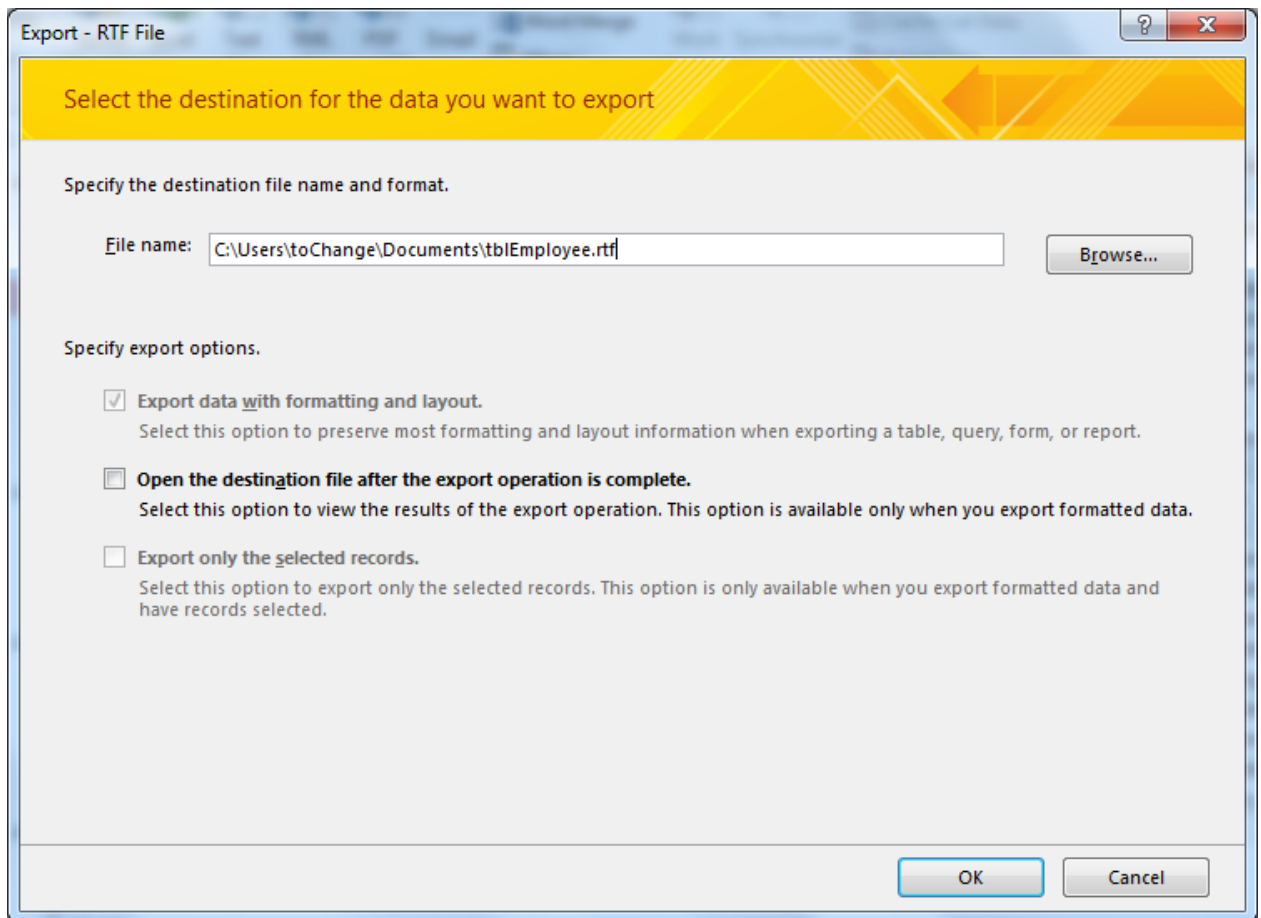
☒ **Open the destination file after the export operation is complete.**

Select this option to view the results of the export operation. This option is available only when you export formatted data.

The exported table can now be opened in the proper version of Excel:

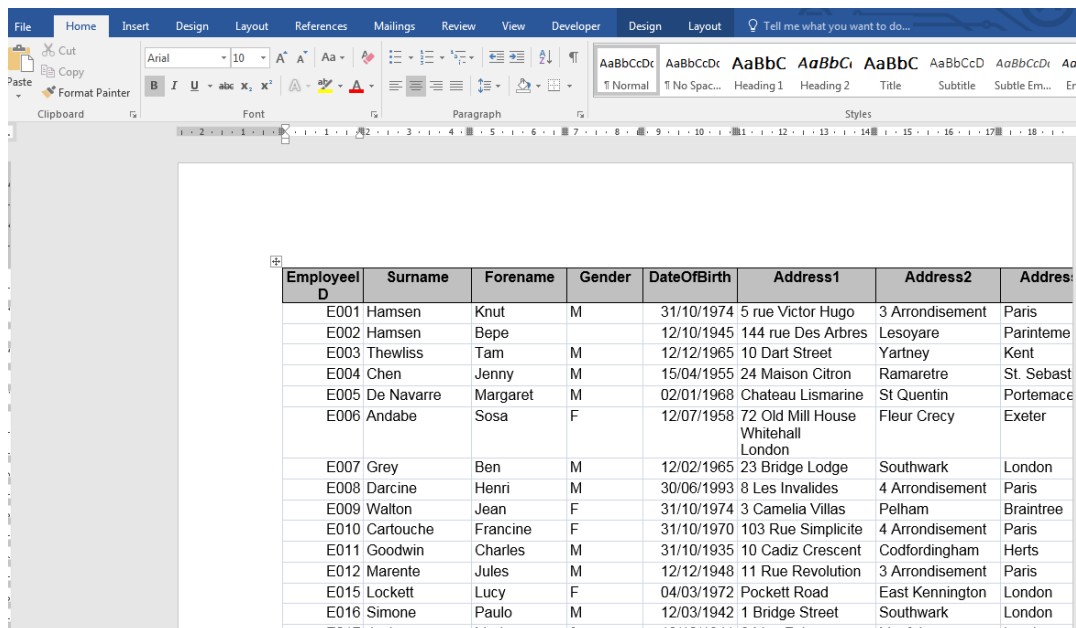
Microsoft Excel - Purchase Order Details					
File Edit View Insert Format Tools Data Window Help					
A1 ID					
	A	B	C	D	E
1	ID	Purchase Order ID	Product	Quantity	Unit Cost
2	238	90	Northwind Traders Chai	40	\$14.00
3	239	91	Northwind Traders Syrup	100	\$8.00
4	240	91	Northwind Traders Cajun Seasoning	40	\$16.00
5	241	91	Northwind Traders Olive Oil	40	\$16.00
6	242	92	Northwind Traders Boysenberry Spread	100	\$19.00
7	243	92	Northwind Traders Dried Pears	40	\$22.00
8	244	92	Northwind Traders Curry Sauce	40	\$30.00
9	245	92	Northwind Traders Walnuts	40	\$17.00
10	246	92	Northwind Traders Fruit Cocktail	40	\$29.00
11	247	92	Northwind Traders Chocolate Biscuits Mix	20	\$7.00

To export to Microsoft Word, click the Word command in the Export section of the External Data ribbon. The Export – RTF File dialogue box will appear:



Click the Browse button to export to a location other than the default My Documents folder.

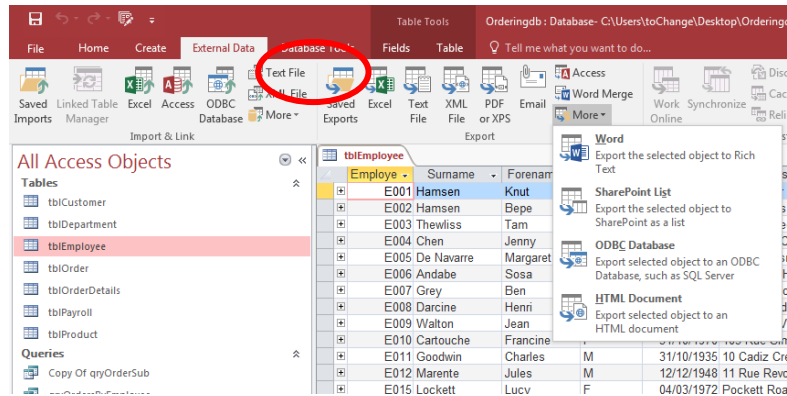
If you wish to view the file right away, check the “Open the destination file” box and click OK:



EmployeeID	Surname	Forename	Gender	DateOfBirth	Address1	Address2	Address3
E001	Hamsen	Knut	M	31/10/1974	5 rue Victor Hugo	3 Arrondissement	Paris
E002	Hamsen	Bepe		12/10/1945	144 rue Des Arbres	Lesoyare	Parinteme
E003	Thewliss	Tam	M	12/12/1965	10 Dart Street	Yartney	Kent
E004	Chen	Jenny	M	15/04/1955	24 Maison Citron	Ramaretre	St. Sebast
E005	De Navarre	Margaret	M	02/01/1968	Chateau Lismarine	St Quentin	Portemace
E006	Andabe	Sosa	F	12/07/1958	72 Old Mill House Whitehall London	Fleur Crecy	Exeter
E007	Grey	Ben	M	12/02/1965	23 Bridge Lodge	Southwark	London
E008	Darcine	Henri	M	30/06/1993	8 Les Invalides	4 Arrondissement	Paris
E009	Walton	Jean	F	31/10/1974	3 Camelia Villas	Pelham	Braintree
E010	Cartouche	Francine	F	31/10/1970	103 Rue Simplicite	4 Arrondissement	Paris
E011	Goodwin	Charles	M	31/10/1935	10 Cadiz Crescent	Codfordingham	Herts
E012	Marente	Jules	M	12/12/1948	11 Rue Revolution	3 Arrondissement	Paris
E015	Lockett	Lucy	F	04/03/1972	Pockett Road	East Kennington	London
E016	Simone	Paulo	M	12/03/1942	1 Bridge Street	Southwark	London

Exporting to Other Destinations

Access can export data to many other programs than just Word and Excel. Just use the commands in the Export section of the External Data ribbon. (Note that the options will be different depending on which object you have selected.)



Access can export an object as a plain Text File which is very small in size and with very basic formatting.

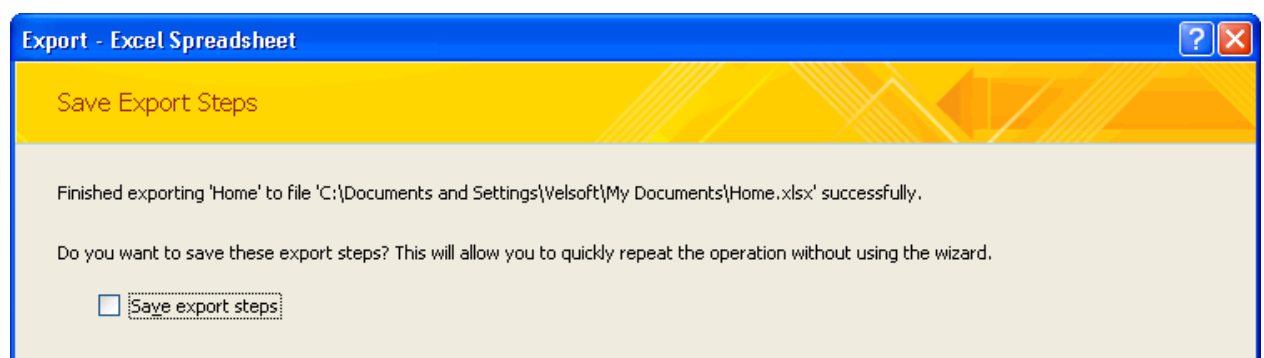
The example below contains data that has been 'delimited' (each piece of data separated by some symbol) by commas:

Sample export format:	
1	238,90,1,40,\$14.0000,1/22/2006 0:00:00,1,59
2	239,91,3,100,\$8.0000,1/22/2006 0:00:00,1,54
3	240,91,4,40,\$16.0000,1/22/2006 0:00:00,1,55
4	241,91,5,40,\$16.0000,1/22/2006 0:00:00,1,56
5	242,92,6,100,\$19.0000,1/22/2006 0:00:00,1,40
6	243,92,7,40,\$22.0000,1/22/2006 0:00:00,1,41
7	244,92,8,40,\$30.0000,1/22/2006 0:00:00,1,42
8	245,92,14,40,\$17.0000,1/22/2006 0:00:00,1,43
9	246,92,17,40,\$29.0000,1/22/2006 0:00:00,1,44
10	247,92,19,20,\$7.0000,1/22/2006 0:00:00,1,45

Click the More command to expand a menu of other file types such as other database programs, XML, and HTML for Web pages. Access can also be used in conjunction with Microsoft Word to create a mailing list of people or places based on data in a database.

Using Saved Exports

Once Access completes the export operation, you have the option to save the steps taken to perform the export. For example, if you plan to export the same document to Excel several times as updates are made, this can end up saving a lot of time in the long run. Click the "Save export steps" check box after performing the Excel export:

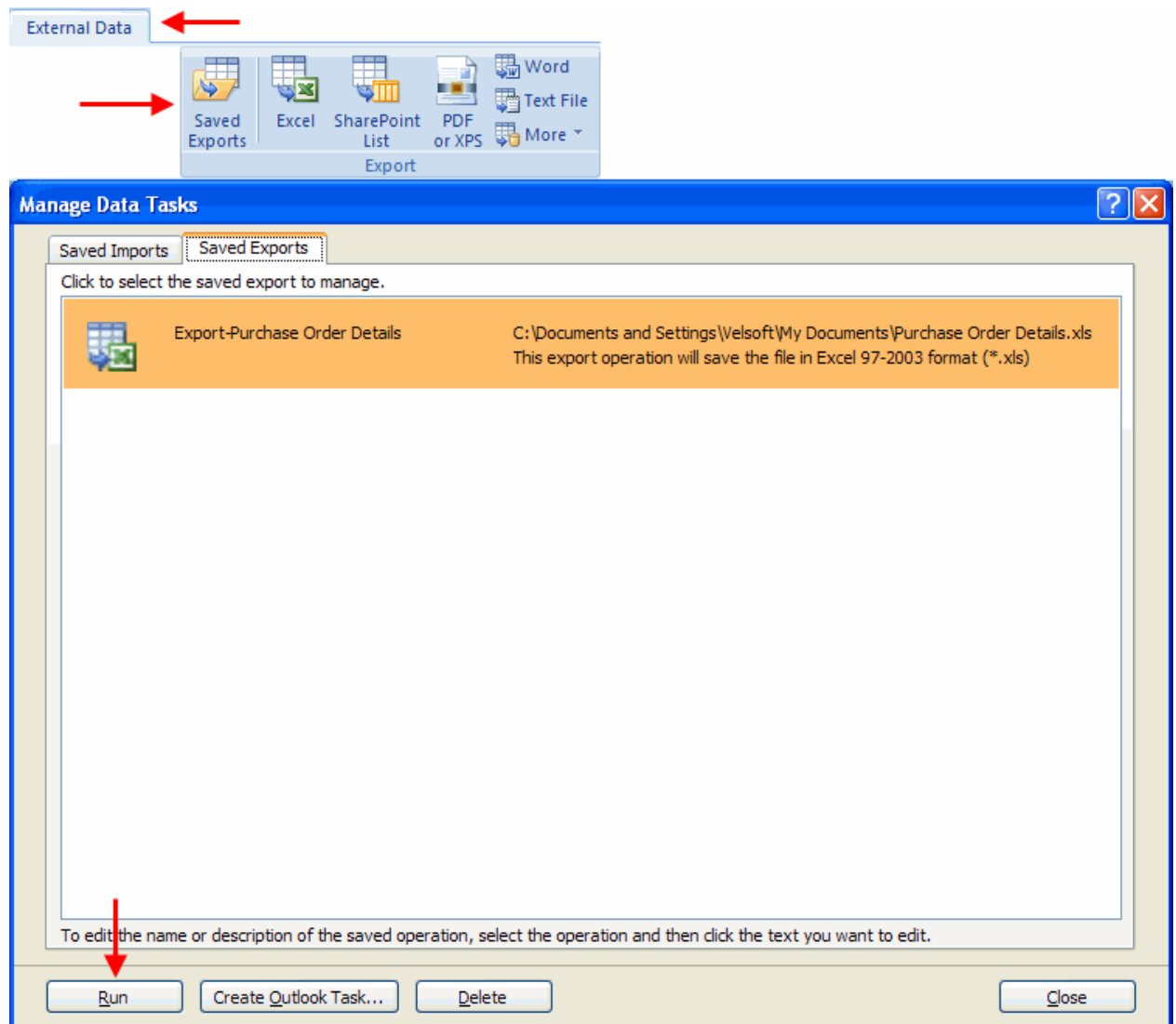


Then, name the export operation in the Save as box. You can enter a short description about the export in the Description box. You can even create a task in Microsoft Outlook to remind you to export the file at a time you specify.

The screenshot shows a Windows-style dialog box titled "Export - Excel Spreadsheet". The main area has a yellow header with the text "Save Export Steps". Below this, a message states: "Finished exporting 'Home' to file 'C:\Documents and Settings\Velsoft\My Documents\Home.xlsx' successfully." A question follows: "Do you want to save these export steps? This will allow you to quickly repeat the operation without using the wizard." There is a checked checkbox labeled "Save export steps". Below this are two text input fields: "Save as:" with the text "Export-Home" and "Description:" which is empty. Further down, a section titled "Create an Outlook Task." contains a message: "If you regularly repeat this saved operation, you can create an Outlook task that reminds you when it is time to repeat this operation. The Outlook task will include a Run Export button that runs the export operation in Access." Below this is an unchecked checkbox labeled "Create Outlook Task". A hint at the bottom reads: "Hint: To create a recurring task, open the task in Outlook and click the Recurrence button on the Task tab." At the bottom of the dialog are three buttons: "Manage Data Tasks...", "Save Export", and "Cancel".

Click Save Export to save the export operation. If you ever want to perform the operation again, click the External Data command tab.

Click the Saved Exports command in the ribbon, select the export operation you want to perform, and then click Run:



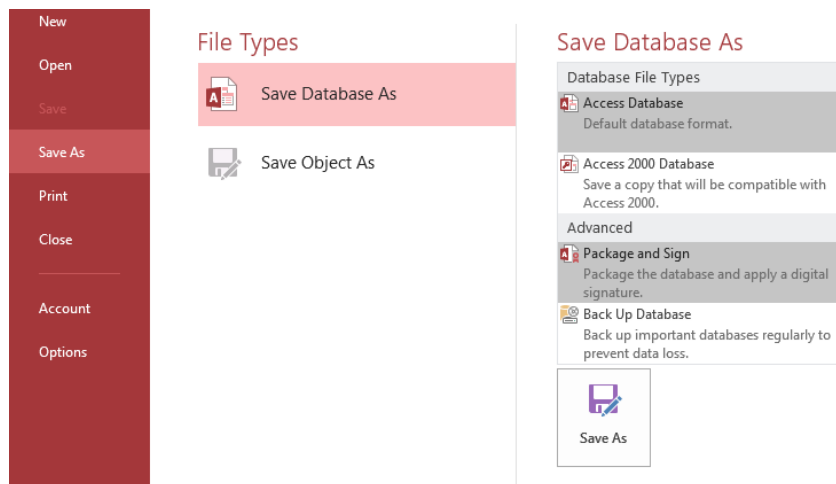
Exporting to a CAB File

Before the days of the Internet and mass data transfer through electronic means, important documents were to someone else via registered mail or (going WAY back) you would have sealed the letter in an envelope and added your own wax seal. Though times have certainly changed, the principal of sending something and having the recipient know it is from you, and only you, is still the same.

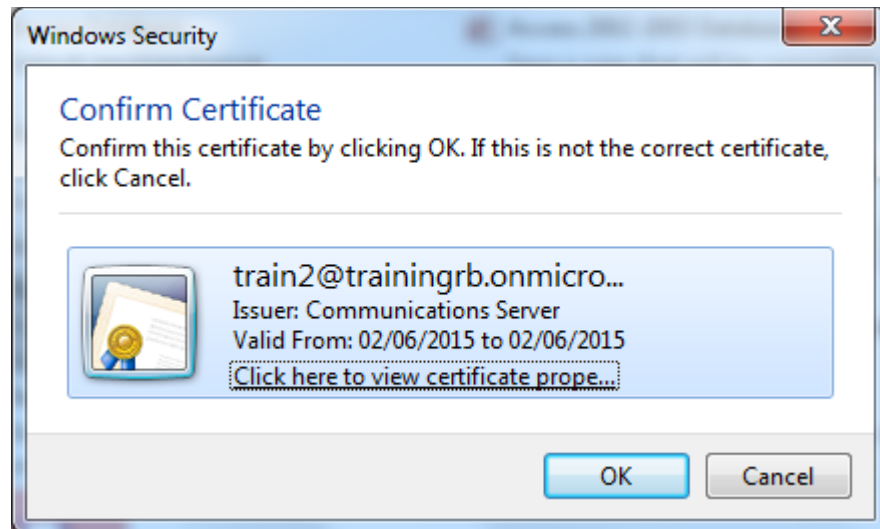
Access features the ability to place a database file into another file and then add a security certificate. The database file will be compressed into a CAB (cabinet) file which

is essentially one big unit of computer storage, just like a vault in a bank. The security certificate you provide to Access will then apply a lock and key to the file such that only the intended recipient with the appropriate key will be able to open and use the file.

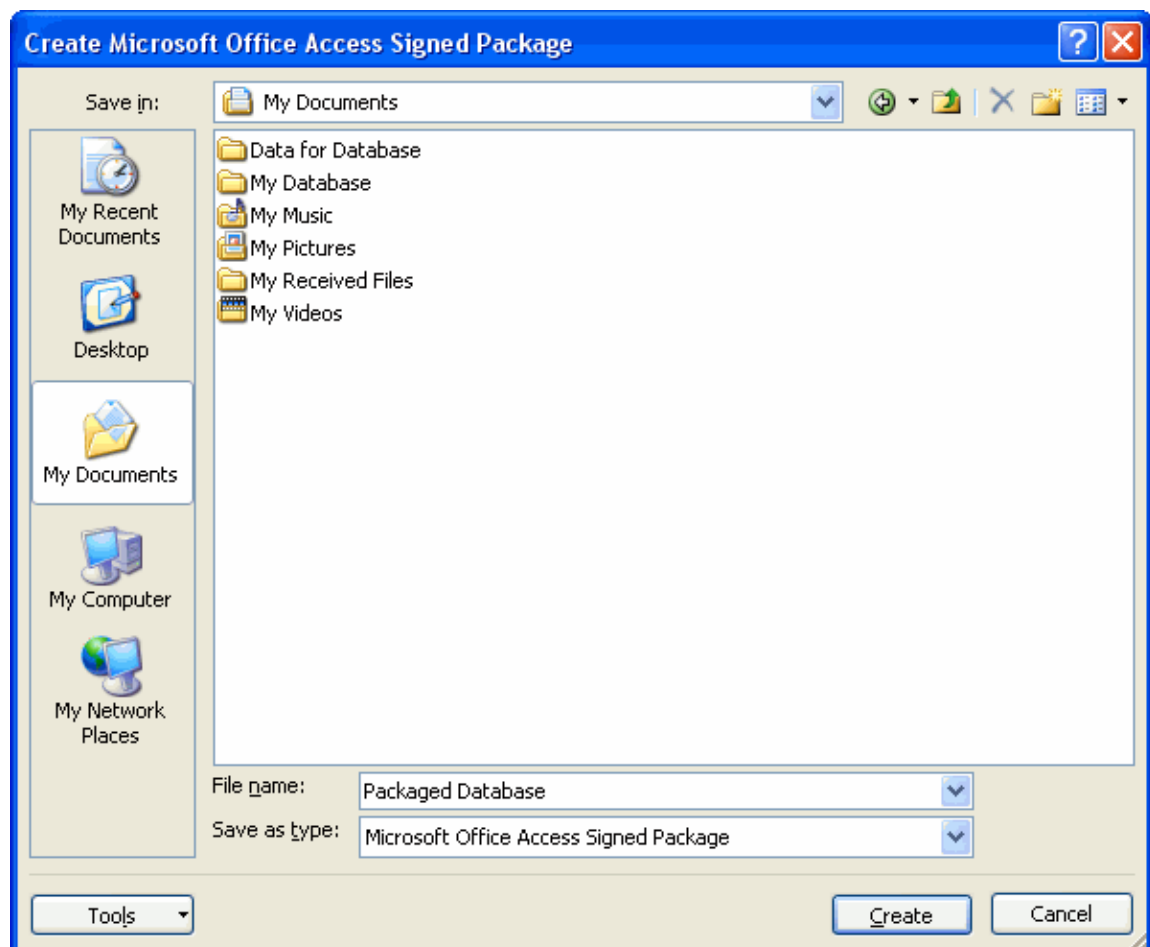
To send your database this way, click Office File, Save As, Package and Sign:



Access will prompt you to select a security certificate:



Click OK to give the package a new name and save location:



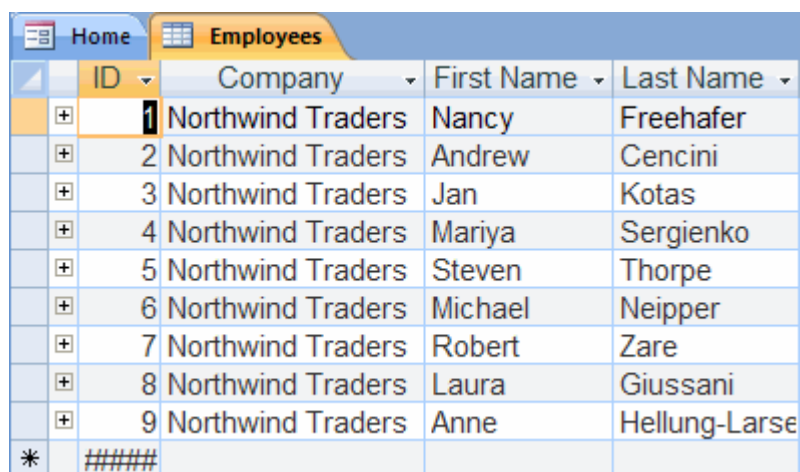
Then, click Create. The Database file will be stored on your computer as a self-contained file that can be e-mailed to another party. Depending on the nature of the

security certificate, you will need to provide certain passwords and other confidential information to the recipient in order for them to successfully open and use the package.

Exporting to Older Versions of Access

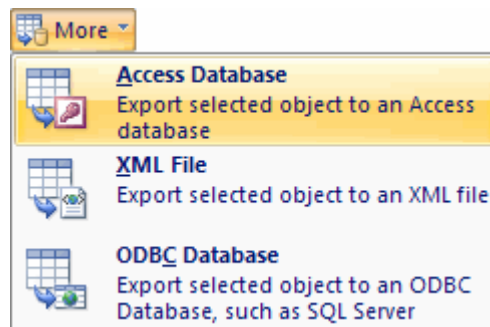
If you recall our exploration of the Save As command in the Office Menu, you know that we can save an entire database in some older Access format. This may be fine for some applications, but impractical if you only need one table of information, such as a list of employees or customers.

To export only one database object to an older version of Access, make sure the destination file is not open or being used by anyone else on your network. Open the source data object you wish to use in Access :

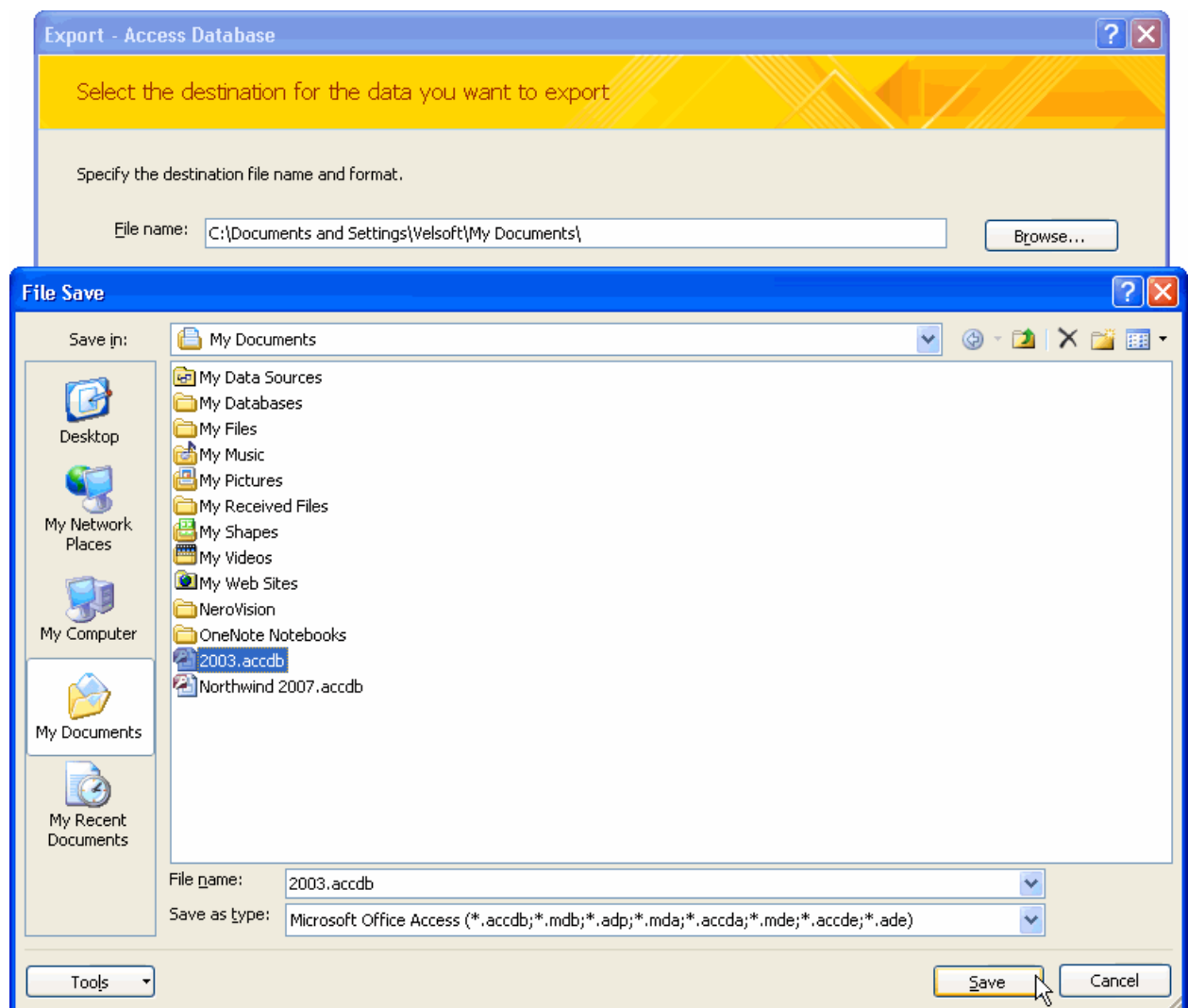


	ID	Company	First Name	Last Name
	1	Northwind Traders	Nancy	Freehafer
	2	Northwind Traders	Andrew	Cencini
	3	Northwind Traders	Jan	Kotas
	4	Northwind Traders	Mariya	Sergienko
	5	Northwind Traders	Steven	Thorpe
	6	Northwind Traders	Michael	Neipper
	7	Northwind Traders	Robert	Zare
	8	Northwind Traders	Laura	Giussani
	9	Northwind Traders	Anne	Hellung-Larse
*	#####			

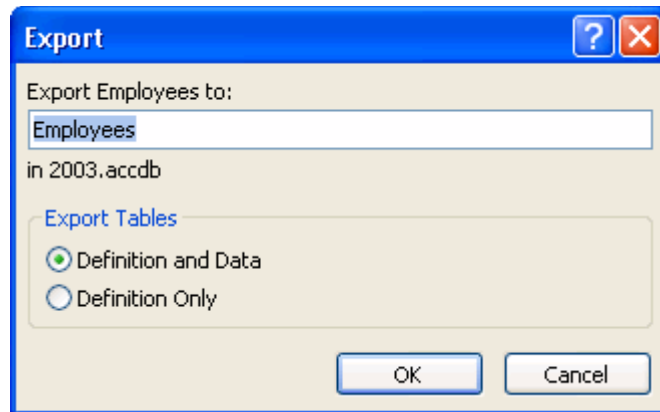
Click the More command in the Export section of the External Data ribbon and click Access Database:



The first step of the export process involves telling Access which database you want to save the object in. Click Browse and locate the destination file, then click Save:



A new Export dialog will appear asking the name of the table the data should be exported into. Make sure the name of the table is not already in use in the destination database:



Click OK to complete the operation. That's all there is to exporting data to an older version of Access! Access gives you the option to save the export operation as well. Open the older Access file version in its appropriate program to view the exported data:

Microsoft Access				
File Edit View Insert Format Records Tools Window Help				
Employees : Table				
	ID	Company	First Name	Last Name
▶	1	Northwind Traders	Nancy	Freehafer
	2	Northwind Traders	Andrew	Cencini
	3	Northwind Traders	Jan	Kotas
	4	Northwind Traders	Mariya	Sergienko
	5	Northwind Traders	Steven	Thorpe
	6	Northwind Traders	Michael	Neipper
	7	Northwind Traders	Robert	Zare
	8	Northwind Traders	Laura	Giussani
	9	Northwind Traders	Anne	Hellung-Larse
*	nber)			

Unit 1.4: Linking Files

In addition to being able to export different files and file formats, you can also link the data from Access to other applications. In this lesson we will explain how you can exchange data between Access and other programs.

Linking to an Excel Spreadsheet

We know that Access can easily export data to an Excel spreadsheet. Because of the similarities in nature between these two programs, you can easily link data from an Excel spreadsheet into an Access Database. Access and Excel have the ability to share data between one another.

For example, if you want to create weekly reports about how your business is doing using the tables and charts in Excel, you can tell Excel to get data from an external source, such as a Microsoft Access file. This way whenever the Excel file is opened, it will refresh the information it retrieved from the Access database and give up-to-the-minute results about sales.

The opposite of this is also true. If you want to generate reports based on data from an Excel file, create a link between the Access and Excel files. Access will retrieve information from the Excel file, process it, and display the information you are looking for.

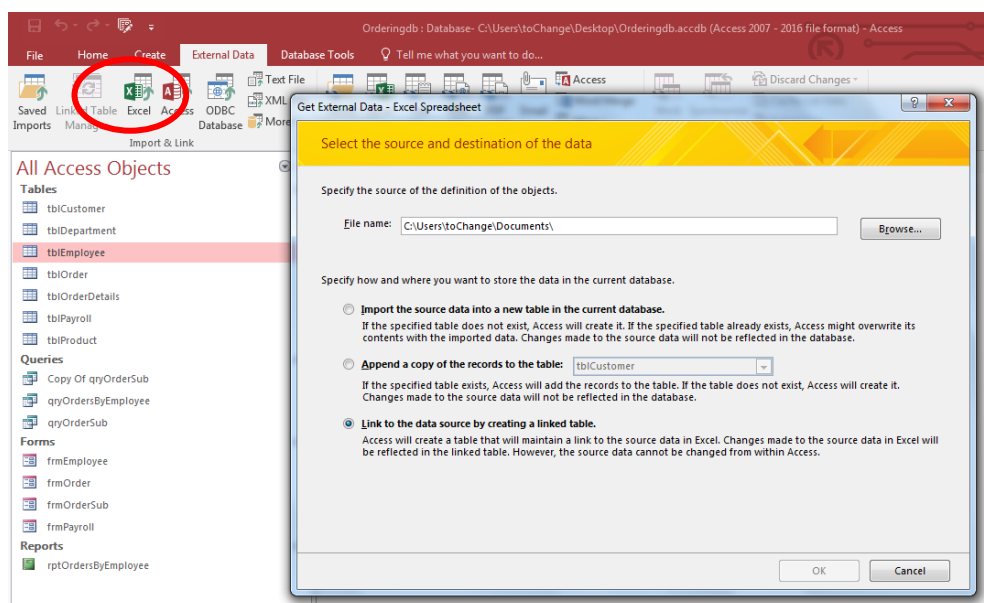
There are a few things you should do to the data in Excel before you link to Access. First, make sure all the data is neatly organized, with field headings or column headings in the source data. If the source data is organized in such a way that organizing the data into columns is not practical, specify named ranges for the data instead. (See Excel's help file for more information on named ranges.) You should also make sure that all the data in one column is the same format, meaning you should not have text and numerical data in the same column. Also note that if you have any graphics or diagrams in the Excel file, you will not be able to see them in Access.

Consider the following Excel file that has been neatly organized:

	A	B	C
1	ID	Direction	Speed
2	1	North	532
3	2	East	789
4	3	South	889
5	4	West	694

Click the Excel command in the Import section of the External Data ribbon:

The Get External Data – Excel Spreadsheet dialogue box will appear. (This dialogue box should look pretty familiar; it is designed in the same manner as the Export dialogue.) Click the Browse button to select the Excel file to which you will establish the link and choose the last option.



The second option selected above creates a lifeline to the Excel file, known as a linked table. If you make changes in the source Excel file, the changes will also be made in the Access database. You will not, however, be able to modify data in the table using Access; you may only make changes in Excel.

Once you click OK to the Get External Data dialogue, the Link Spreadsheet Wizard will appear:

Link Spreadsheet Wizard

Your spreadsheet file contains more than one worksheet or range. Which worksheet or range would you like?

☒ Show Worksheets
☐ Show Named Ranges

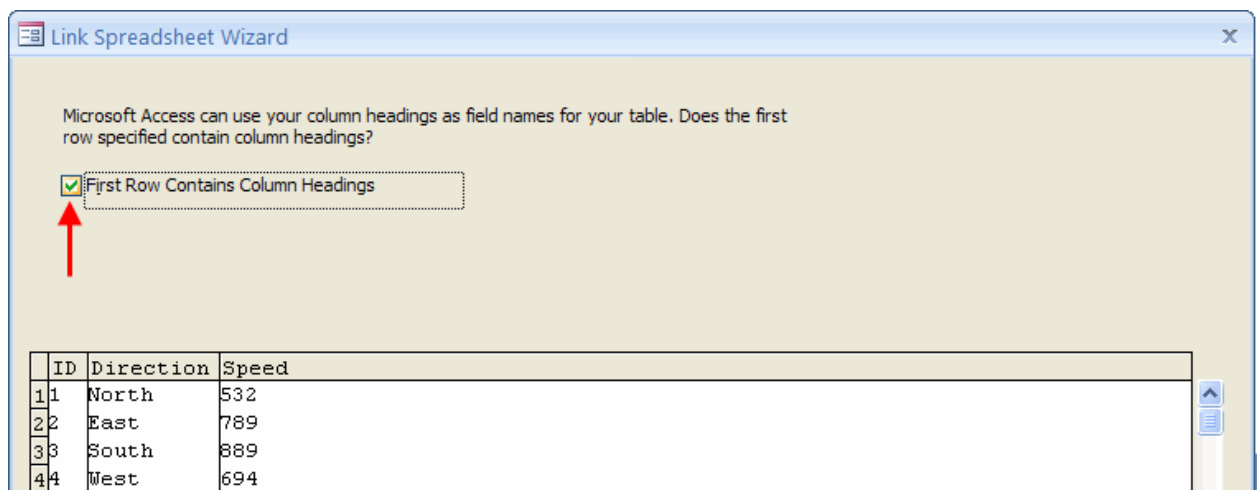
Sheet1
Sheet2
Sheet3

Sample data for worksheet 'Sheet1'.

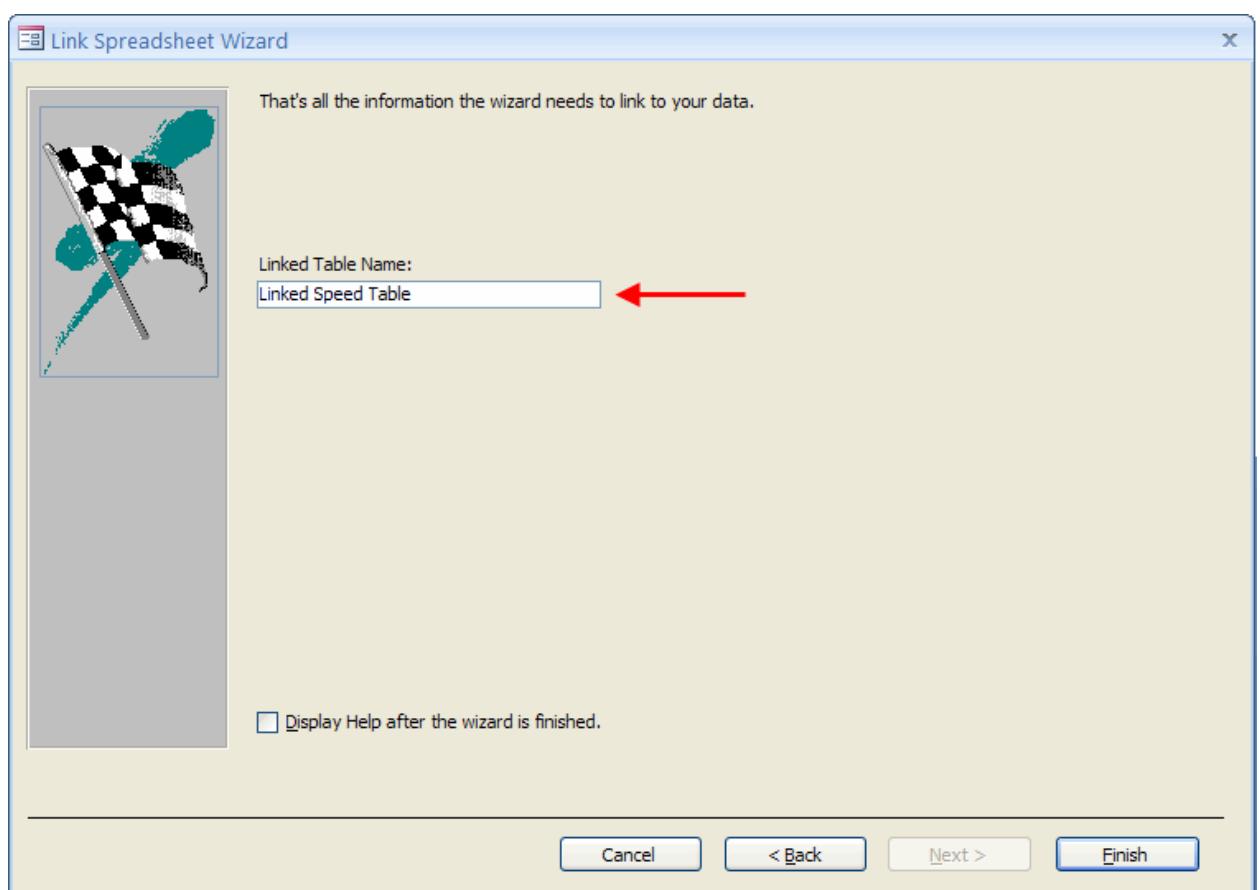
1	ID	Direction	Speed
2	1	North	532
3	2	East	789
4	3	South	889
5	4	West	694

Cancel < Back Next > Finish

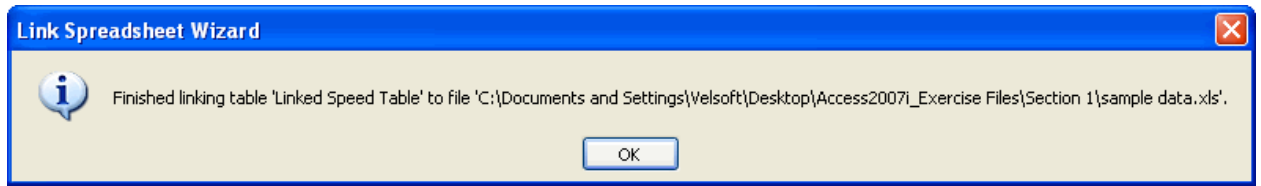
Select which data sheet or named range in the Excel file you wish to use for the linked table. The next page of the Wizard asks if the first row of data contains column headers; labels that identify the data underneath it. In this example it does, so make sure you check the check box. The preview area beneath the checkbox will show the column headers as separate:



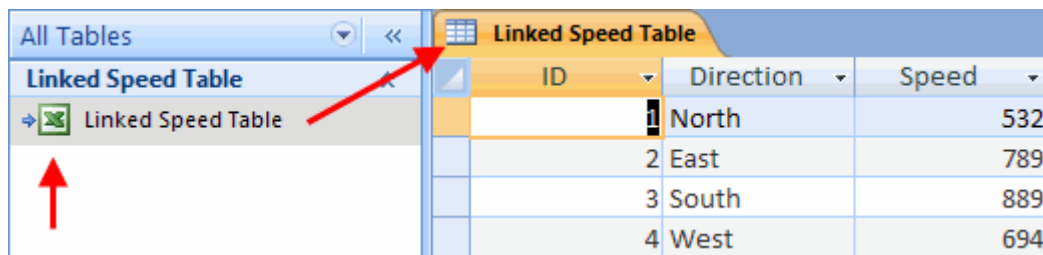
The final step of the Wizard prompts you to name the table. Be sure to give it a meaningful name!



After a moment or two, you will see a message stating Access has finished linking data from the external Excel file:

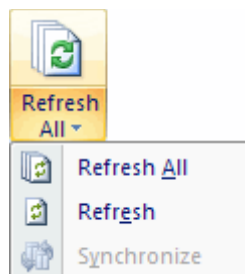


The linked table will have a special icon denoting its presence in the Navigation pane:



When a linked table is already open in Datasheet view in the Access File, you cannot open the source data file in Excel. Conversely, you cannot open the source Excel file and then open the linked table in datasheet view. Attempting to do so may cause data corruption or a program crash. However, you can close the linked table, modify the Excel source data, close the Excel source data, and then open the linked table again.

If you change the source data file, you can refresh the linked table in Access by clicking the Refresh All pull-down arrow in the Home ribbon:

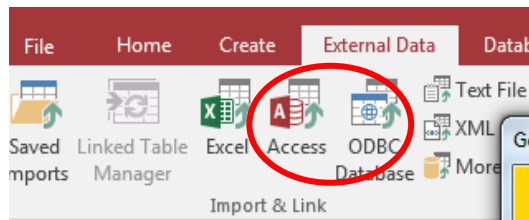


Refresh All will refresh all external data the current Access file is using. Clicking Refresh will refresh only the currently selected object.

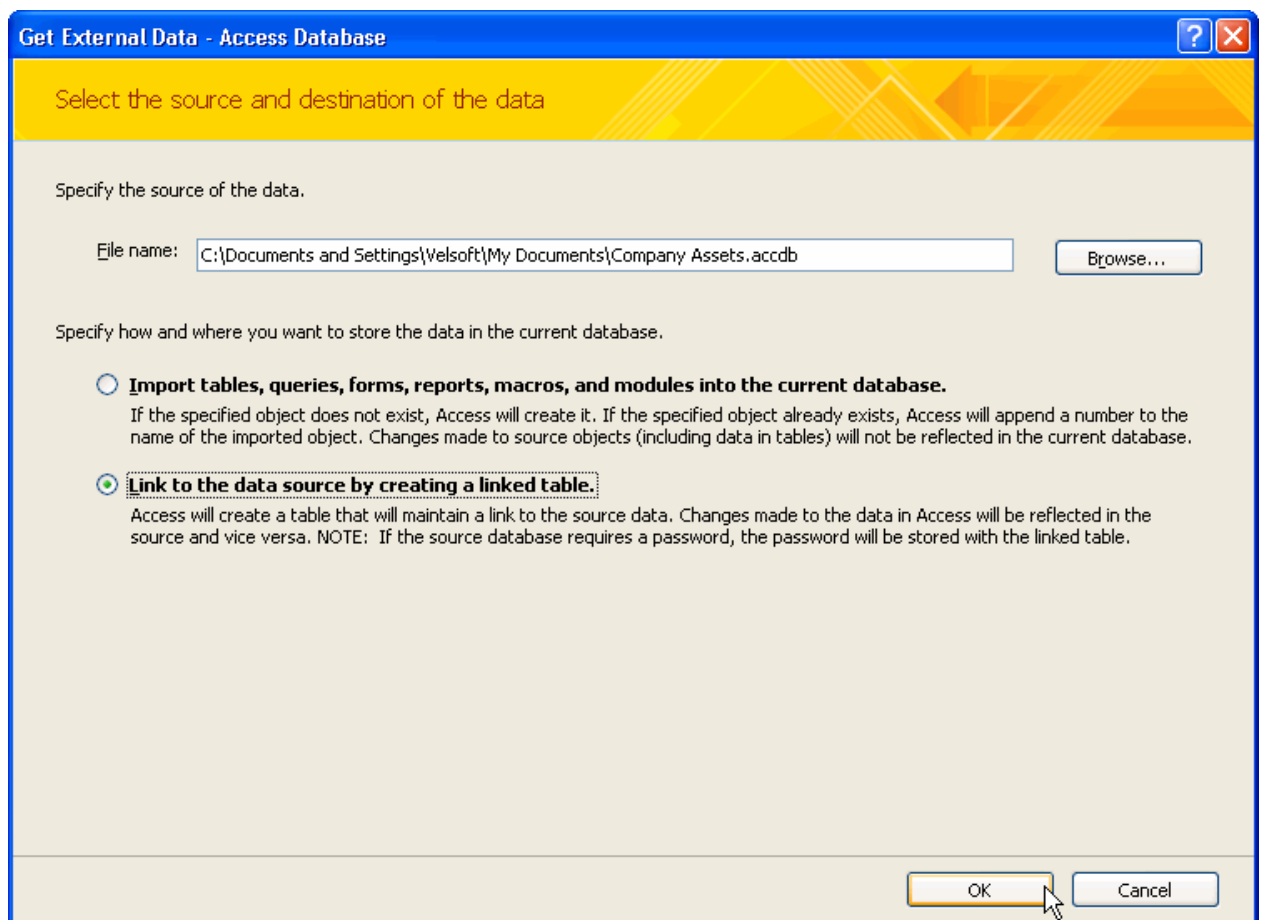
Linking to Another Database

If your organization grows larger or you find yourself needing another database to hold different information, you can link two different Access databases together. The link operation for databases is very similar to linking different spreadsheets.

Click the Access command in the Import section of the External Data ribbon:



The Get External Data – Access Database dialogue box will appear:

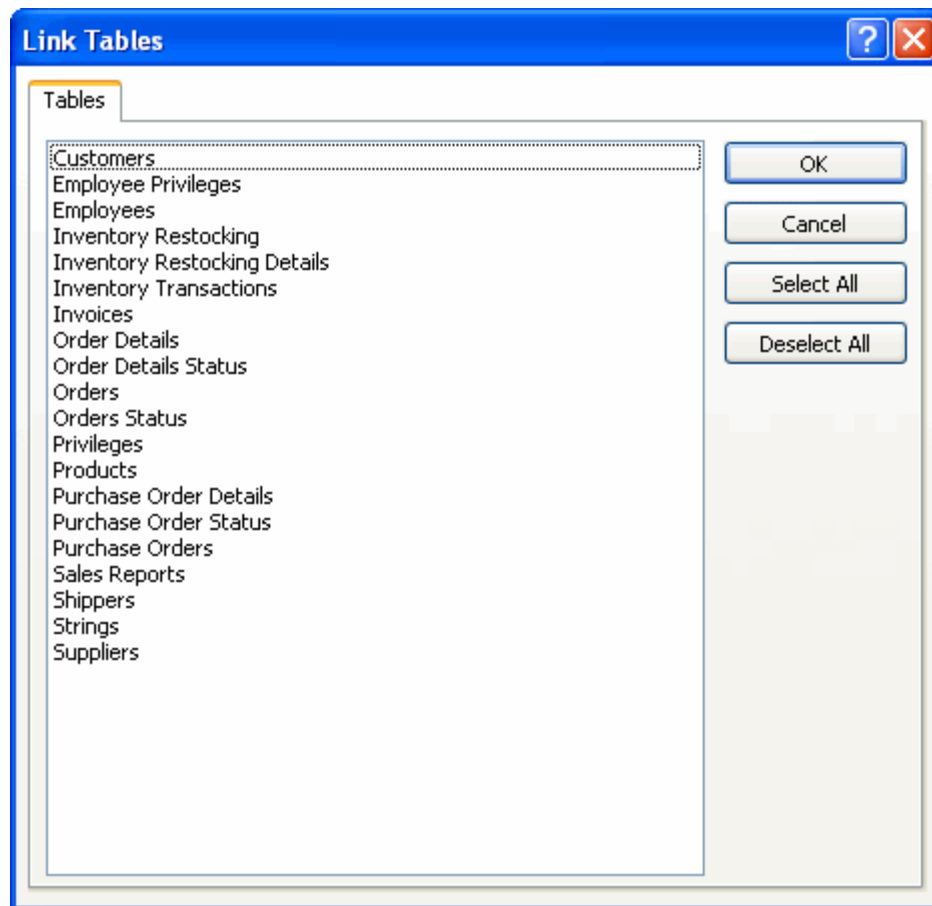


Click the Browse button to locate the database file that you want to link. Access presents you with two options pertaining to how you want to link the data.

The first option performs a standard import and does not link the data. If no database object with the same name exists, you can take a snapshot of the table, query, form, report, macro, or module from the source database and paste it into a new table. If an object with the same name already exists, Access will append a number to the name of the object you are importing. That is, if you already have an 'Employees' table, any subsequent 'Employees' table that was imported would be named 'Employees1', 'Employees2', etc.

The second option creates a linked table. If you want to make a linked table, any changes you make in the source data will be reflected in the current Access file. However, unlike links to Excel, you can make changes via a linked table to another database. Therefore, linked tables to another database are two-way; you can make changes in either.

Once you select the second option and click OK, the Link Tables dialogue box will appear:



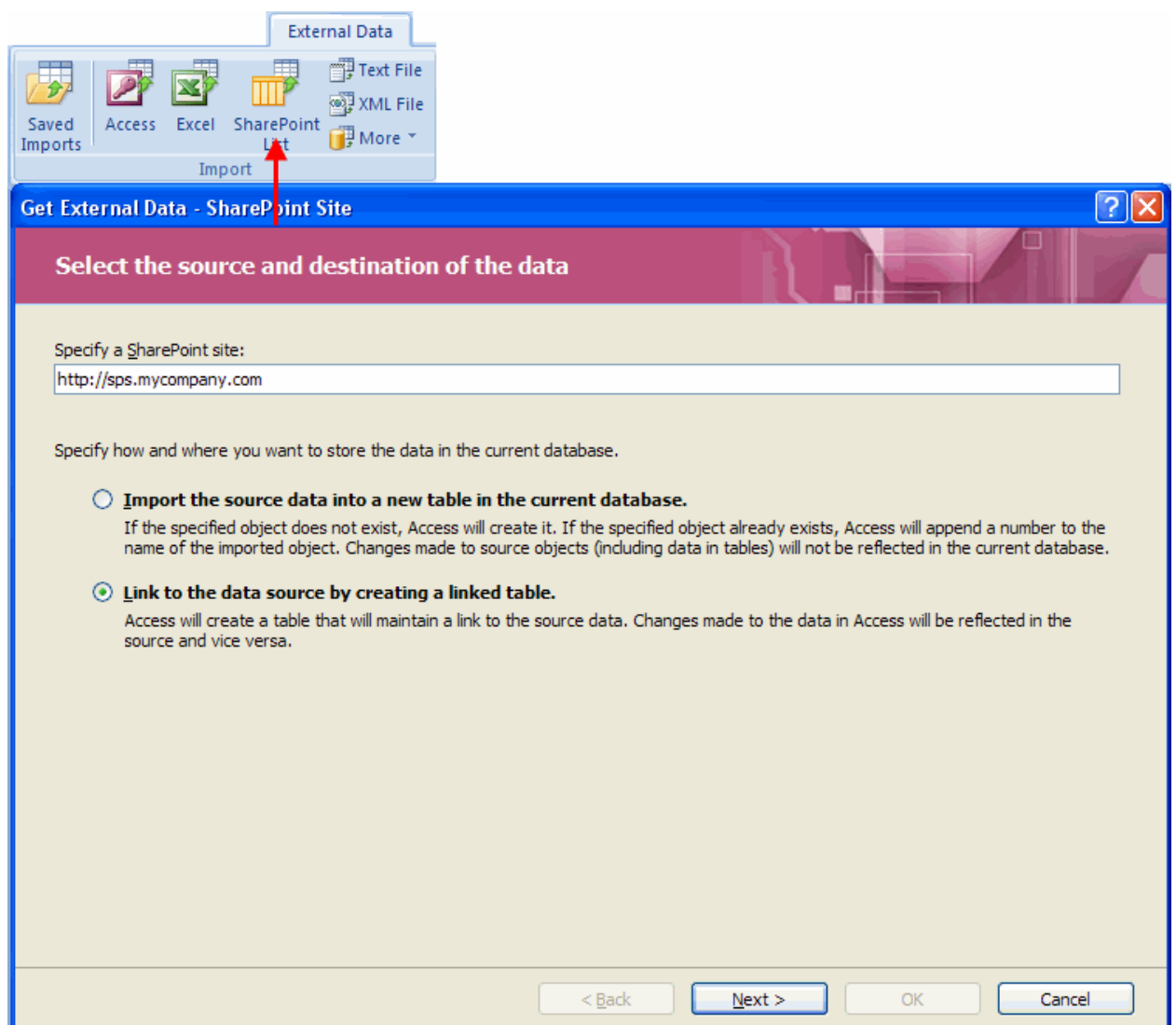
This dialogue box lets you pick one or more tables from the source database to link with. To select multiple tables, click and hold the Ctrl key as you click the table names. Click Select All to link with all tables. Once you have selected the table(s) you want, click OK and Access will establish the link:

ID	Company	First Name	Last Name
1	Northwind Traders	Nancy	Freehafer
2	Northwind Traders	Andrew	Cencini
3	Northwind Traders	Jan	Kotas
4	Northwind Traders	Mariya	Sergienko
5	Northwind Traders	Steven	Thorpe
6	Northwind Traders	Michael	Neipper
7	Northwind Traders	Robert	Zare
8	Northwind Traders	Laura	Giussani
9	Northwind Traders	Anne	Hellung-Larsen
* #####			

Linking to a SharePoint Site

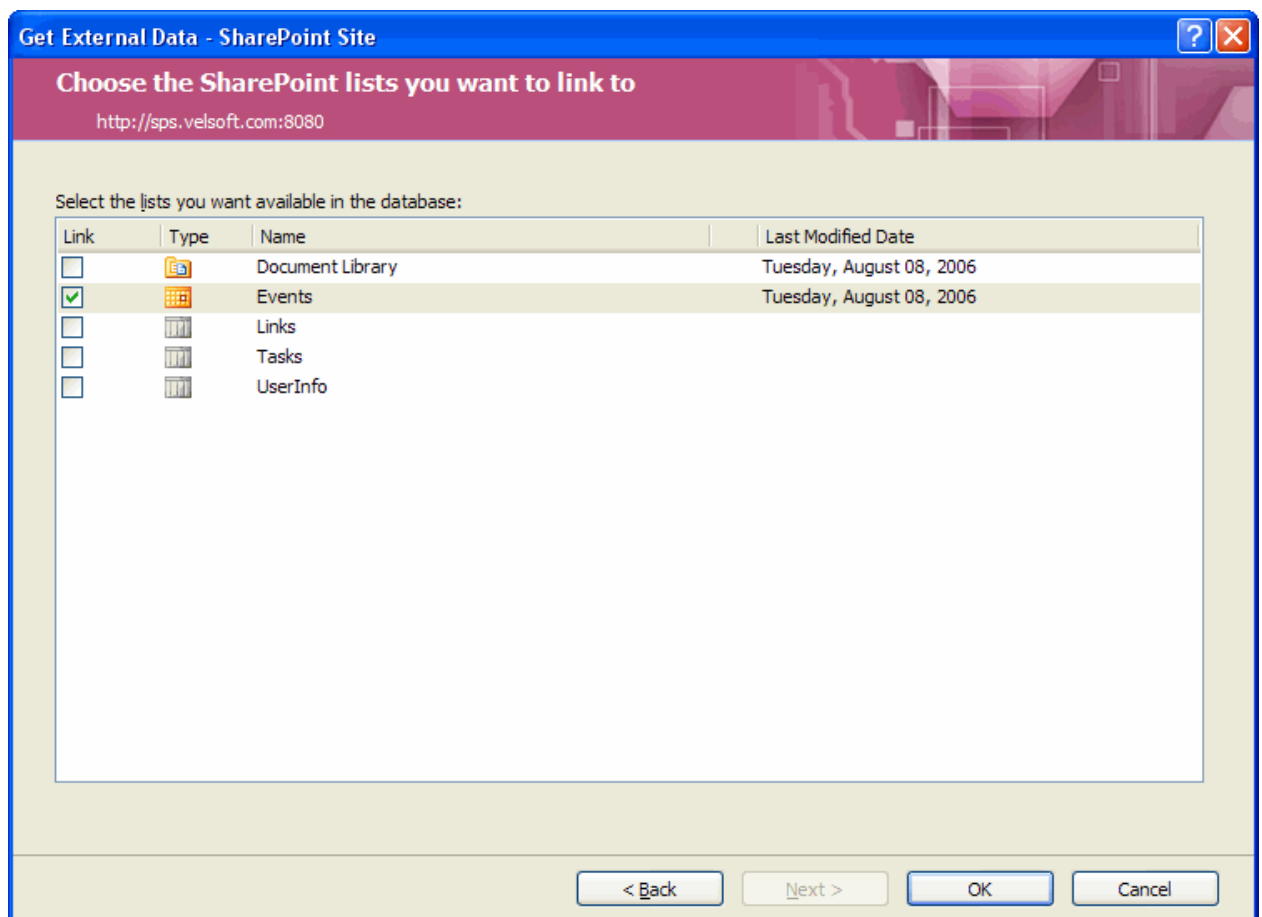
The Office package makes extensive use of the SharePoint services for data exchange. A SharePoint server is essentially a repository where different members of your organization can meet online, share files, and store documents for everyone to update and use. This saves the hassle of trying to gain permission to get through various firewalls for a direct network connection. Instead, users can meet on the public domain (protected by a password) of the Internet to exchange files.

To link to a SharePoint site, click the SharePoint List command in the Import section of the External Data ribbon. Then, enter the server that contains the shared data:



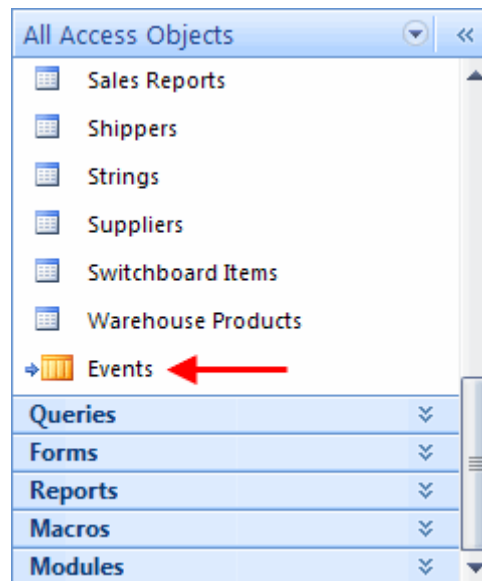
Depending on your situation, you may want to download the data to your computer. For example, if you were traveling between cities and wanted to do some work while on the plane or train, click the first radio button to download a copy of the data to your own computer.

The default option is to have your computer establish a link with the SharePoint server. Though you are limited if you have to travel, linking directly to the server will allow you up-to-the-minute information as others in your organization make changes to the central repository. You will be prompted for a user and password that would have been supplied by your system administrator. When Access connects with the SharePoint server, a list of available resources will be displayed. Choose one to link to by clicking the check box beside the listing:



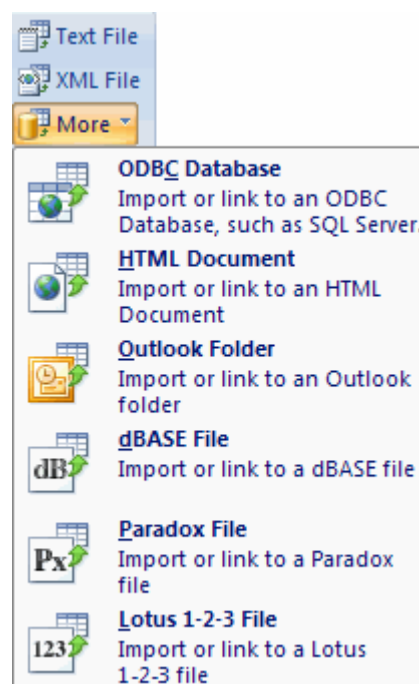
Click OK to establish the link.

The data contained in the linked resource will be displayed in the Tables section of the Navigation Pane:



Other Types of Linked Documents

Access can link with many types of files than just Excel and other Access databases. In fact you can link to almost as many files as you can import and export data to and from! Use the commands in the Import section of the External Data ribbon:



You can link to local files right on your computer such as text, XML, and HTML documents. You can reference external data sources by using the ODBC link command. You can also link to files in other database programs such as dBase and Paradox, and create a link to a Lotus 1-2-3 spreadsheet document.

Linking to external data sources not located on your computer is a bit beyond the scope of this manual. Contact your system administrator for help and information relating to using external data sources. Though the process for each is different, the principle for linking to data files is the same for each. Once a file has been located or communication has been established between Access and the external data source, Access will step through a similar Wizard that was used to link to Access and Excel files. Simply select the data or range of data you want to link with and Access will list each linked data source in the Navigation pane.

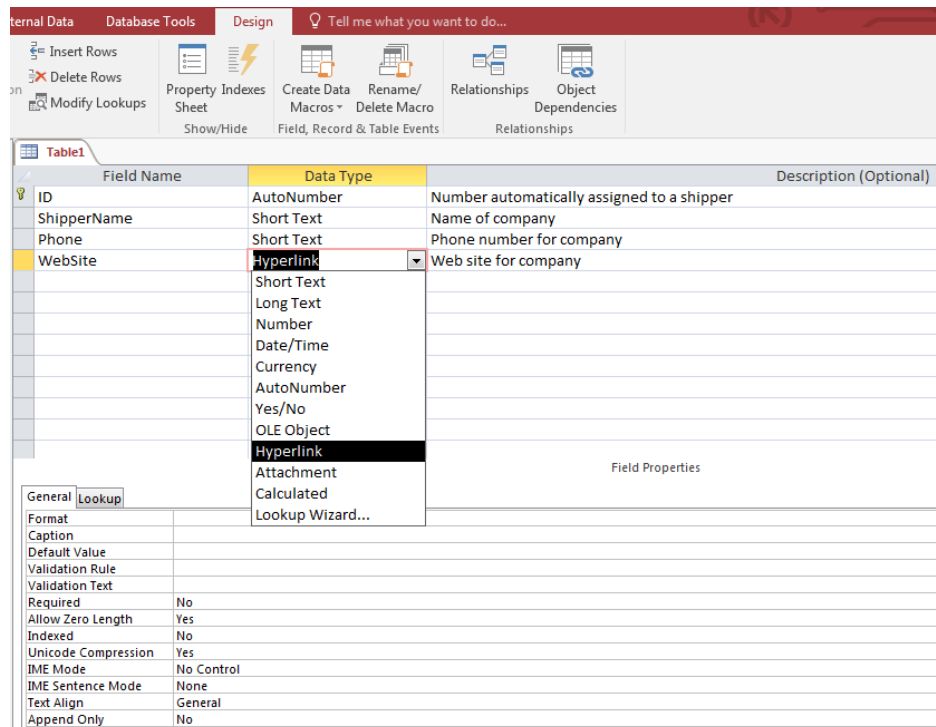
Creating a Hyperlink

A hyperlink is a special type of object that, when clicked, will direct you to some other file, object, or resource. For example, consider a database with a Shippers table containing the name and phone number of shipping companies that distribute your products:

Shippers			
ID	Shipper Name	Phone	Add New Field
1	Speedy Express	(123) 456-7890	
2	United Package	(456) 789-0123	
3	Federal Shipping	(789) 123-4567	
*	#####		

Let's insert another field into this table, a hyperlink to each shipper's Web site on the Internet. First, open the table in Design view. Enter Web site as the next available field name, and choose Hyperlink from the Data Type combo box.

We will also add a description of what this field is for:



Now that the data field is made, switch back to Datasheet view (Access will prompt you to save the table first) and enter the Web site of each shipping company:

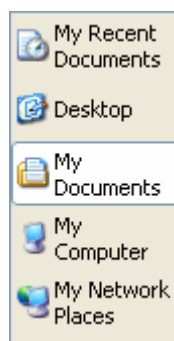
Shippers				
ID	Shipper Name	Phone	Web Site	Add New Field
1	Speedy Express	(123) 456-7890	www.speedyexpress.com	
2	United Package	(456) 789-0123	www.unitedpackage.com	
3	Federal Shipping	(789) 123-4567	www.federalshipping.com	
* #####				

To visit the Web site specified by the hyperlink, just click on the link while in Datasheet view or when the link is visible in a form or report. Your default Internet browser will launch and take you to the Web site.

Unit 1: Review Questions

1. **The Create New Folder icon in the My Computer dialogue box...**
- A. Makes a new folder in the folder you are currently viewing
 - B. Makes a new folder in the D: folder
 - C. Makes a new folder in the child folder
 - D. Makes a new folder in the C:/WINDOWS root folder

2. **What is the proper name for this toolbar?**



- A. Your Places Toolbar
 - B. My Places Toolbar
 - C. My Computer Toolbar
 - D. None of the above
3. **To increase the performance of a database by eliminating wasted disk space, you should _____ your database every once in a while...**
- A. Transform
 - B. Split and Compact
 - C. Compress and Repair
 - D. Compact and Repair
4. **Tables, when using the "Save As" function, can be saved as...**
- A. Another table, query, form, or report
 - B. Query, form, or report
 - C. Form or report
 - D. Report only
5. **RTF stands for...**
- A. Rich Text Family
 - B. Rich Text Format
 - C. Rich Text Form

- D. Rich Text Fonts

Rich Text Format is the proper name.

6. When linking to another database, which statement is false?

- A. Linked databases must be in the same child folder
- B. Linked databases can be anywhere on your computer or even on another network
- C. You can link tables, queries, reports, and macros
- D. Linked objects are denoted by a small arrow beside the object icon

7. The Map Network Drive command allows you to...

- A. List all files on your computer
- B. List all files on your network
- C. Access another folder on your computer
- D. Access another folder on another data location

8. Which command or group of commands is found in the Save As menu?

- A. Publish to Web Server
- B. Export to PDF or XPS
- C. Save the file as Access , 2002-2003, or 2000 file formats
- D. All of the above

9. Which file format can Access not use to create or export a file?

- A. XPS
- B. XML
- C. XDB
- D. PDF

10. When exporting or importing a file, which statement is false?

- A. The source file must be open
- B. The source file can be anywhere on your computer
- C. Even if you don't have Microsoft Word on your computer, you can still export a file as RTF
- D. You can save the export or import operation to use multiple times

UNIT 2: Working with Tables

In this section you will learn how to:

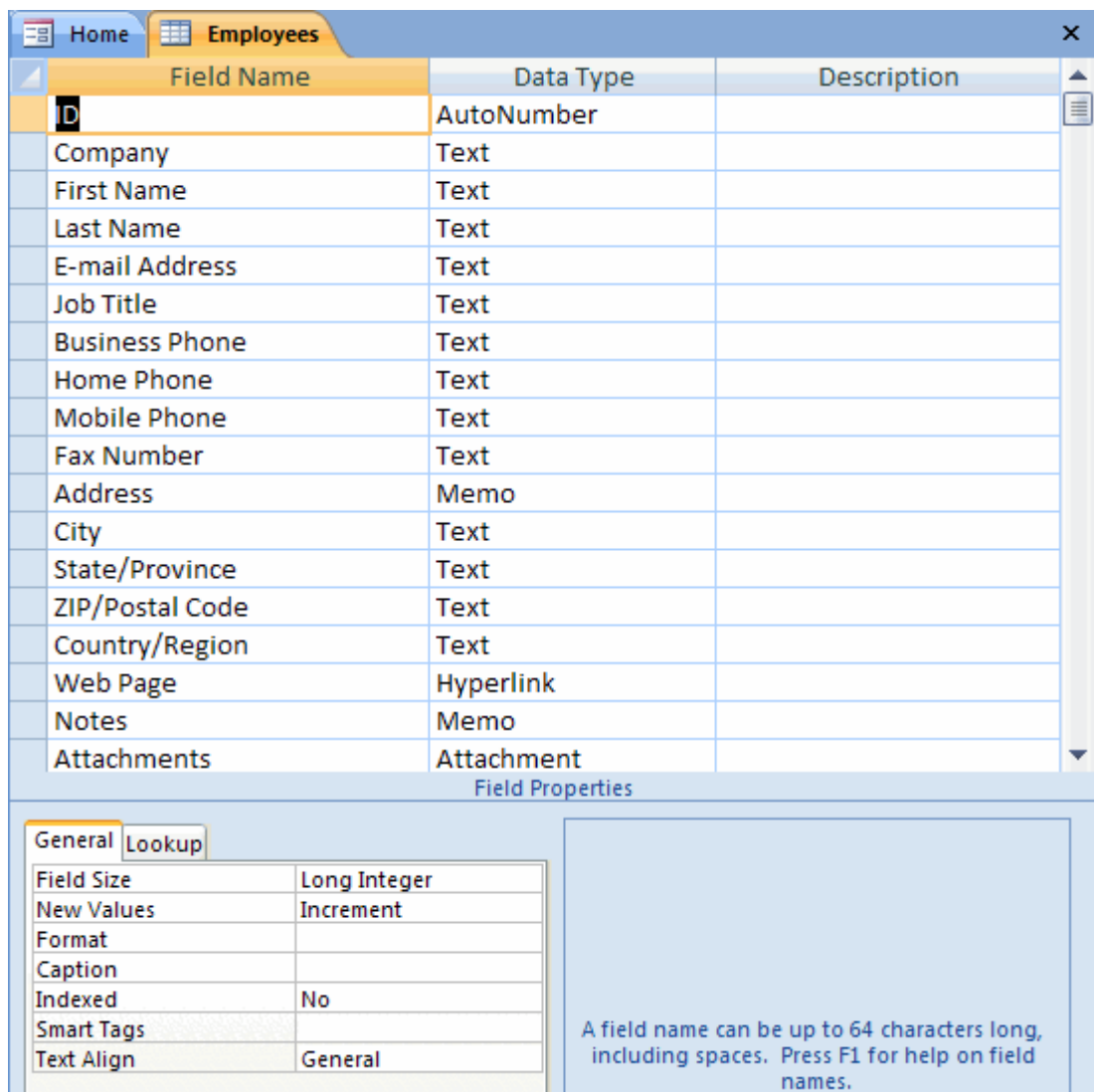
- Modify the properties of a table
- Create a primary key
- Format how data is entered and displayed in a table using default and required values
- Create a list of values based on data in another table
- Create a list of values you specify
- Create, remove, and edit table relationships

2.1: Customizing Tables

You should now be familiar with the basics of tables and understand fields and rows. In this lesson, we will explore tables in more depth and learn about their attributes and how they can be modified.

Understanding Field Properties

Every field in every table in every database has properties. In fact, you will learn that nearly everything in the entire Access program has properties of some type to modify! To see the field properties of a certain field, you must first open a table in Design view. Consider the Employees table from the Northwind sample database:



Field Name	Data Type	Description
ID	AutoNumber	
Company	Text	
First Name	Text	
Last Name	Text	
E-mail Address	Text	
Job Title	Text	
Business Phone	Text	
Home Phone	Text	
Mobile Phone	Text	
Fax Number	Text	
Address	Memo	
City	Text	
State/Province	Text	
ZIP/Postal Code	Text	
Country/Region	Text	
Web Page	Hyperlink	
Notes	Memo	
Attachments	Attachment	

Field Properties	
General	
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	No
Smart Tags	
Text Align	General

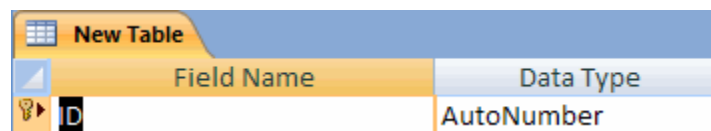
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Field properties are visible in the bottom half of Design view. Each field name has an associated data type. Each data type will have different properties that you can define to make the table contain exactly the data you need. We will explore Field Properties in depth later in this manual.

Adding a Primary Key to a Table

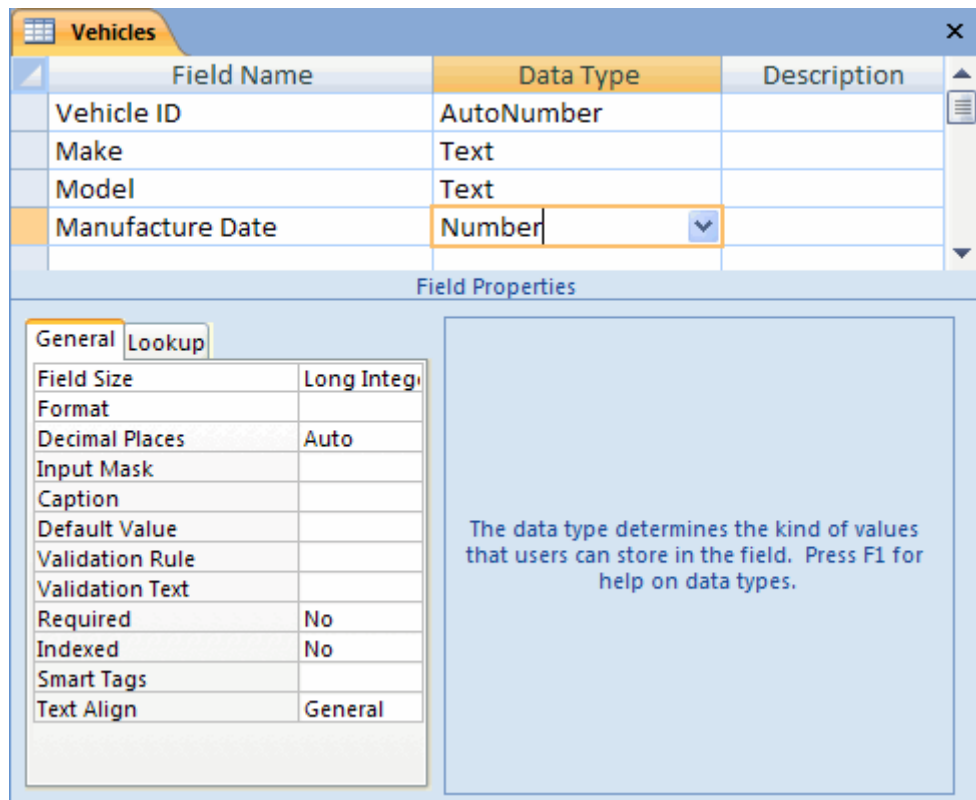
If you are just starting with Access, chances are you have been using the Table Wizard to help construct tables. One of the nice things about the Wizard is that it can automatically define a primary key for you. The Wizard is great for getting going, but once you become more comfortable with databases in general, you will likely build all of your tables using Design view.

In previous versions of Access, a primary key was not automatically defined when creating a table in Design view. You were prompted when you were ready to close and save the table. When constructing a table in Design view using Access , a generic primary key is already assigned:

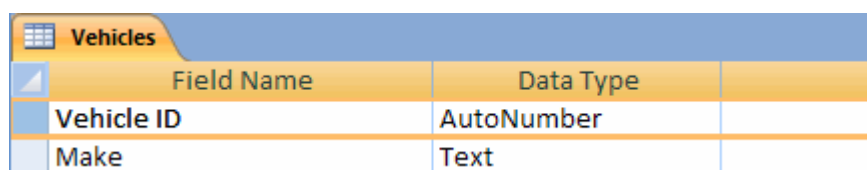


New Table	
Field Name	Data Type
ID	AutoNumber

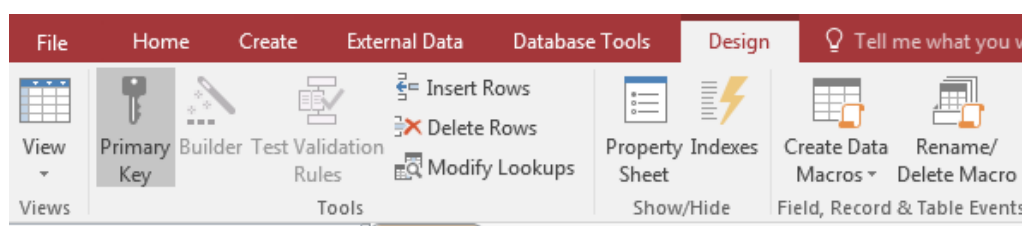
However, consider the following table which does not contain a primary key:



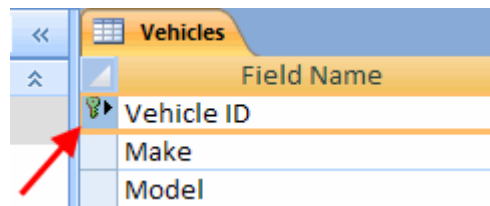
Currently this table does not have a primary key. If you recall, a primary key is used as some sort of unique identifier that separates every row in the table from every other. Vehicle ID is a good candidate for a primary key because every one of the IDs is different. To make it the primary key, click the light blue box beside the Vehicle ID cell to select the row:



Now click the Primary Key command in the Table Tools - Design ribbon:



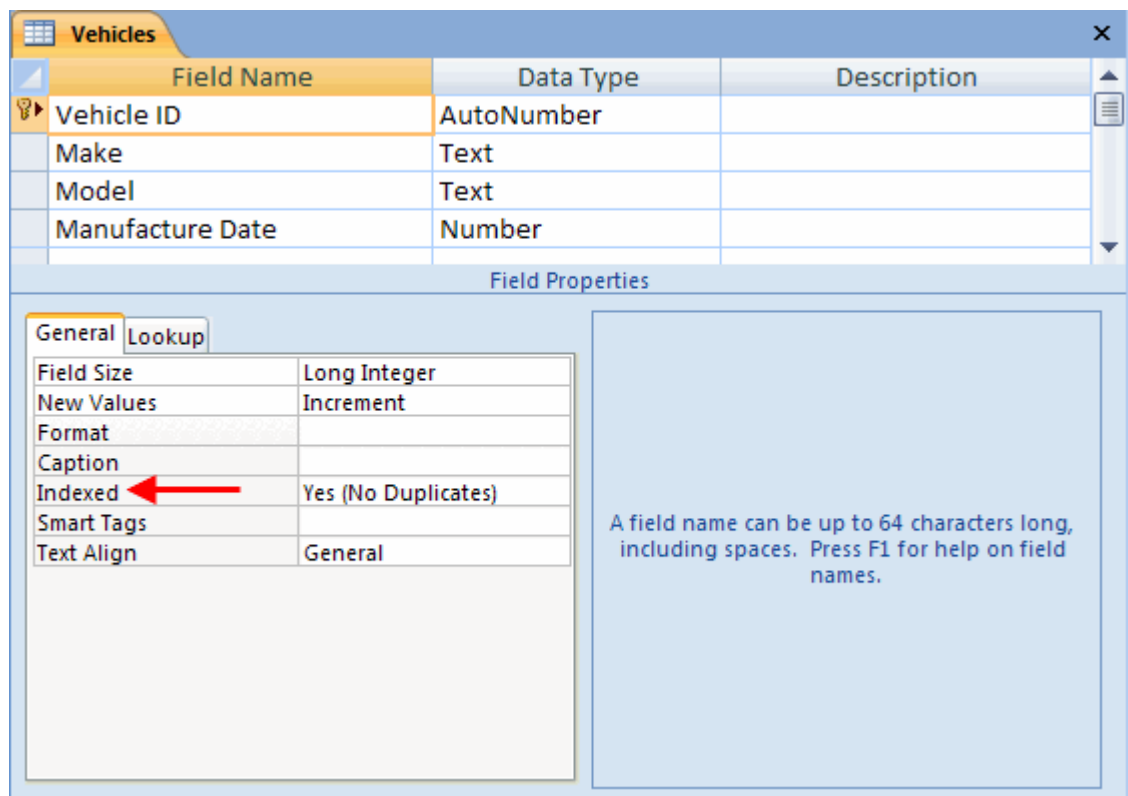
Primary keys in tables are denoted by a small key in the blue box beside the cell name:



Indexing a Field

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, first view the table in Design view:



The current field, which also happens to be the primary key, is indexed. 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. Vehicle ID would not use this feature because it is the primary key. But 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, but makes searches faster (in the case of very large databases).

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. This makes database updates faster but will decrease search time somewhat (in the case of very large databases).

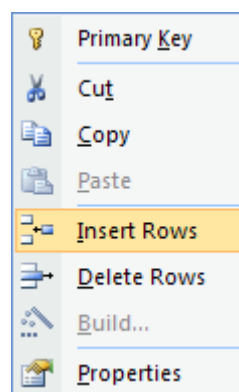
The only data types you can't index are Memos and Hyperlinks.

Inserting, Deleting, and Moving Fields

Let's continue with our vehicle database example. Access lets you easily insert new fields, delete useless/unused fields or fields that are not relevant to the data, and move the order of fields in a table. The easiest way to perform these tasks is by using the table Design view.

In this example, we will add two more rows to the vehicle table: Engine type and Color.

To insert a new field, either click in the empty cell beneath the last row in Design view and enter the data or insert a row between two existing rows. To demonstrate this, we will right-click the Manufacture Date field and click Insert Rows:



This will create a new row between Model and Manufacture Date:

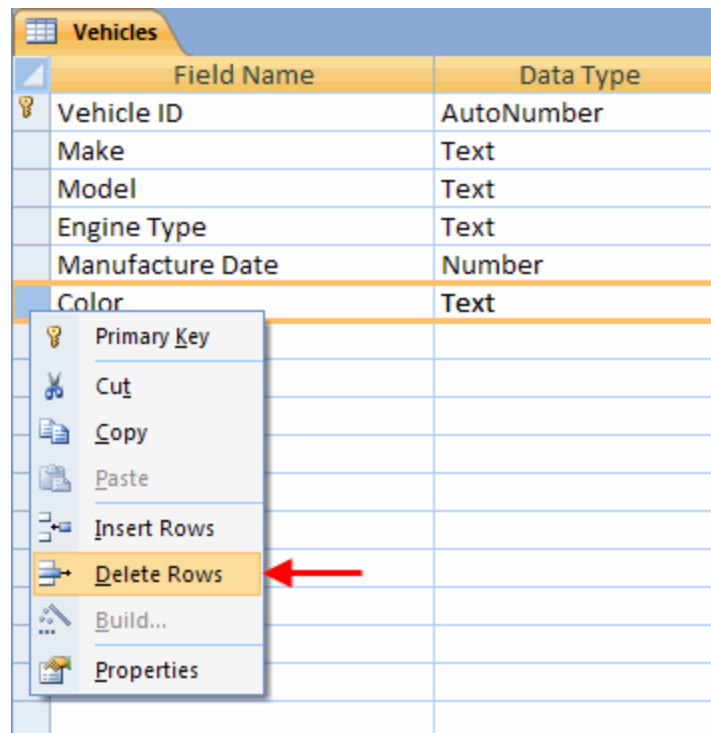
Vehicles	
Field Name	Data Type
Vehicle ID	AutoNumber
Make	Text
Model	Text
Manufacture Date	Number

Type Engine Type for the field name and Text as the Data Type.

o insert the Color field beneath Manufacture Date, simply click in the next empty cell in the Field Name column and type Color as the name; and Text as the data type:

Vehicles	
Field Name	Data Type
Vehicle ID	AutoNumber
Make	Text
Model	Text
Engine Type	Text
Manufacture Date	Number
Color	Text

In order to delete a row, first make sure that you remove any dependencies or relationships that may exist with other database objects. Access can help you with this task, but to be on the safe side, you should first make a backup copy of the database or the table by using the Save As command. Once you're ready, simply right-click on the blue box beside the field name and click Delete Rows:



To move a field, click the blue box beside the field you want to move to highlight the row. Click the field again, hold the left mouse button, and then drag the field up or down through the rows of Design view.

You will see a bold black line between the various fields as you move:

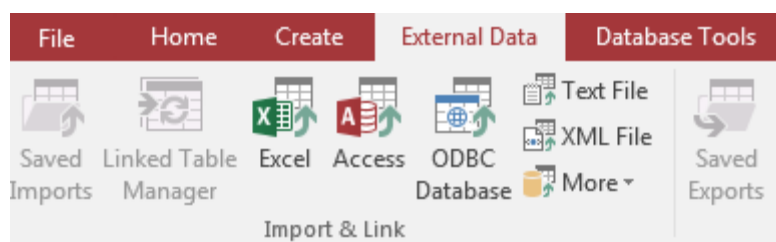
Vehicles	
Field Name	Data Type
Vehicle ID	AutoNumber
Make	Text
Model	Text
Engine Type	Text
Manufacture Date	Number

When the black line is in the location you want to move the row, release the mouse button.

Importing a Table from another Source

We have already covered how Access can import and export data from an external source in the previous section. Access features import and linking operations together in the same command group located in the External Data ribbon. In this lesson we will explore how to import an entire table from an external source.

In this example, we will import the contents of a table from the Northwind sample database. Open the destination database and click the Access command in the External Data ribbon:



The Get External Data – Access Database dialogue box will appear. Click the Browse button to locate the file and make sure the “Import tables, queries, forms...” radio button is selected:

Specify the source of the data.

File name:

Specify how and where you want to store the data in the current database.

☒ **Import tables, queries, forms, reports, macros, and modules into the current database.**
 If the specified object does not exist, Access will create it. If the specified object already exists, Access will append a number to the name of the imported object. Changes made to source objects (including data in tables) will not be reflected in the current database.

☐ **Link to the data source by creating a linked table.**
 Access will create a table that will maintain a link to the source data. Changes made to the data in Access will be reflected in the source and vice versa. NOTE: If the source database requires a password, the password will be stored with the linked table.

The Import Objects dialogue box will appear. Click each object you want to import one at a time from the Tables tabs at the top (or click Select All to highlight all under a single tab). For more advanced options and to change how Access will import objects, click the Options button:

Click OK and all of the selected table will be imported into your database. Access prompts you to save the import operation if you like. The table will be displayed in the Tables object page of the Database window. Since you have imported the data (as opposed to linking it) you have full access to do whatever you like to the data. The source file will not be touched.

2.2: Formatting Tables

We have entered all kinds of information into a table in Access, but so far we have only typed in raw data. In this lesson we will learn how to make tables in Access easier to use and more robust.

Formatting Number Fields

There are three types of number fields in Access: AutoNumber, Number, and Currency. To apply this new format, first open a table in Design view to adjust its field properties.

AutoNumber

General	
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	Yes (No Duplicates)
Smart Tags	
Text Align	General

The AutoNumber data type is used by Access to automatically count up by one or assign a random number each time a new record is added to a table. AutoNumbers are usually used as primary keys to ensure uniqueness in data. If values 1, 2, and 3 were used as an AutoNumber type, and you delete record 2, the number 2 is not reused as an AutoNumber.

Number

General		Lookup
Field Size	Long Integer	
Format		
Decimal Places	Auto	
Input Mask		
Caption		
Default Value		
Validation Rule		
Validation Text		
Required	No	
Indexed	Yes (No Duplicates)	
Smart Tags		
Text Align	General	

The Number data type is a more general number that can be used and formatted in many ways. Field Size indicates what data type the number itself will be: either Integer for whole numbers, or Double for decimal values or very large positive/negative values and/or decimal values. You can also assign an input mask, a default value, and validation rules to a number (we will cover these topics later).

The only limitation on a number field is that the values inputted can only be numbers! If you try to enter any letters of the alphabet, Access will warn you that you are attempting to enter an invalid data type into the field.

Currency

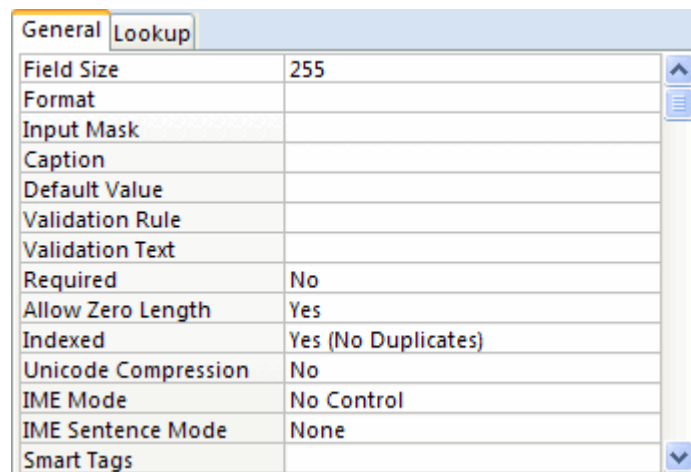
General		Lookup
Format		
Decimal Places	Auto	
Input Mask		
Caption		
Default Value		
Validation Rule		
Validation Text		
Required	No	
Indexed	Yes (No Duplicates)	
Smart Tags		
Text Align	General	

The Currency data type is very similar to the Number data type; the only difference is that a currency is permanently defined as a Double data type.

Formatting Text Fields

There are two types of text fields in Access: Text and Memo. Open a table in Design view to adjust its field properties.

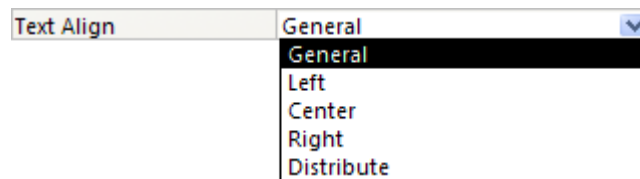
Text



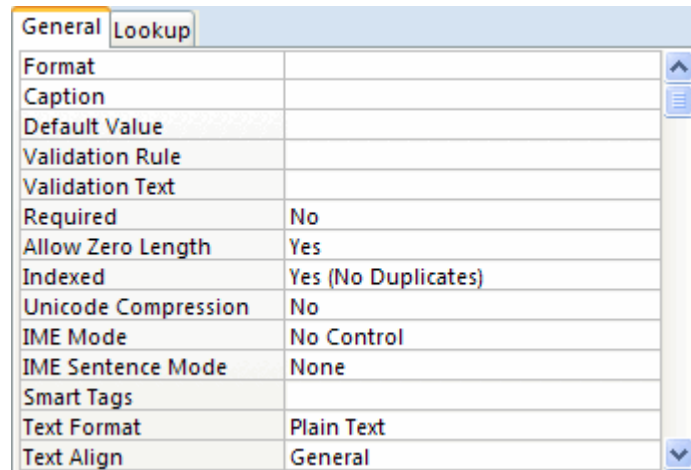
General	
Field Size	255
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

The Text data type is probably the most overall used data type in a database. Its properties are similar in nature to the Number data type, meaning it can have an input mask, validation rules, and a default value. The IME Sentence Mode, IME Mode, and Unicode Compression all deal with translation properties when converting a database in one language to another, like from Japanese to English. (These features are beyond the scope of this manual.) Text fields can contain essentially every letter, character, and number. Text fields can also be set for a certain number of characters; 255 characters is the maximum size. Text fields in Access feature

a new property, the ability to align text inside a field. This field is found at the very bottom of the list:



Memo



The Memo data type is very similar to the Text data type. The only real differences between the two are that a memo field can be much larger, up to 65,636 characters (roughly 35 pages of solid text!) Memo fields in Access also let you only append data to a memo field. That is, when you attempt to add data to a memo field, it will only be added to the end. You cannot overwrite any previous memo information.

Adding Field Descriptions

The Field Description fields are located on the right side of Table Design view. The fields are optional, though they are useful when several people are involved in constructing a database. You can leave a note explaining a field's function or why a certain field exists. Anything written here is also displayed in the Status Bar of a form (we will explore forms later in this manual):

Vehicles			
	Field Name	Data Type	Description
🔑	Vehicle ID	AutoNumber	Primary key of this table.
	Make	Text	Manufacturer of this vehicle.
	Model	Text	Model name/number of this vehicle.
	Manufacture Date	Number	First year of production.
	Engine Type	Text	Engine type of the vehicle.

You can type whatever you like in a field description, just as long as the description is less than 255 characters.

Changing Field Data Types

Access makes it very easy to change the data type of a certain field. Simply open the table containing the field you want to change and pick a new Data Type from the appropriate row. However, you must take care when modifying a data type in a table.

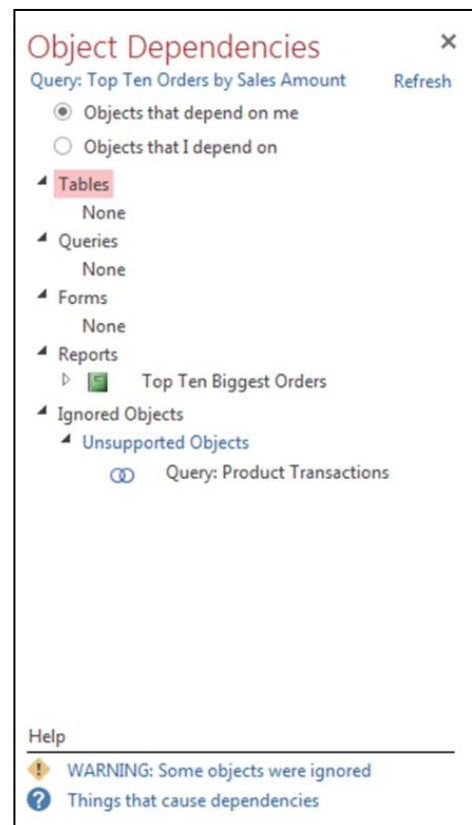
If the field is in a relationship with another table, or if the output of several forms and reports depend on the one field, changing the data type can be a major task. You should examine the dependencies of an object before making a change. Though we will explore table relationships more in this manual, relationships are one of the main characteristics of a database.

Picture a particular product listing in the Product table of a department store database. The item will contain a department number. The store database will contain another table called Departments. Let's say Department 1 is Women's Wear and Department 2 is Kitchen and Bath. Therefore, the two tables (Product and Department) are related because of common and related information (Department Number).

To examine object dependencies, open a database object from the Navigation pane. Then, click the Object Dependencies button in the Database Tools ribbon to see this pane:

Objects that depend on a particular object and all objects that a particular object depends on are visible by selecting one of the two radio buttons at the top of the Object Dependencies pane.

Some tables may have many dependent objects. Modification of this table could end up being a long and tedious task. It might even be faster in some instances to scrap the particular table altogether and design a new one with the modified data type. If you feel you have to modify a data type, be careful and make sure it is absolutely necessary to do so. Remember that you can always make a backup copy of the data base and/or a copy of the object itself before you make any big changes, just to be safe.



Adding Captions

The Caption field property is available to every data type available to Access. You can specify a caption to be a customized label for a field when the field is used in a form or report. You can name a caption whatever you like, or leave the field name as the default caption name.

General Lookup	
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	Yes (No Duplicates)
Smart Tags	
Text Align	General

2.3: Controlling Table Data Entry

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:

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

Field Properties	
General	Lookup
Field Size	Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	Cylinders
Default Value	6
Validation Rule	
Validation Text	
Required	No
Indexed	No
Smart Tags	
Text Align	General

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:

Vehicles

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

Field Properties

General Lookup

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:

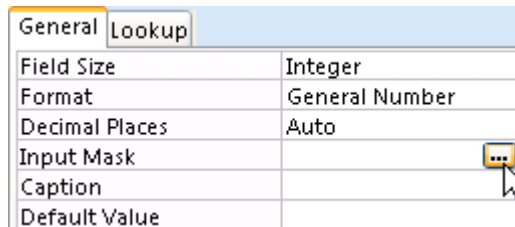
Business Phone ▾
(123)456-7890
(123)456-7890
(123)456-7890
(123)456-7890

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

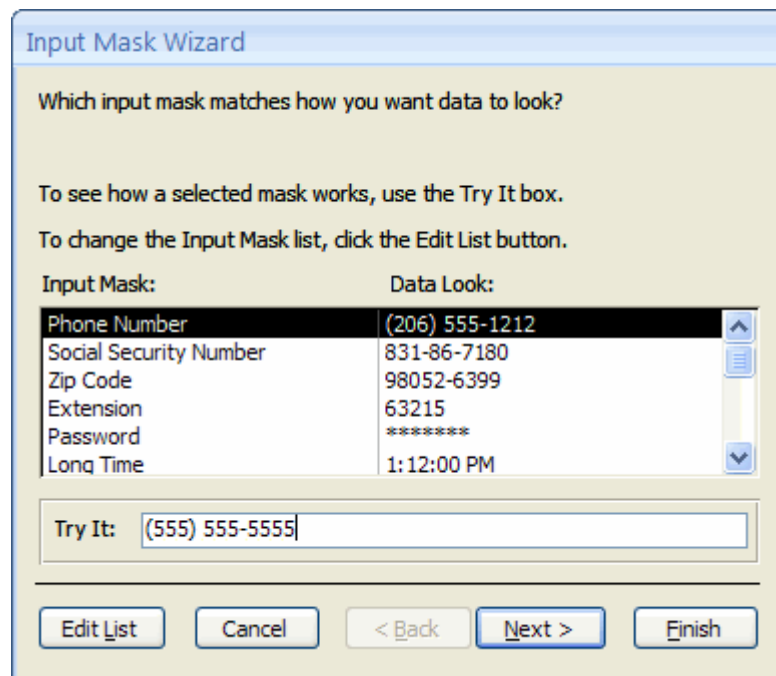
Employees	
Field Name	Data Type
ID	AutoNumber
Company	Text
First Name	Text
Last Name	Text
E-mail Address	Text
Job Title	Text
Business Phone	Text
Home Phone	Text
Mobile Phone	Text

Field Properties	
General	
Field Size	25
Format	
Input Mask	...
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	No
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

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.

Input Mask Wizard

Do you want to change the input mask?

Input Mask Name: User Defined

Input Mask: !(999) 000-0000

What placeholder character do you want the field to display?

Placeholders are replaced as you enter data into the field.

Placeholder character: *

Try It: (***) ***-****

Cancel < Back Next > Finish

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

Input Mask Wizard

How do you want to store the data?

☐ With the symbols in the mask, like this:
(655) 337-0776

☒ Without the symbols in the mask, like this:
04873813

Cancel < Back Next > 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 Wizard. If you close the Employees table Design view, and then open the table in Datasheet view, you will see that the Phone field has the input mask applied to it:

[illegible]

Creating and Removing Table Relationships

In this section we will explore the staple that really makes a database work: the relationships that are established between the different tables of data. When designing a database, this is the most challenging step and often the place where most of the confusion with databases arises. Fortunately, databases are nothing more than tables of data that are related.

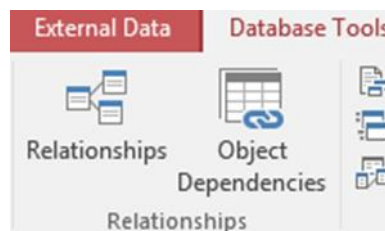
Consider the following simple database:

Expenses				Employees				
Employee ID	Date	Expense Type	Amount	Employee ID	Name	Address	Phone	Title
2	5/7/2006	Erasers	10	1	Bugs Rabbit	44 Carrot Dr	555-1212	CEO
2	5/25/2006	Lunch	50	2	Elmer Funn	123 Wabbit Way	555-9876	VP
1	6/1/2006	Flight	600					

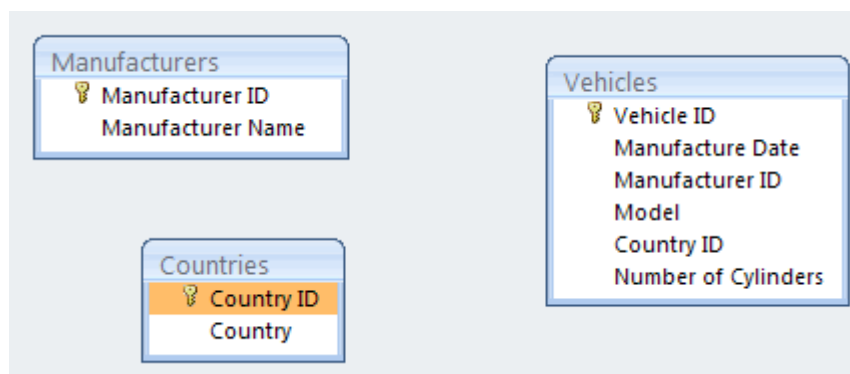
Imagine your database has a table of employees, and a table of expenses that have been made by your employees. As time goes by, the Expenses table will grow to become quite large. You wish to make a query that will find out the phone number of every employee that submitted an expense. It is impractical to place the employee phone number in the same table as the expenses. It will create a lot of extra data that is not really needed if there is another table containing employee data elsewhere. The

relationship between the two tables is created because of the two common fields, EmployeeID. In particular, the Employees table and the Expenses table are in a “one-to-many” relationship, meaning that one entry in the Employees table can relate to many entries in the Expenses table.

Knowing this, we can add two relationships to our expanded Vehicles Database. You can view the relationships by clicking the Relationships command in the Database Tools ribbon:



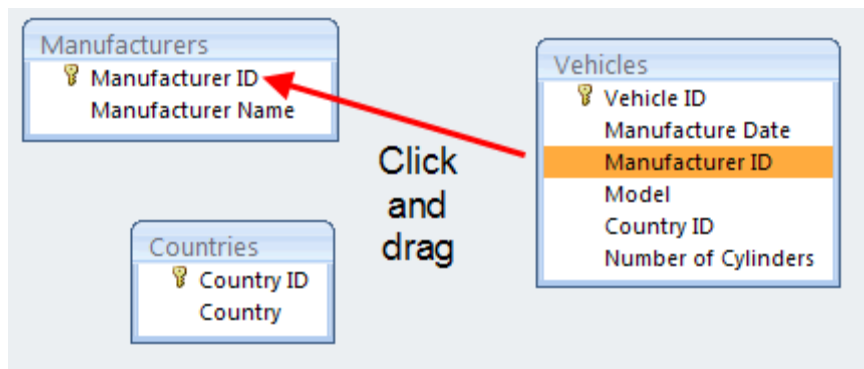
Consider the following tables:



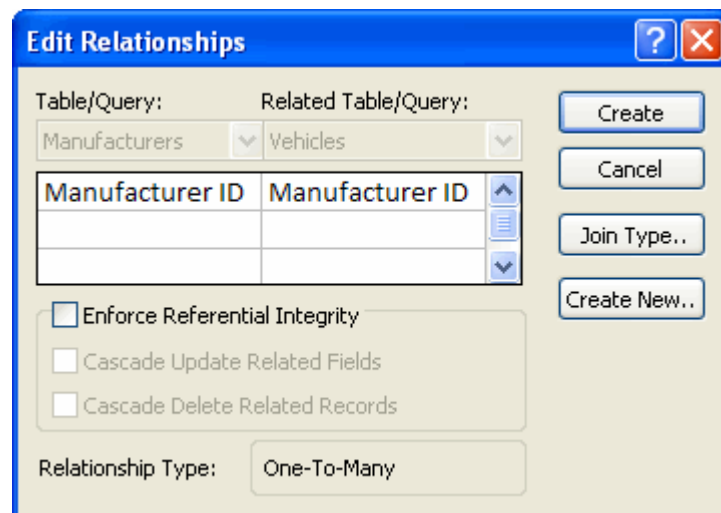
Instead of naming every country and manufacturer in the Vehicles table, we can lighten the size of the Vehicles table by taking those two pieces of information and storing them in a separate location. In a database of this size this may not seem like that big of a deal, but as we proceed through this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

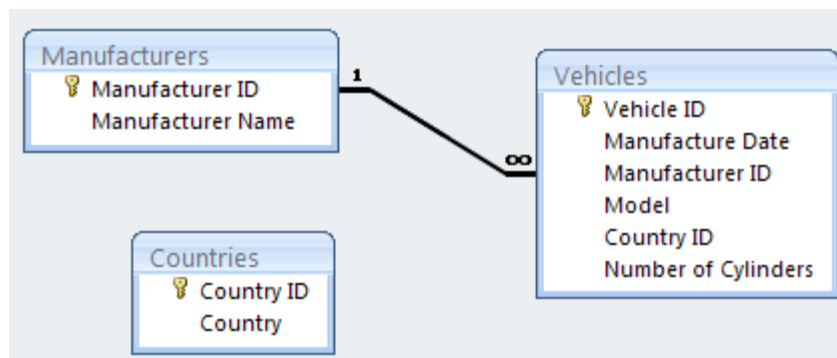


Access has determined that the style of this relationship is One-To-Many, based on the data that was collected from the drag and drop operation. Before clicking the Create button, you should click the Enforce Referential Integrity check box.

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:

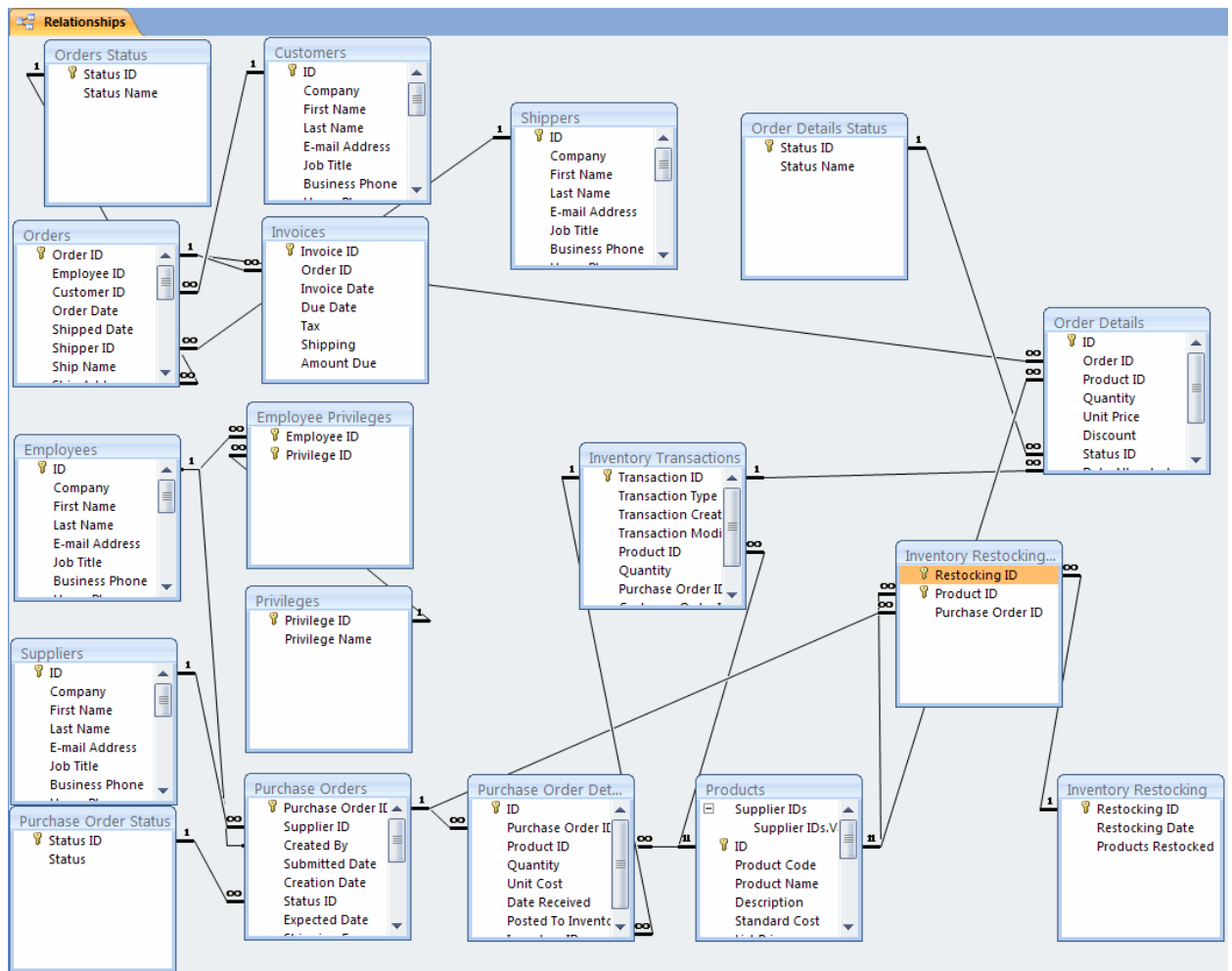
- The matching field from one table is a primary key or has a unique index. (True: Manufacturer ID is the primary key)
- The fields in the relationship have the same data type. (True: both fields are numerical)
- Both tables are stored in the same database. (True: both tables are in the same database file, not a linked table.)

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

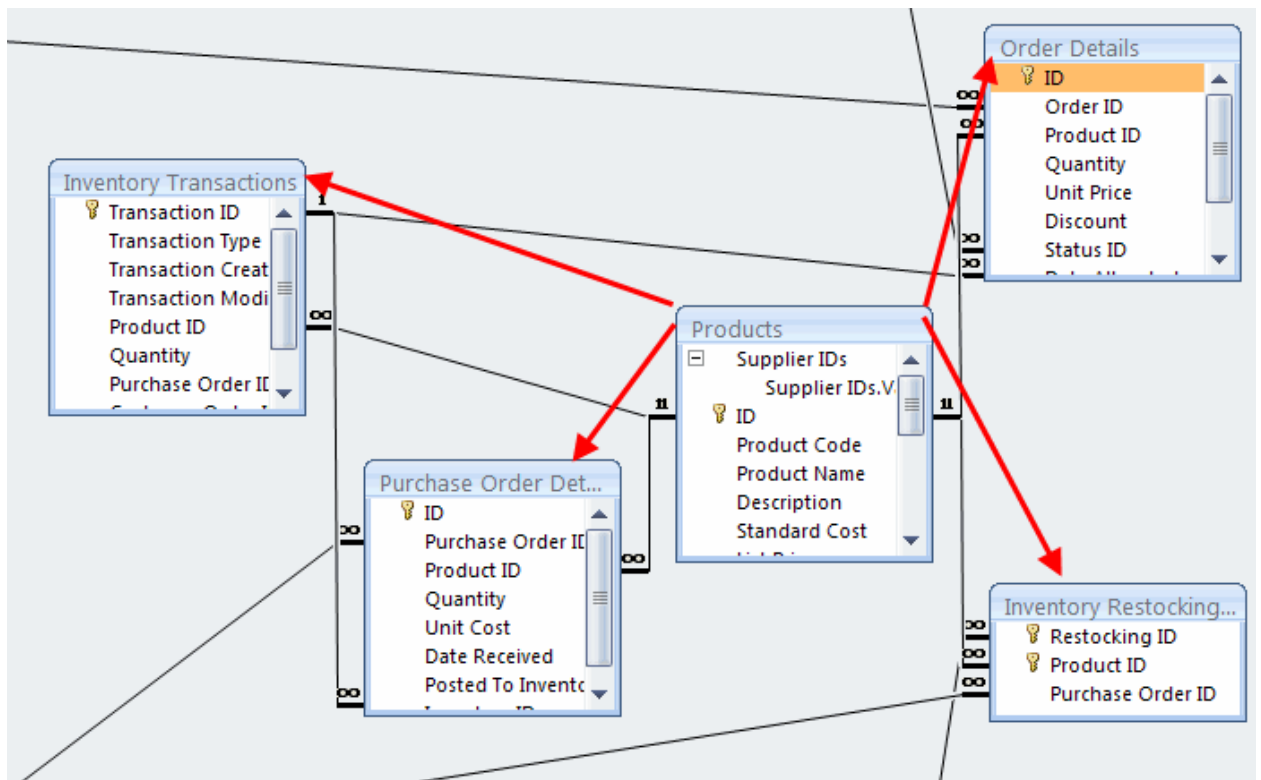


You can see the one-to-many relationship in the diagram above. One Manufacturer ID from Manufacturers may correspond to many Manufacturer IDs from Vehicles.

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!



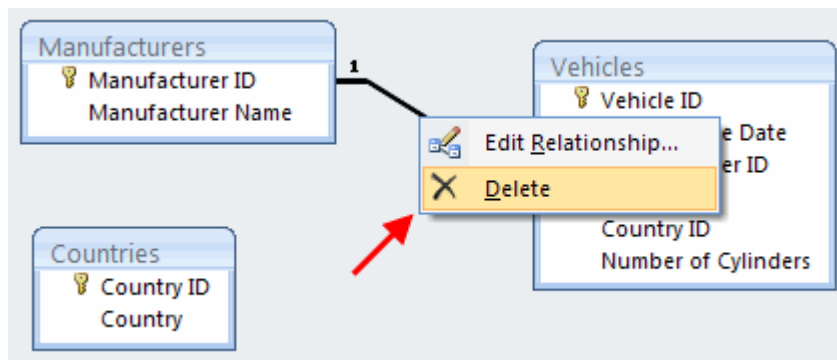
Let's examine the Products table in this database:



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:



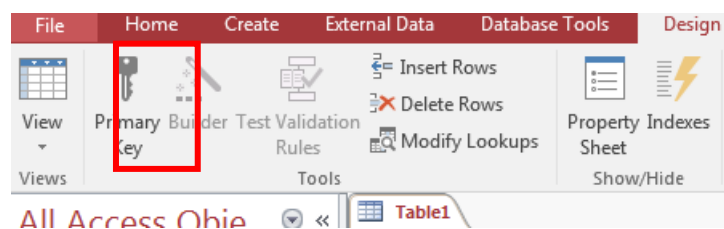
Access confirms that you want to delete the relationship, click Yes to confirm.

2.4: Managing Table Data Entry

In the final lesson of 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.

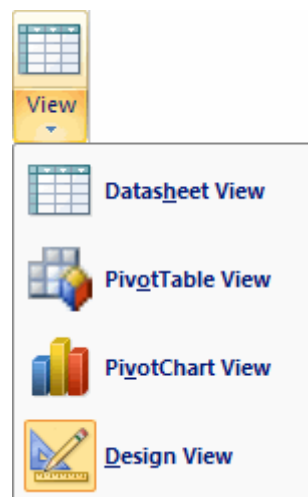
Using the Table Design Ribbon

Access 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.

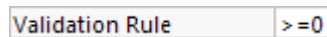
Builder	Use this command to activate the expression builder. The expression builder is used to create logical expressions used to help ensure data is properly entered into a table. We will explore the use of this command in this lesson.
Test Rules	Validation This command will check any logical expressions 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.

How to Validate Data

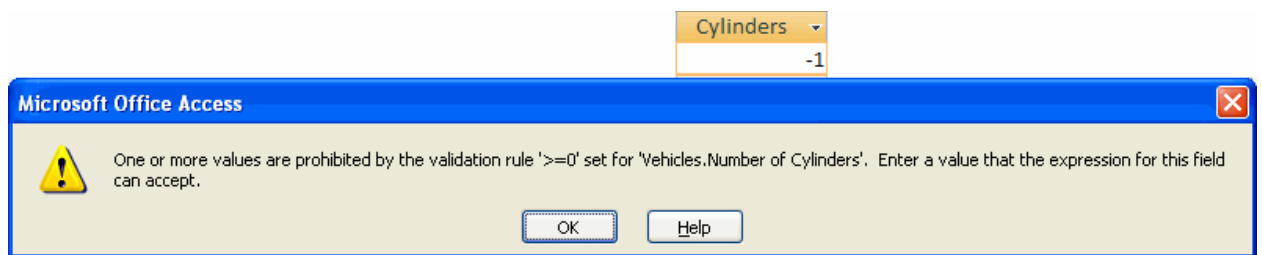
In addition to adding protection like required values and input masks, you can also add validation rules to your database to ensure that data entered makes sense.


For example, consider the Vehicles table used in the last Step-By-Step. The Number of Cylinders field has a default value of 6 and the Field Size is defined as Integer, which prevents decimal numbers from being entered. The field Description states that if a vehicle is equipped with a rotary engine (one that has no cylinders) that 0 should be the value. Therefore, a data entry is valid if it is a whole number greater than or equal to zero. However, no precautions are in place to prevent someone from entering a negative number of cylinders, a data entry that does not make sense.

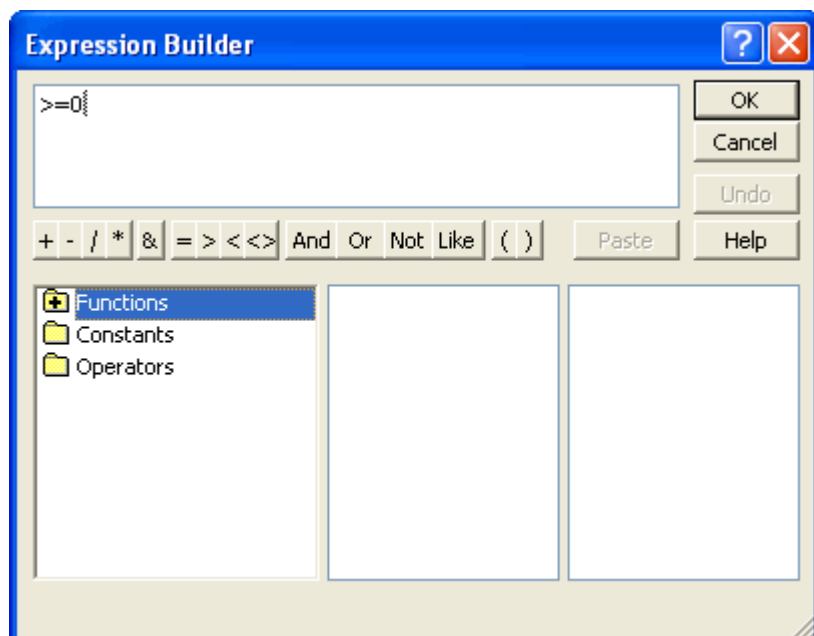
By clicking in the Validation Rule box, you can enter a simple expression, ≥ 0 .



This will prevent someone from entering a negative number of cylinders:



Back in Design view, you can click the  button beside the Validation Rule field to launch the Expression Builder:



The Expression Builder lets you create customized validation rules, expressions, logical functions, and much more. We will explore the basic functionality of the expression builder later in this manual.

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:

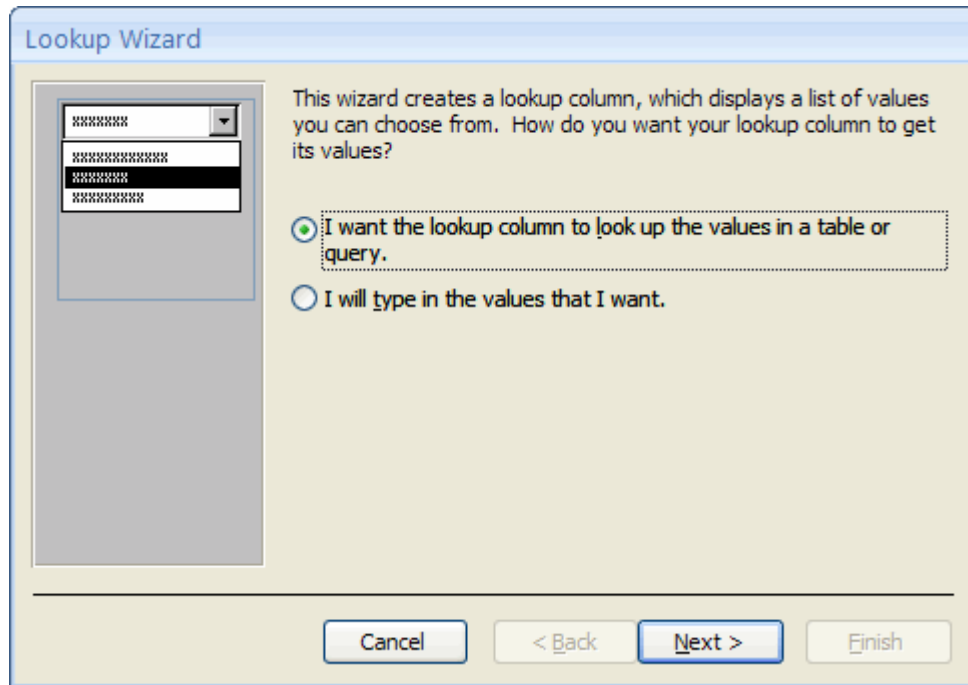
Vehicle ID #	Manufacture Date	Manufacturer ID	Model	Country ID	Cylinders
1	1982	1	Corvette	1	8
2	2003	2	V12 Vanquish	2	12
3	2000	3	S2000	4	4
4	2003	4	Tiburon	5	4
5	2002	5	575 Marinello	3	12
6	1979	6	Spider	3	4
7	1965	7	Falcon	1	8

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.

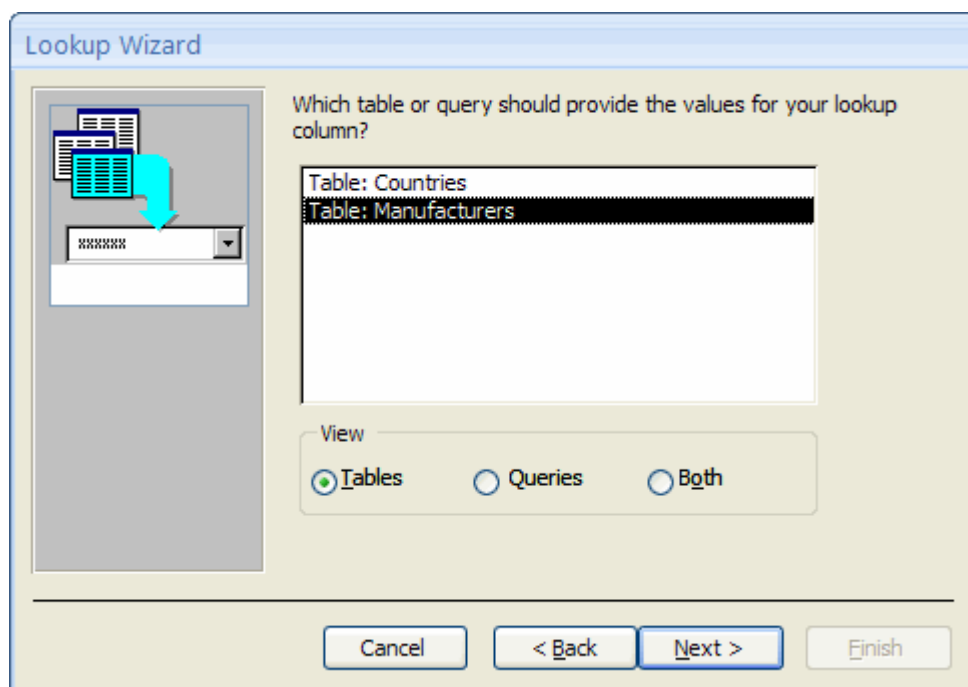
First, open the Vehicles table in Design view. Click in the Data Type cell of the field you want to turn into a lookup table and click Lookup Wizard.

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...	

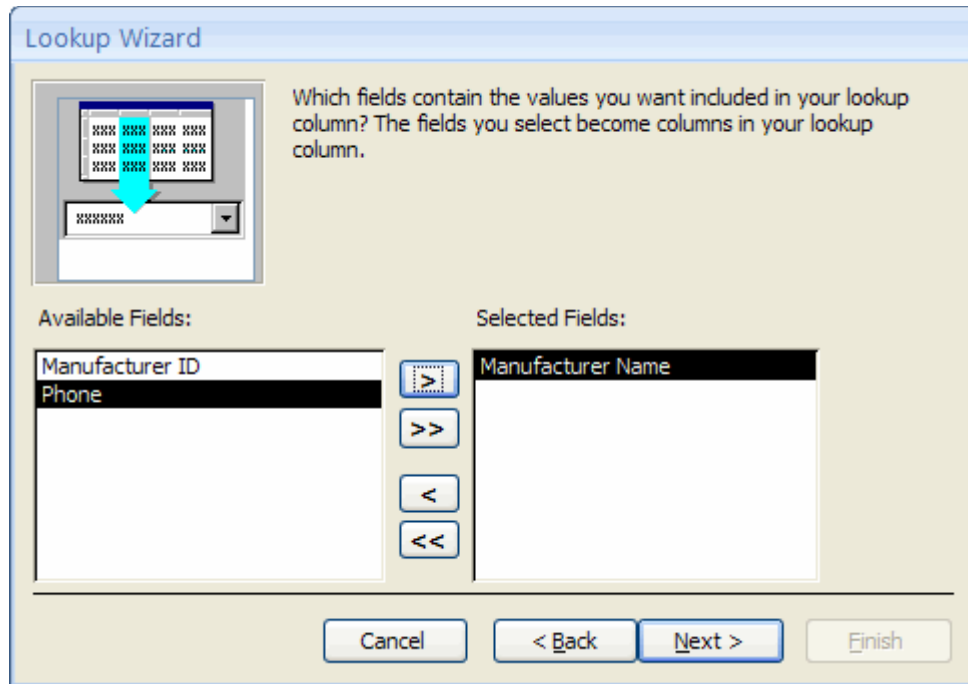
The Lookup Wizard will appear. In the first step, select the data source you will use for your lookup field. In our case, we want to use the data contained in the Manufacturers table:



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:

Lookup Wizard

What sort order do you want for the items in your list box?

You can sort records by up to four fields, in either ascending or descending order.

1

2

3

4

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				

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.

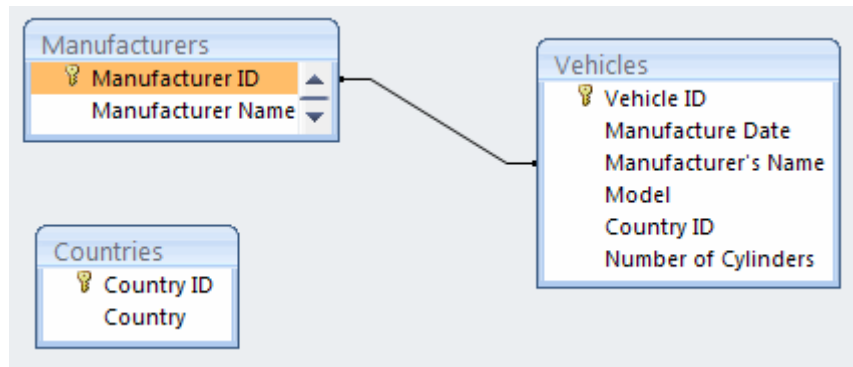
☐ Display Help on customizing the lookup column.

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:

Edit Relationships

Table/Query: Manufacturers Related Table/Query: Vehicles

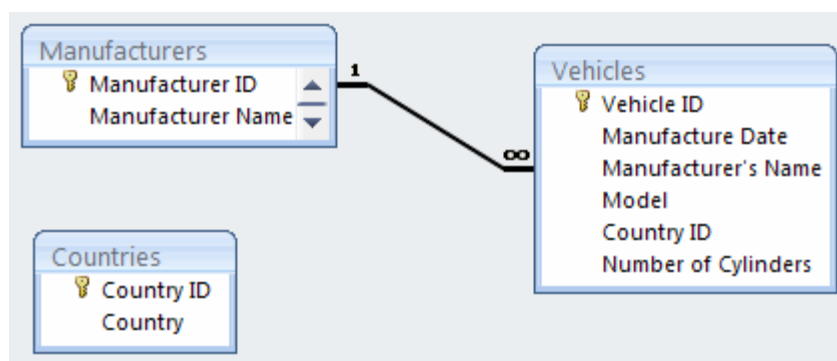
Manufacturer ID	Manufacturer's N

☒ Enforce Referential Integrity
☐ Cascade Update Related Fields
☐ Cascade Delete Related Records

Relationship Type: One-To-Many

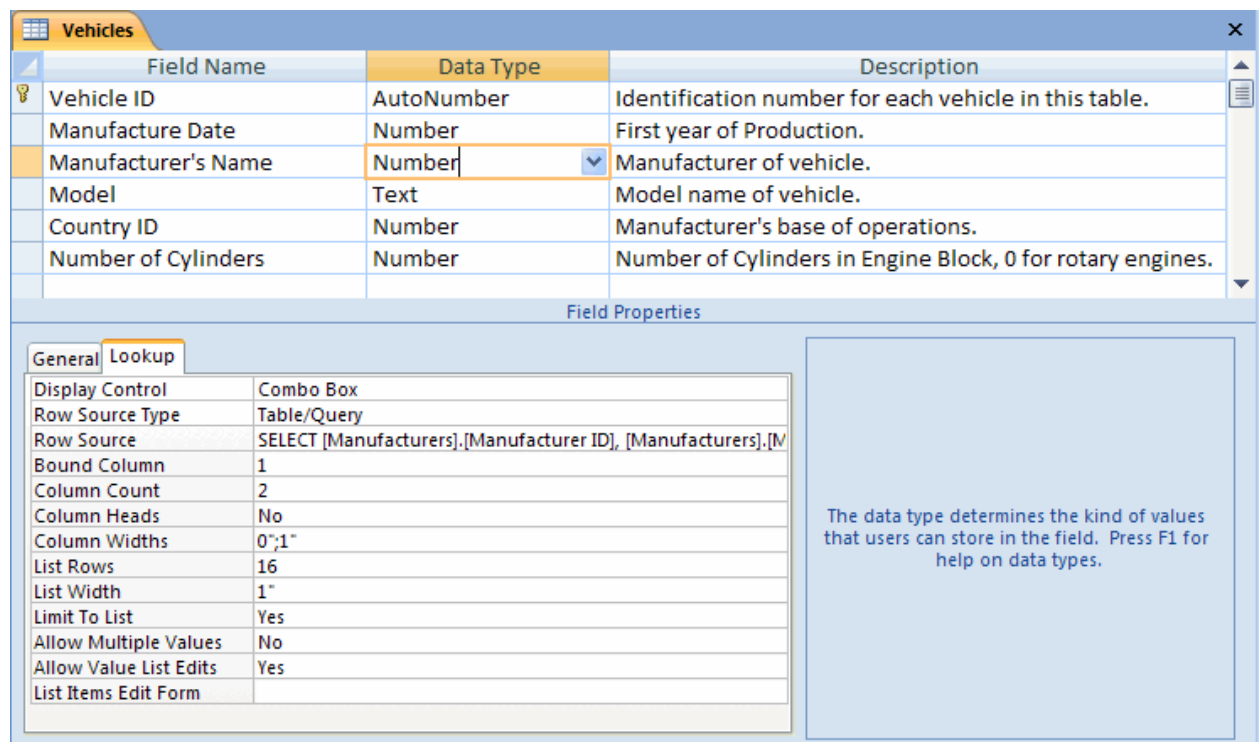
Buttons: OK, Cancel, Join Type.., Create New..

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:



Field Name	Data Type	Description
Vehicle ID	AutoNumber	Identification number for each vehicle in this table.
Manufacture Date	Number	First year of Production.
Manufacturer's Name	Number	Manufacturer of vehicle.
Model	Text	Model name of vehicle.
Country ID	Number	Manufacturer's base of operations.
Number of Cylinders	Number	Number of Cylinders in Engine Block, 0 for rotary engines.

Field Properties	
Lookup	
Display Control	Combo Box
Row Source Type	Table/Query
Row Source	SELECT [Manufacturers].[Manufacturer ID], [Manufacturers].[M...
Bound Column	1
Column Count	2
Column Heads	No
Column Widths	0";1"
List Rows	16
List Width	1"
Limit To List	Yes
Allow Multiple Values	No
Allow Value List Edits	Yes
List Items Edit Form	

The data type determines the kind of values that users can store in the field. Press F1 for help on data types.

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.

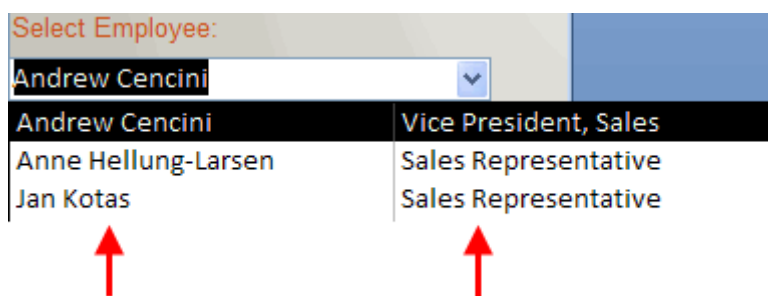
Row Source

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



Allow Edits	Value List	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.

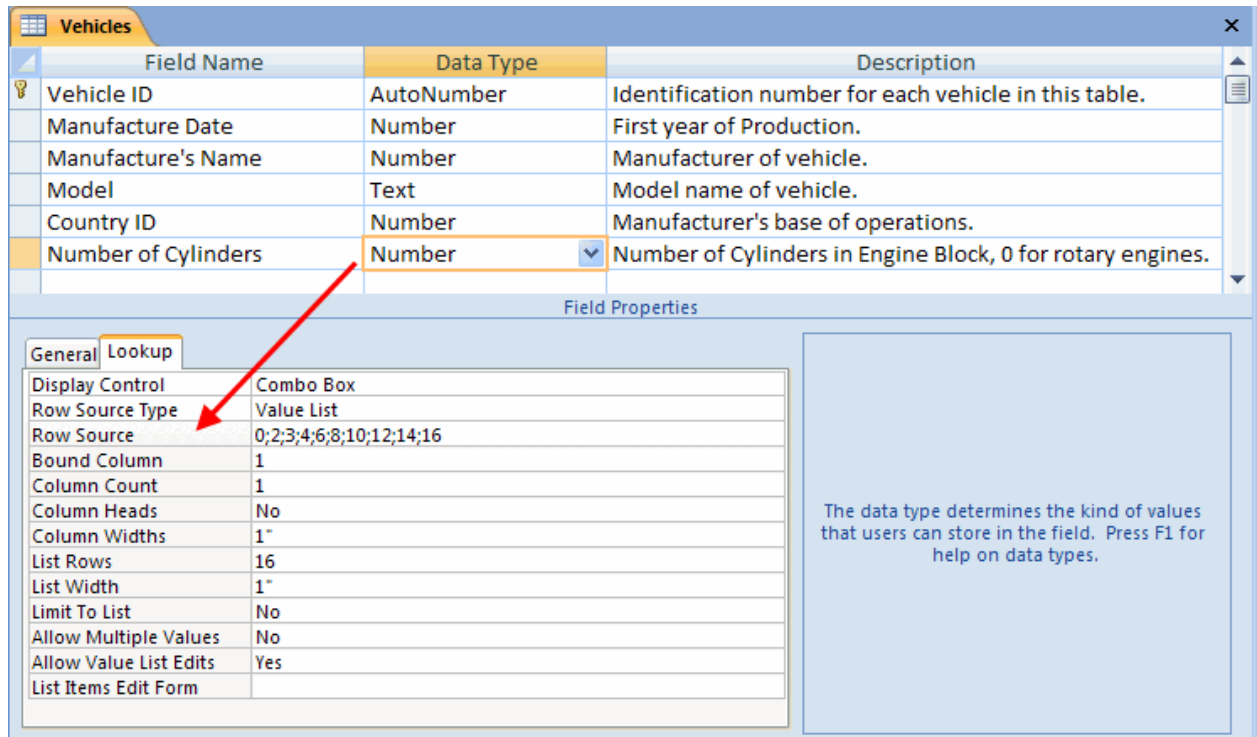
Cylinders ▼

8 ▼

0
2
3
4
6
8
10
12
14
16

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.

Unit 2: Review Questions

1. **Which method is correct to manually add a primary key to a table?**
 - A. Right-click the grey box beside the field you want to make the key and select Primary key from the right-click menu
 - B. Choose the Primary Key data type from the Data Type combo box for the field
 - C. Choose the AutoNumber data type from the Data Type combo box for the field
 - D. None of the above
2. **When indexing a field, which of the following options is not a valid Indexing setting?**
 - A. No
 - B. Yes (Duplicates OK)
 - C. Yes (No Duplicates)
 - D. Yes (Primary Key Excluded)
3. **Which of the following is a valid operation that can be performed on a field in Design view?**
 - A. Inserting a new field
 - B. Moving a field
 - C. Deleting a field
 - D. All of the above
4. **What is the maximum amount of characters that can be held in a memo field?**
 - A. 9
 - B. 255
 - C. 65,536
 - D. As many as you want, as long as there is enough hard drive space to hold the memo and the database together.
5. **Which of the following statements is true?**
 - A. Captions can only be used for text data types
 - B. Default values cannot be changed in Datasheet view
 - C. Default values can only be assigned to number data types
 - D. All these statements are false
6. **Which validation rule satisfies the statement "greater than or equal to negative 13"?**
 - A. $= > -13$

- B. ≥ -13
- C. > -13
- D. None of the above

7. Value lists allow you to make your own data; lookup fields can get their information from _____ and/or _____ (select all that apply).

- A. Tables
- B. Queries
- C. Forms
- D. Reports

8. Which statement concerning the AutoNumber data type is false?

- A. If you delete a row with an AutoNumber value, the deleted AutoNumber value is reused
- B. AutoNumbers are usually used as primary keys because they never repeat themselves
- C. AutoNumbers can only be positive numbers.
- D. If you delete a row with an AutoNumber value, the deleted AutoNumber value is never reused

9. Which statement about default values is true?

- A. Default values are always used in Primary Keys so the field is not null
- B. Must always be numerical
- C. Can contain letters or numbers
- D. None of the above

10. Which condition is true when dealing with referential integrity?

- A. The matching field from one table is a primary key or has a unique index
- B. The fields in the relationship have the same data type
- C. Both tables are stored in the same database
- D. All of the above

UNIT3: Working with Forms

In this section you will learn how to:

- Create a form based on a table
- Create a blank form
- Learn about the different controls available for use in a form
- Use different object modification commands
- Adjust the look and feel of a control
- Add a corporate logo or title picture to a form
- Use the QuickFormat option to format an entire form at once

3.1: Basic Form Controls

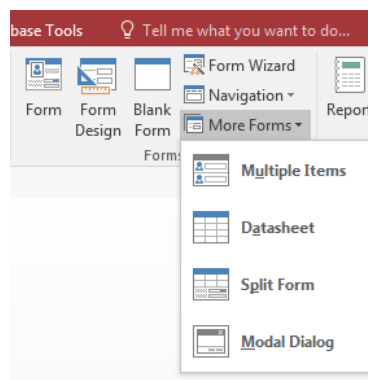
By now you should be very comfortable with creating and controlling data contained in the tables of your database. In the coming lessons, we will learn how to make the database more usable by using forms.

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.

Form Design

Create a new blank form in design view.

Blank Form

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

Form Wizard

Form Wizard walks you through the creation of a form. The end result is a complete working form that can be used right away.

Navigation


Creates a form that lets people navigate to different forms and reports.

More Forms

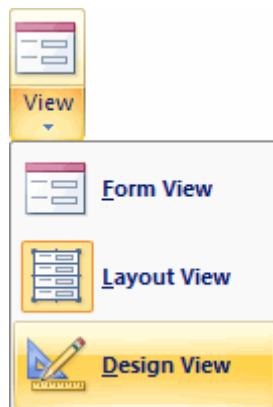
This command opens a small menu containing other commands relevant to the use of forms:

- Multiple Items 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.
- 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.
- 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.

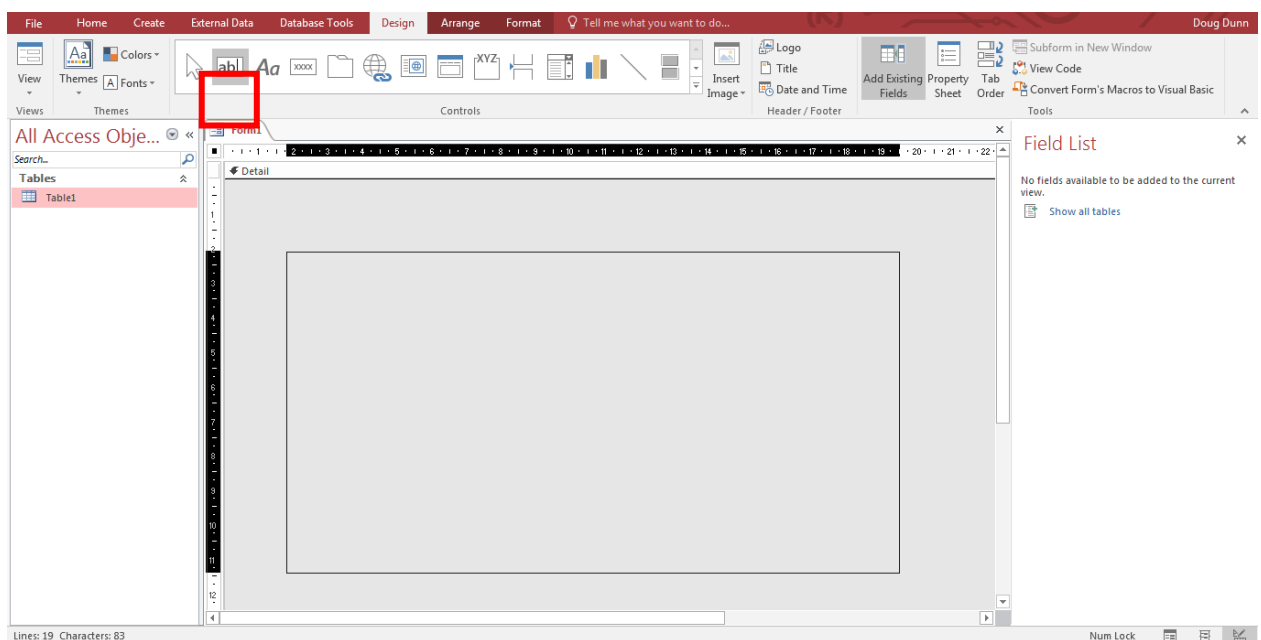
- Modal dialogue allows you to create a new form that looks just like a dialogue box. Modal Dialogue forms also feature OK and Cancel buttons built in.

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:

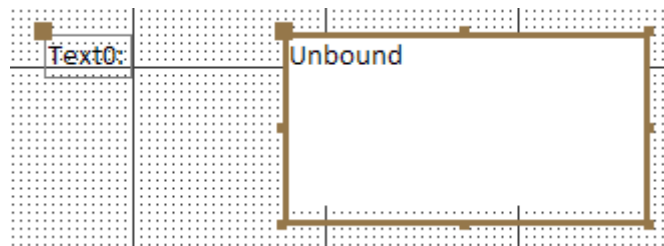


The majority of controls in Access can be added to a form in Access by clicking and dragging an area you want to designate for the control. For example, if you wanted to add a Text box to the empty form, click the text box command and then drag an area:



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:

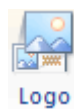


Access features a wide range of commands that can be used in a form.



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

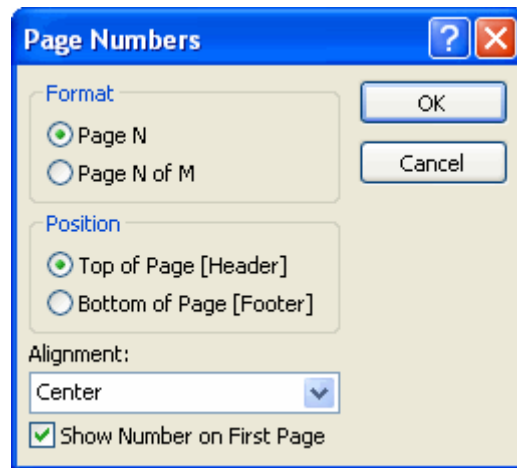


This command adds a title to the Form Header section.

Page Numbers



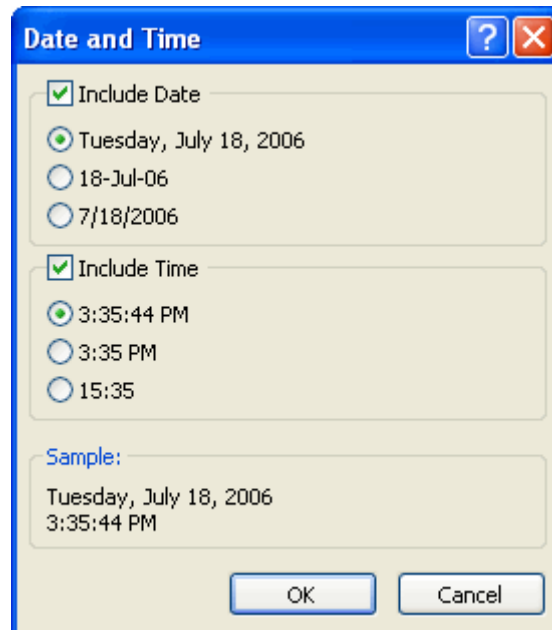
Click this command to show the Page Numbers dialogue box. Select the options and position you want to use for your form.



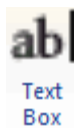
Date and Time



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.





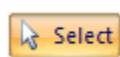


Combo Box



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.

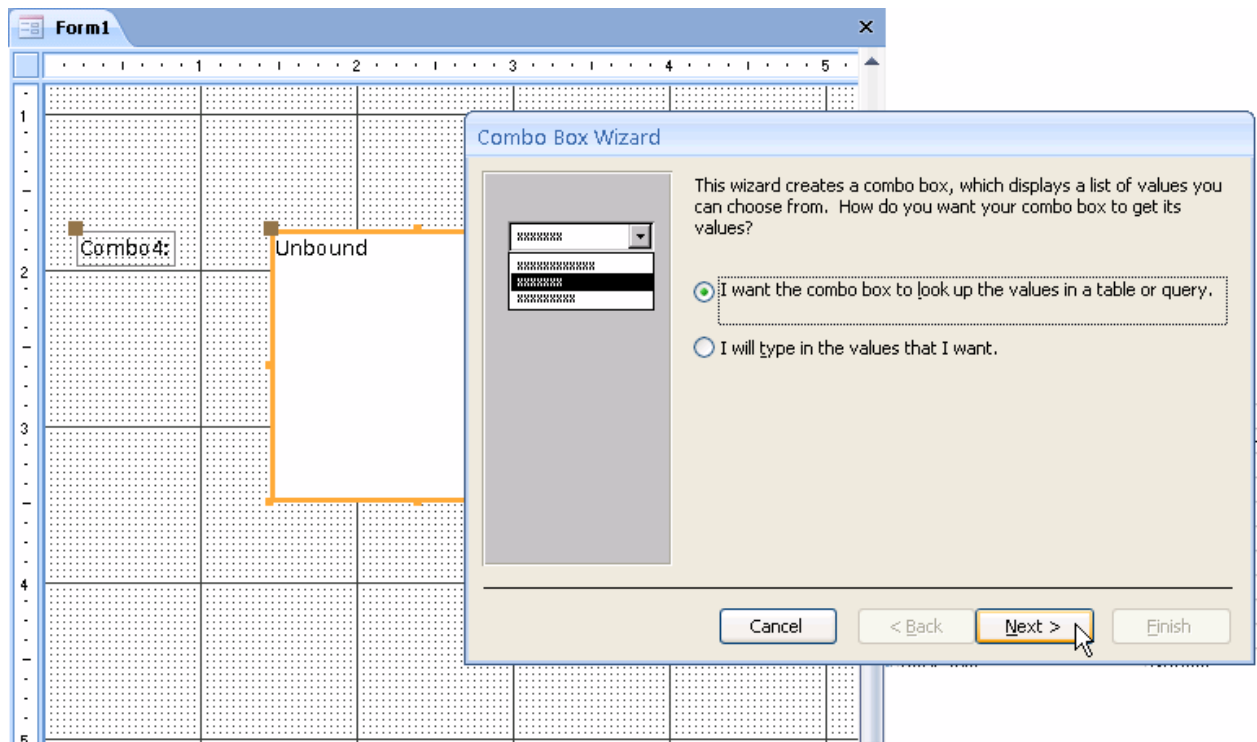
Tab Control		Lets you create a series of tabs in your form, each with its own options. Useful if you have a large numbers of controls in a frame that can be categorized.
Insert Page		Use this command to insert a page into a certain section of a form.
Insert Chart		Click and drag an area in the form to 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:

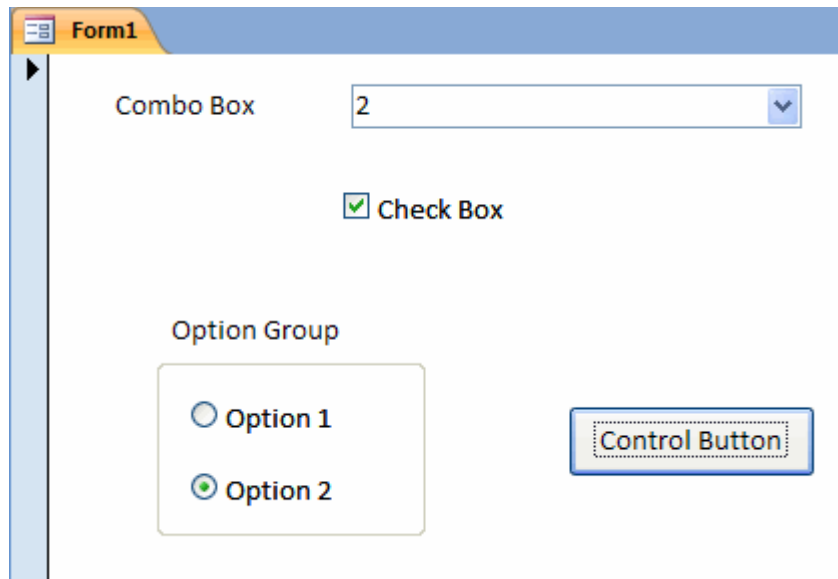


Follow the directions provided in the Wizard to format your control.

Cutting, Copying, Pasting, and Moving a Control

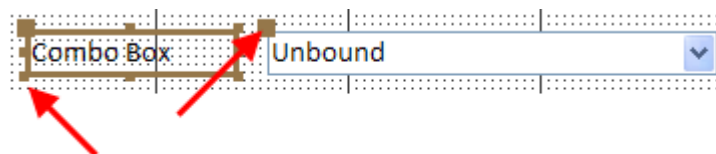
Thanks to the interactive and graphical control provided by most computer programs (including Microsoft Office) many objects can be cut, copied, pasted, and moved on your screen. When working with a form, Access lets you perform all of these options with your mouse.

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.

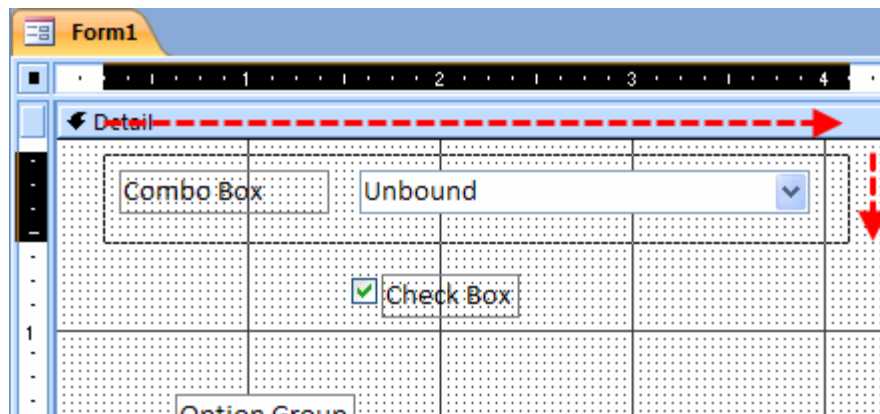
To perform these actions, open the form in Design view. When you click on a form, you will see the following handles appear:



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.

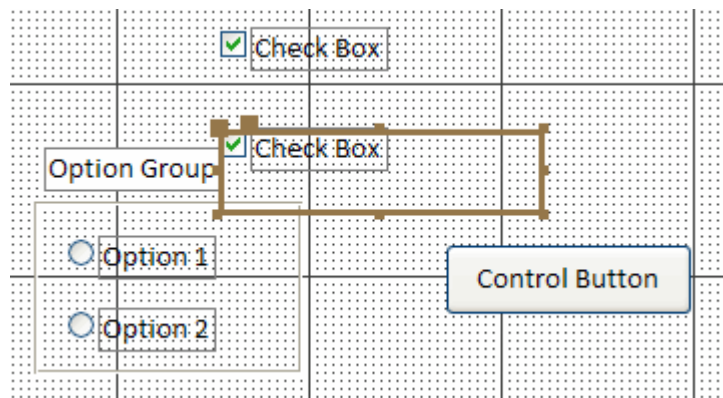
To cut the control when selected, press Ctrl + X on your keyboard. The label disappears and is placed in the clipboard of the computer, but the combo box itself stays behind. This might be useful in some scenarios to have only the combo box visible, but for this example we want to remove the entire combo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

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



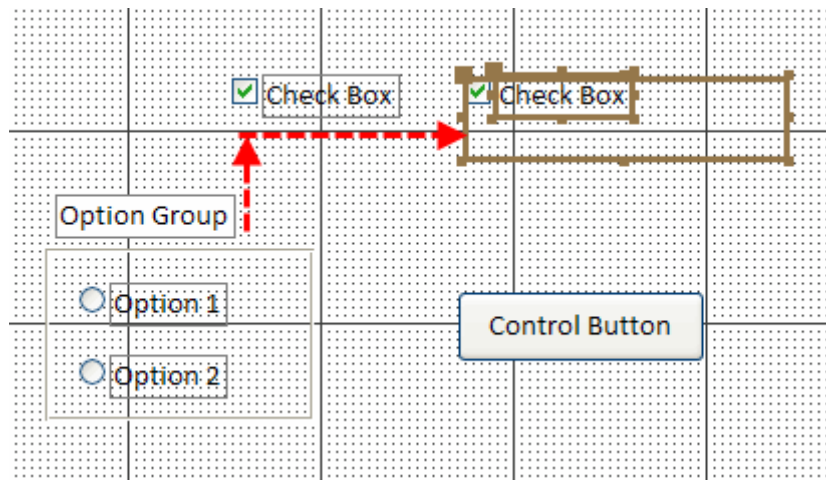
Now press Ctrl + X to cut the control. If you are planning on removing the combo box for good, you might consider just deleting it instead; simply highlight the object(s) and press Delete on your keyboard.

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:

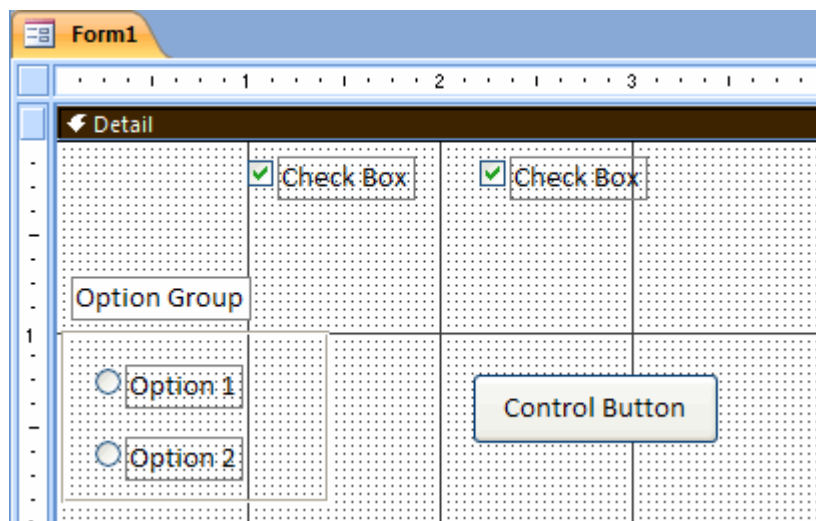


The new check box is pasted, but doesn't look very good when pasted on top of another control!

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

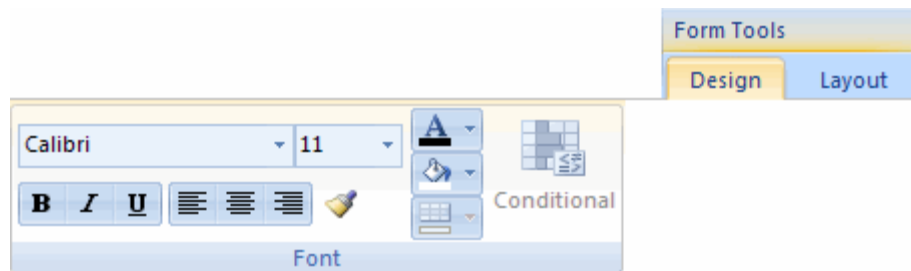


Now all of the controls in the form can be moved up to occupy the space left behind by the combo box. Click and drag a selection box around all of the controls, and then use the up arrow on your keyboard to shift all of the controls to the top of the form:



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.

3.2: 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 a web application window titled "Employee Details". At the top, there is a header bar with a small globe icon, the name "Nancy Freehafer", and a "Go to" dropdown menu. Below the header, there are several action buttons: "E-mail", "Create Outlook Contact", "Save and New", and "Close". The main content area is divided into two tabs: "General" (selected) and "Orders". The "General" tab contains several sections of form controls:

- Personal Information:** 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 (empty), Fax Number ((123)456-7890).
- Address:** Street (123 Any Street), City (Any City), State/Province (WA), Zip/Postal Code (99999), Country/Region (USA).
- E-mail and Web Page:** E-mail (nancy@northwindtraders.com), Web Page (http://northwindtraders.com).
- Notes:** A large text area for notes.

At the bottom of the form, there is a status bar showing "Record: 1 of 9", navigation buttons, and a search field.

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:

The screenshot shows the 'Employees' table in a database application. A red arrow points to the 'Employees' tab, and another red arrow points to the first row (ID 1) in the table. Below the table is the 'Employee Details' form for Nancy Freehafer. The form has a header with the employee's name and a 'Go to' dropdown. Below the header are tabs for 'General' and 'Orders'. The 'General' tab is active, showing fields for First Name, Last Name, Company, Job Title, E-mail, and Web Page. The E-mail field is populated with 'nancy@northwindtrade.com' and the Web Page field with 'http://northwindtrade.com'.

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

Employee Details

Nancy Freehafer

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

General Orders

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

E-mail: nancy@northwindtrade.com Web Page: http://northwindtrade.com

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

The screenshot shows the 'Employee Details' form in Design view. The form has a header section with a title bar and a detail section with a grid of controls. The title bar contains the text '=Nz([Employee Name], "Untitled")' and '=If(DCount("[Employee Name]", "[Employees]", "[Employee Name] = [Employee Name]") > 0, "[Employee Name]", "[Employee Name]')'. The detail section contains a grid of controls for the 'General' tab, including fields for First Name, Last Name, Company, Job Title, E-mail Address, and Web Page. The 'Attachment' section is also visible.

Employee Details

Form Header

Detail

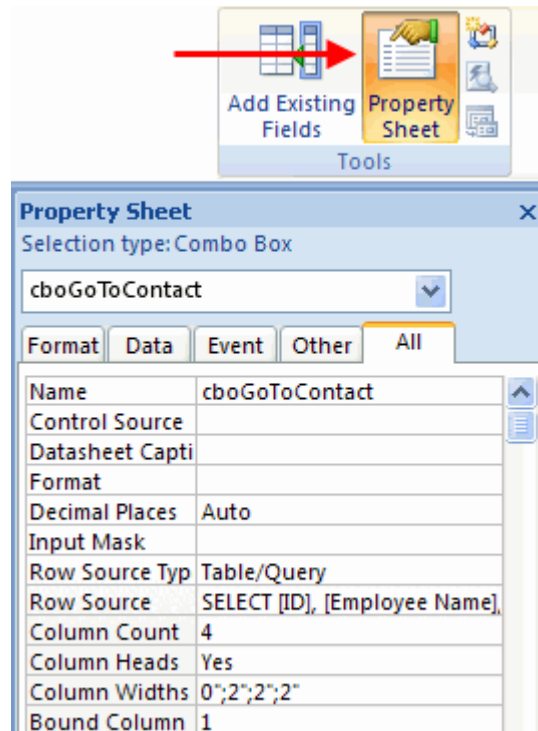
General Orders

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.).

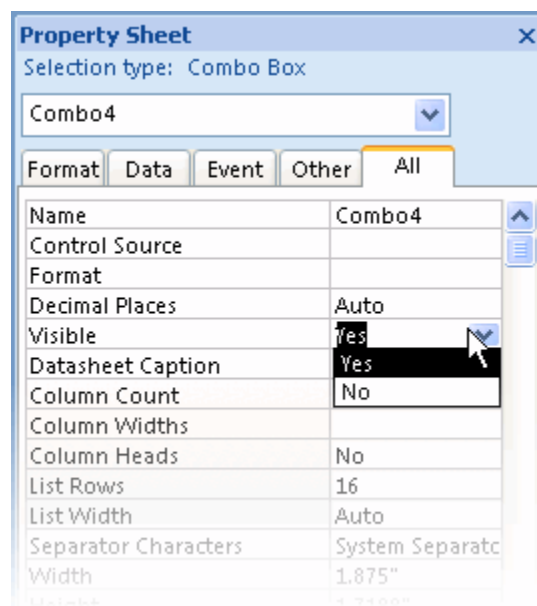
Other Tab

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.

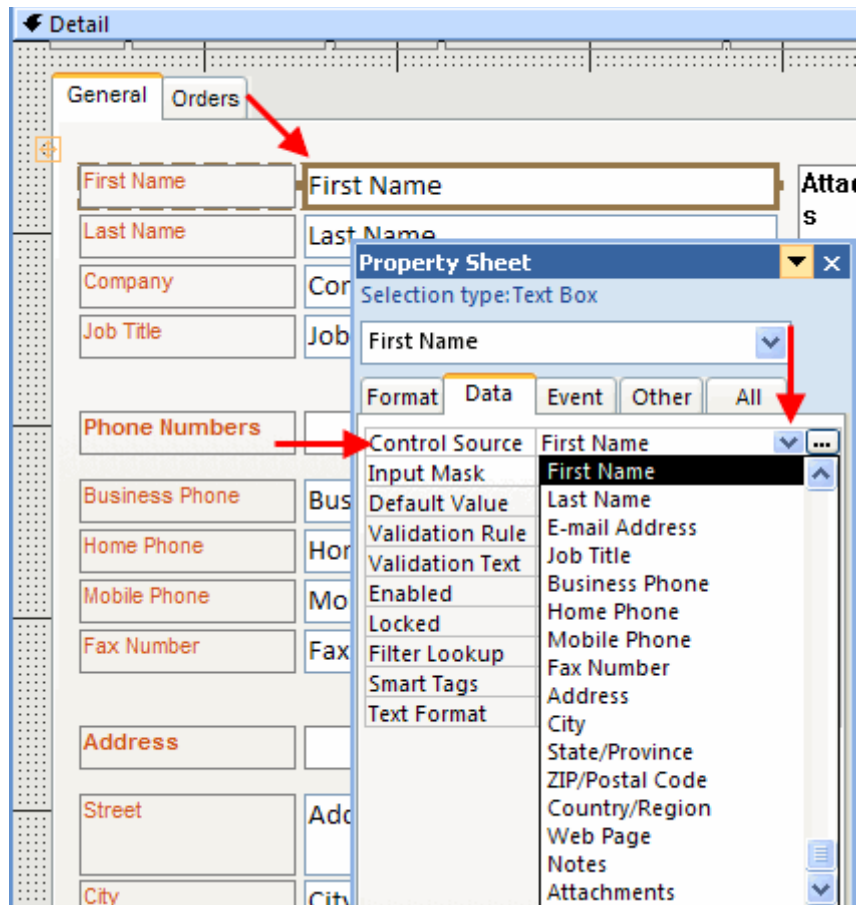



Changing a Control's Data Source

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.

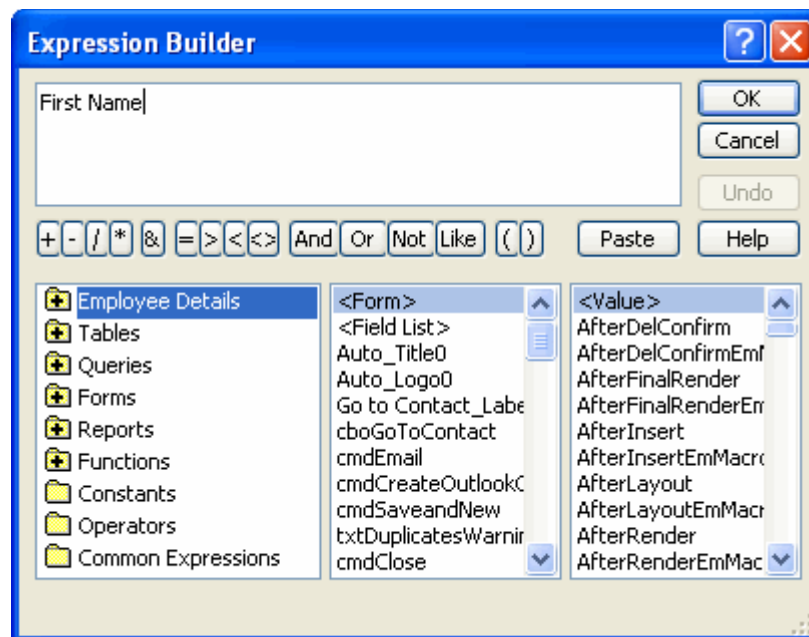
Access makes it very easy to change the control source of an object. First, open the form in Design view, click the object that you want to change the data source, and click the Property Sheet command in the ribbon. When the Property Sheet pane appears, click the Data tab.

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:



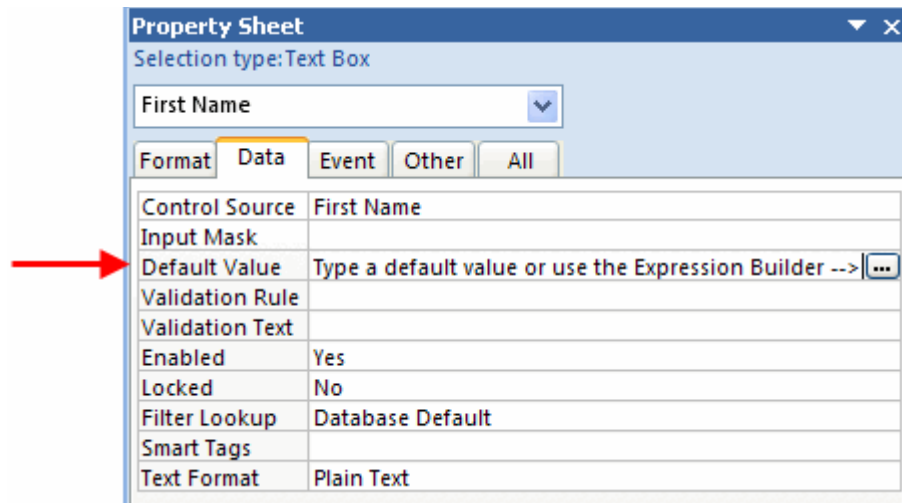
The Expression Builder lets you do a number of things. You can construct logical expressions, extract information from queries, and create calculations. In the diagram above, the new control source would be the first name of an employee. This application doesn't make much sense, but the Expression Builder 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.

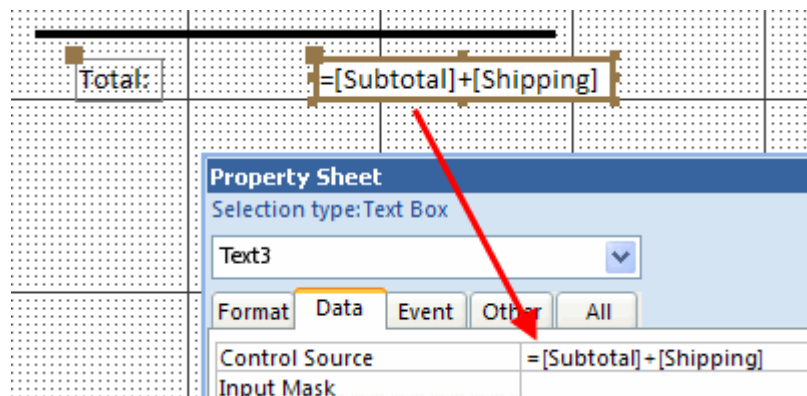
Creating a Calculated Control

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:

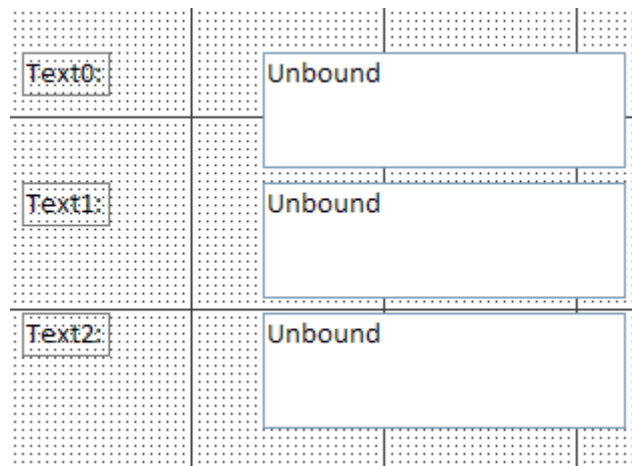
Subtotal:	499.99
Shipping:	35.88
<hr/>	
Total:	535.87

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

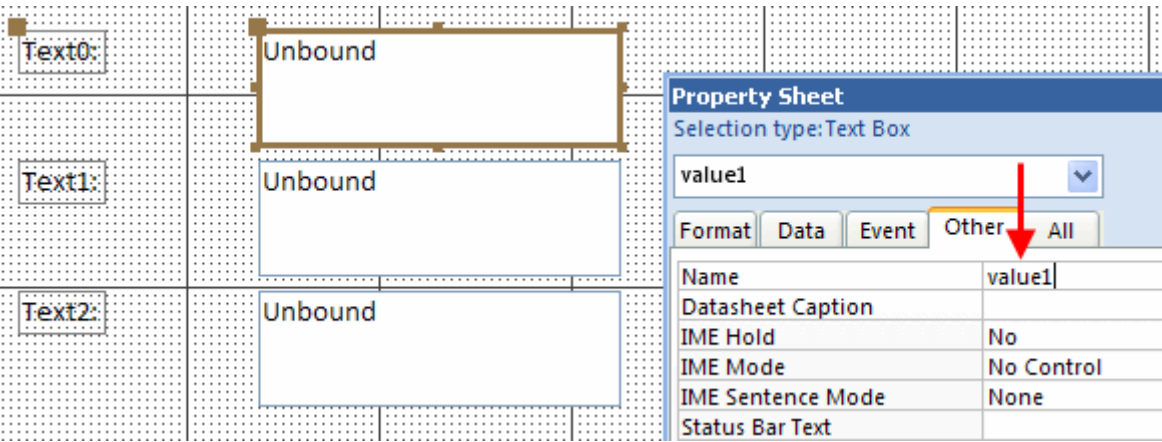
More specifically, the Total text box contains a mathematical expression as the Control Source property.



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.



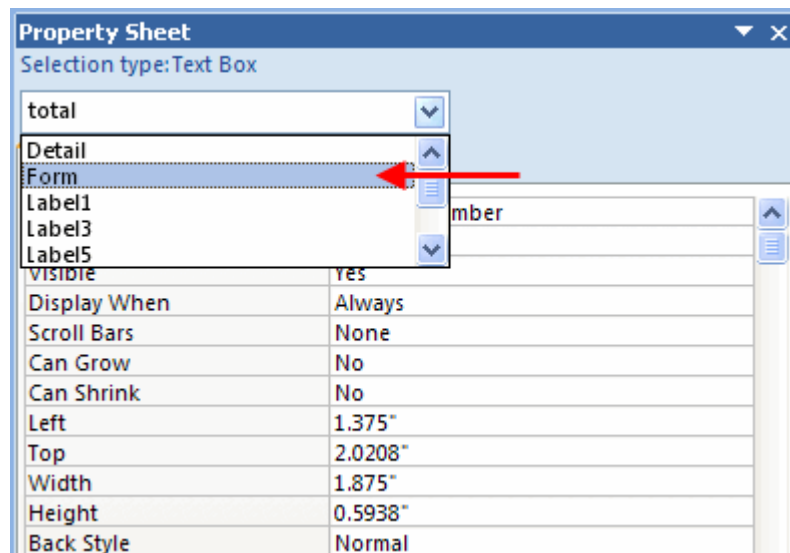
Repeat for the second and third text boxes, naming them value2 and total respectively. Now, change the Format of each text box to General Number (in the Format Tab). Click the Data tab for the total text box and enter =[value1]+[value2] into the Control Source field.

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"/>

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:



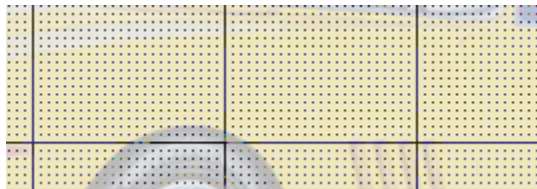
There are almost 120 properties that can be modified in a form. The majority of the properties you can modify go beyond the scope of this manual, but Access offers many examples of different settings in its help file. Be it a table, form, query, or report property, when your cursor is inside a property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

3.3: Formatting Your Form

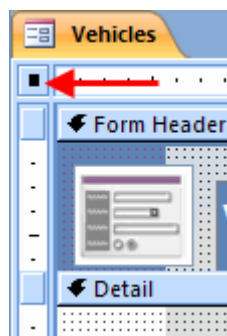
We have seen how to adjust the properties of the controls in a form. In this lesson we will explore a few more useful options and customizable features of forms.

Formatting Gridlines

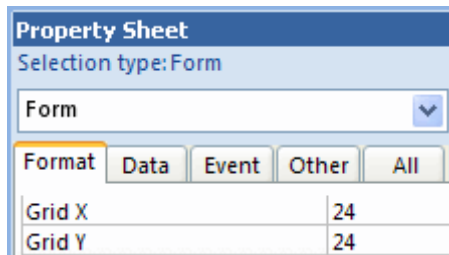
If you have tried to move a control using your mouse, you have no doubt become a little frustrated trying to get everything lined up neatly. Fortunately, Access gives you the ability to use the grid layout that is visible in form Design view:



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:

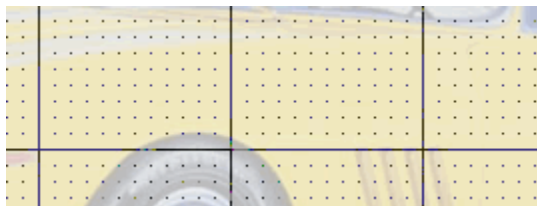


Click the Format tab in the Properties window and scroll down until you can see the Grid X and Grid Y properties:

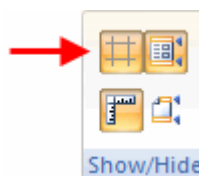


The numbers in each field denote how much you can subdivide the 1" square grid visible in Design view. The default value is 24, meaning that the space between the dots is 1/24th of an inch. You can adjust these properties from 1 to 64. Both values can be adjusted independently, though it is a good idea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

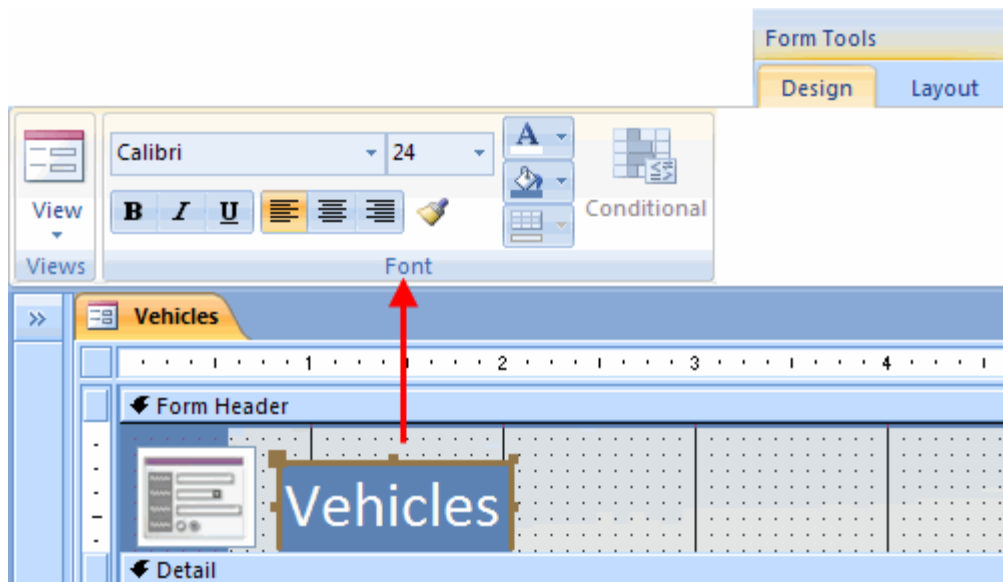


If you want to turn off the gridlines completely, click the Show Grid command in the Form Tools - Arrange ribbon:



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:

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

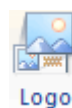
Double-click the Format Painter () command in the Font section of the ribbon. Now click every control that you want to look the same:

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

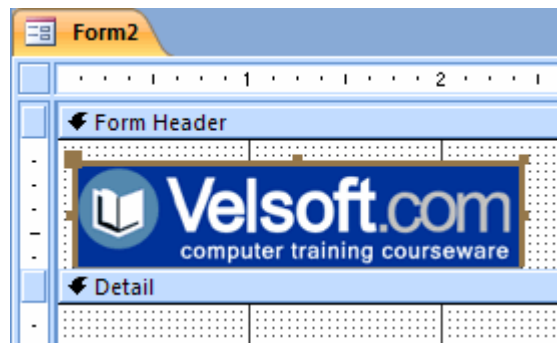
When you have finished using the Format Painter, click the command once more to stop using it. If you only want to use the Format Painter once, click one object (and modify it to your liking), click the Format Painter command once, and then click another object. This will copy the formatting from one 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 contains a ready-made logo command in the Form Tools - Design ribbon.

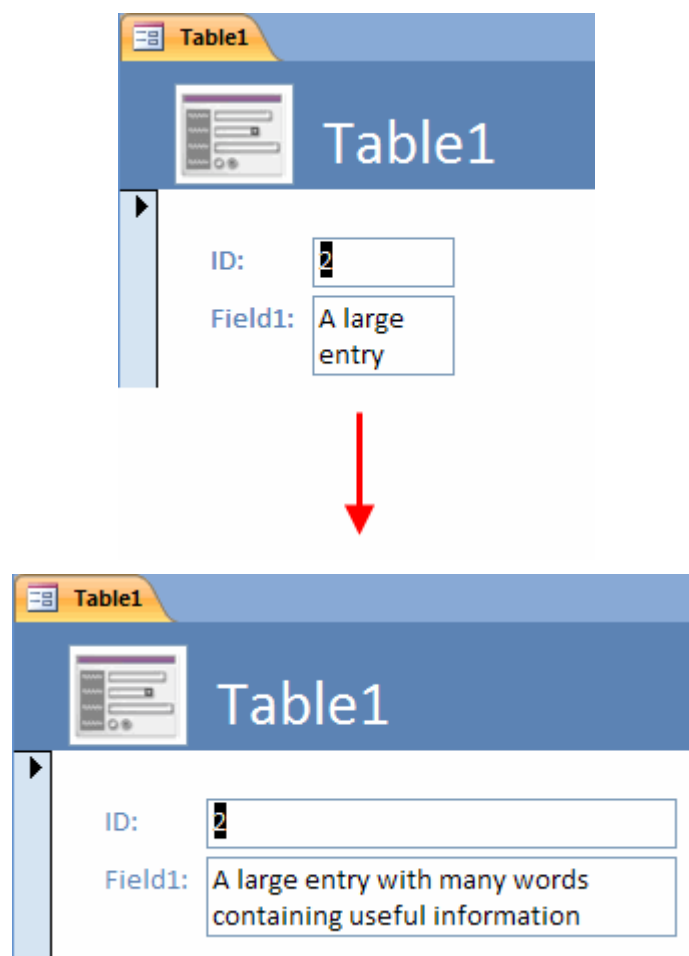


Click the command to open the Insert Picture dialogue box. Navigate to the picture file you wish to use as the logo. Access automatically expands the Form Header section of the form and inserts the picture for you:



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, 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:



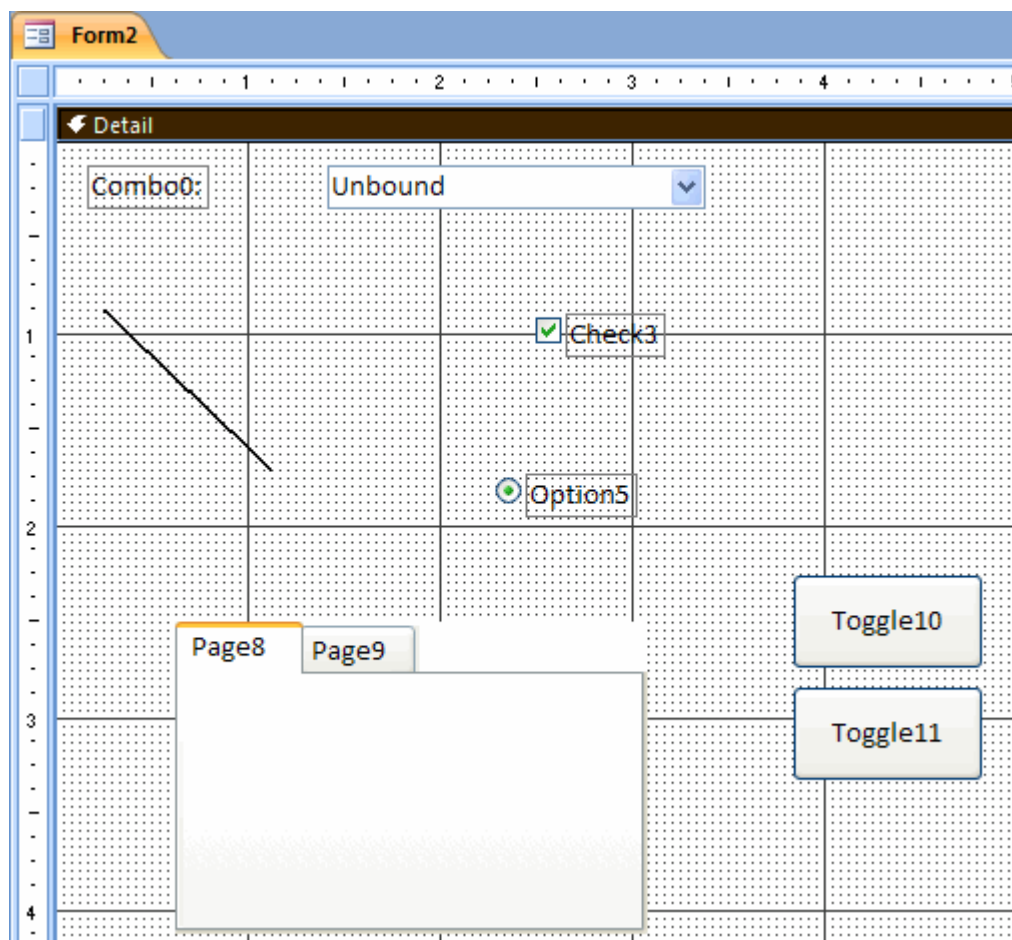
Using Layout view, along with other techniques such as changing the resolution of the formatting grid, lets you create a form exactly to your liking. If you don't like a certain change you made, press Ctrl + Z on your keyboard to undo the operation.

3.4: 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:

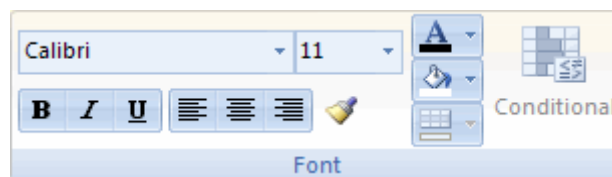


The only one of the controls that cannot be modified are the tabs of the Tab Control object (with Page8 and Page9 as the tabs). Anything inside the tabs can, however, be modified.

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

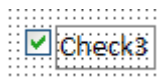


Any of the other controls that include text of some sort can be modified by using the Font section of the ribbon:



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

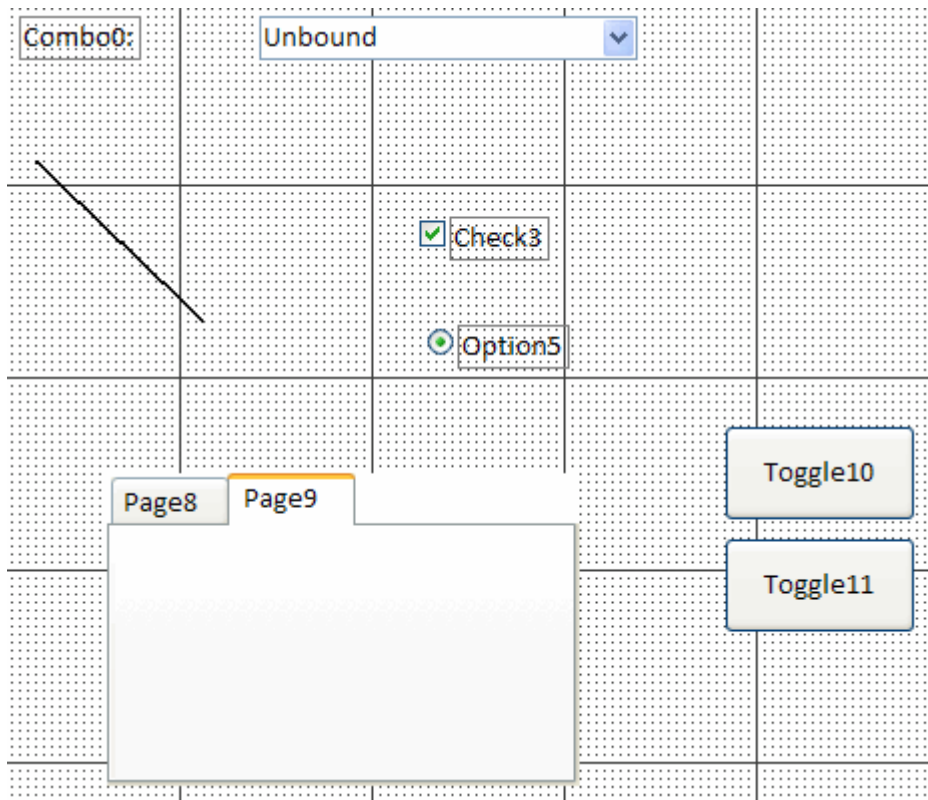
You can modify other properties of the check box such as its name, if it can be reached and interacted with when the Tab key is pressed, and if it will display text in the Status Bar. (The status bar is visible at the bottom of the Access window while in Form view. It tells a user what the control does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


All Tab

All controls combined.

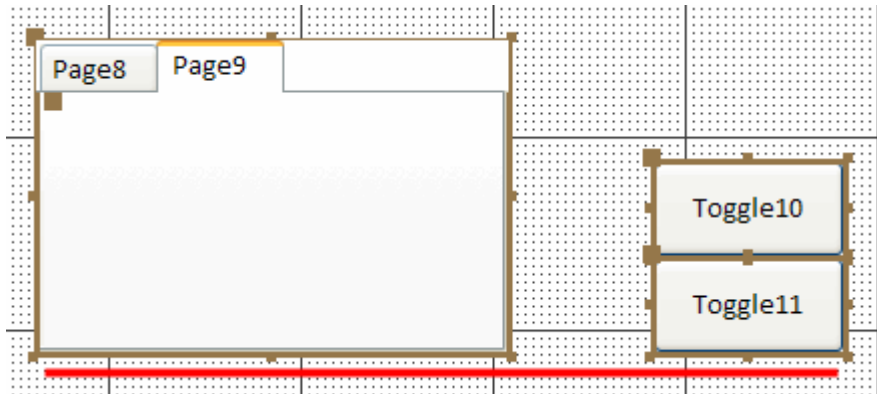
Aligning Controls

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:

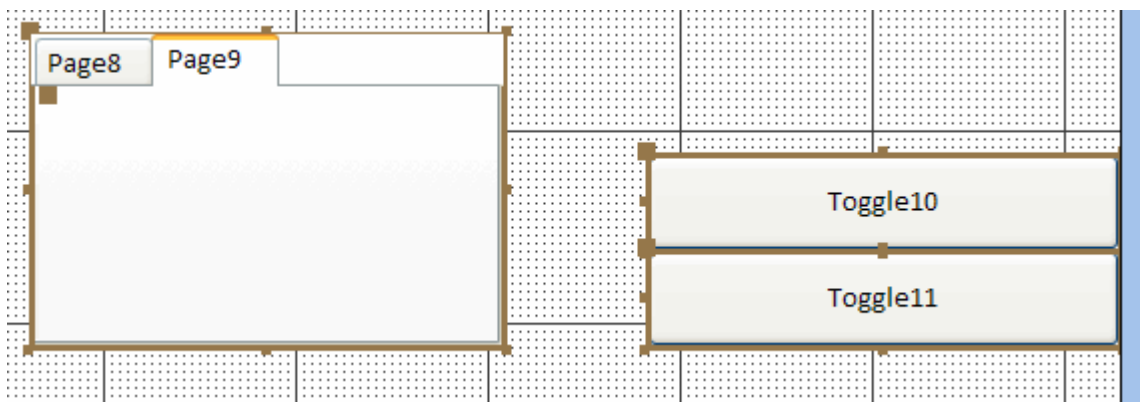


We will cover the full functionality of the Layout ribbon in the next lesson. For now, select two objects like the control group and toggle buttons. Click the Bottom command ( Bottom) in the Control Alignment section of the ribbon.

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



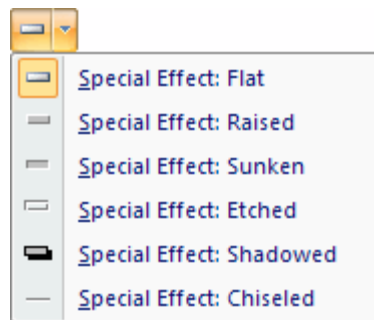
Clicking the To Widest command expands all controls to the same width as the widest one currently selected:



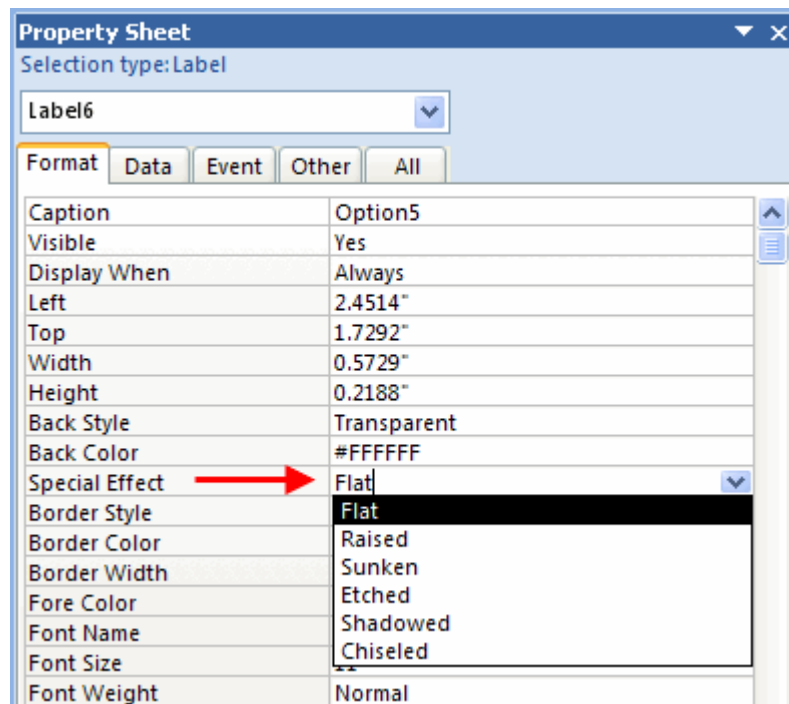
Applying Special Effects

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:

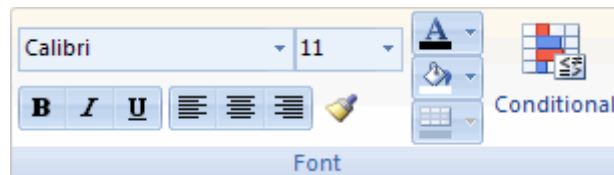


3.5: Formatting Records

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

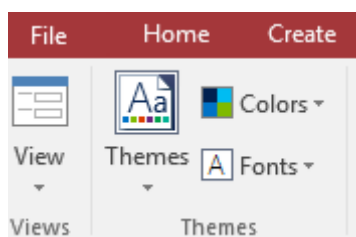
When you first begin making forms, you will likely use the form Wizard to get you started. However, the Wizard may not provide the functionality you need. Designing forms by hand is a bit more time consuming, and sometimes making a form look a bit presentable gets pushed down the list of importance. 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 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 choose a different Theme and Colour set from the Design tab.



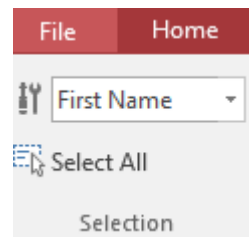
Themes allow you to change the overall design of your database including sets of colours and fonts.

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:

Selection

Use the object navigator to select an item on the form.
Click Select All to select all form items.



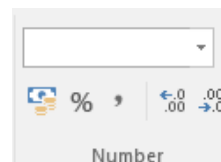
Font

This section is used to modify the font and style of text.



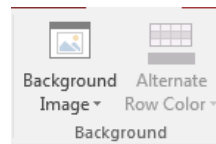
Number

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.

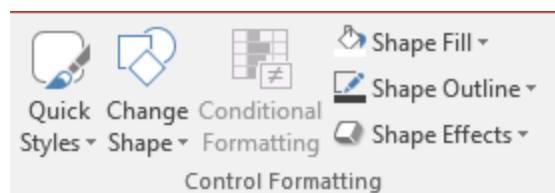


Background

Background allows a background image to be applied to the form background. Alternate Row Colour allows the banded colour to be changed.



Control Formatting This section allows you to change the style and formatting of form controls. Conditional command is used to apply different formatting 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.

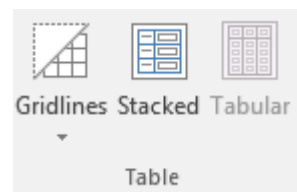


Using the Arrange Ribbon

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

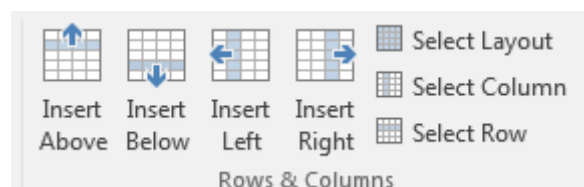
Table

This section allows you to select the style of gridlines on the form background. Stacked creates a layout where fields have labels next to each form and where fields can be resized all at once as one stack. Tabular creates a layout similar to a table with captions above each field.



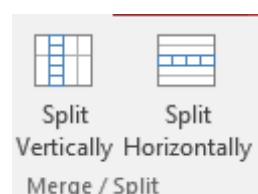
Rows & Columns

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.



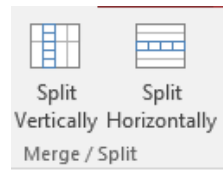
Merge / Split

This command splits a controls in half horizontally or vertically.



Move


This section allows a control to be moved up or down



Unit 3: Review Questions

1. **Which objects can be copied and pasted in a form?**
 - A. Combo boxes
 - B. Check boxes
 - C. Radio buttons
 - D. All of the above




2. **Which of the following formatting changes can be applied to a control containing text in a form?**
 - A. Font
 - B. Background color
 - C. Orientation
 - D. All of the above

3. **What does the following icon do?** 
 - A. Lets you select a record from a table
 - B. View and modify an object's properties
 - C. Run a query to get data from a form
 - D. None of the above

4. **What is the purpose of a default value?**
 - A. It is designed to hold a value in a field that can be modified or left as is
 - B. It lists the primary key of a table that the form is based upon
 - C. It is designed to give a description of a field
 - D. None of the above

5. **A calculated control...**
 - A. Can be made when you would like to perform a mathematical operation
 - B. Can be placed anywhere in a form
 - C. Can perform a logical operation like greater than (>)
 - D. All of the above

- 6. What is the maximum resolution of gridline that can be applied to a form?**
- A. 1/8 of an inch
 - B. 1/24 of an inch
 - C. 1/64 of an inch
 - D. 1/128 of an inch

7. What is the  icon called?
- A. Format Paster
 - B. Format Painter
 - C. Format Holder
 - D. Format Copier
8. When modifying control properties, what does the  icon do?
- A. Opens a Wizard or external resource to set the property
 - B. Adds a new data type to a field
 - C. Lets you save the file in a different location
 - D. Uploads the current database object to a SharePoint server
9. What does the  Bottom icon do to a group of selected controls?
- A. Aligns all controls in a form with the bottom of the Access window
 - B. Aligns all controls in a form with the bottom of the form
 - C. Aligns all controls in a form with the bottom-most control
 - D. None of the above
10. Which of the following is the correct functionality of the Anchoring command?
- A. Anchors all commands so they cannot be moved until unanchored
 - B. Anchors all commands in one section of the form
 - C. Anchors the sections of the form so they cannot be modified
 - D. Anchors one command to another such that the child receives the same formatting changes as the parent

UNIT 4: Working with Reports

In this section you will learn how to:

- Recognize the different report sections
- Group and sort data in a report
- Create a calculated control in a report
- Adjust the look and feel of a report
- Add images to a report
- Adjust header and footer properties
- Make page numbers
- Create mailing label reports

4.1: Organizing Report Data

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

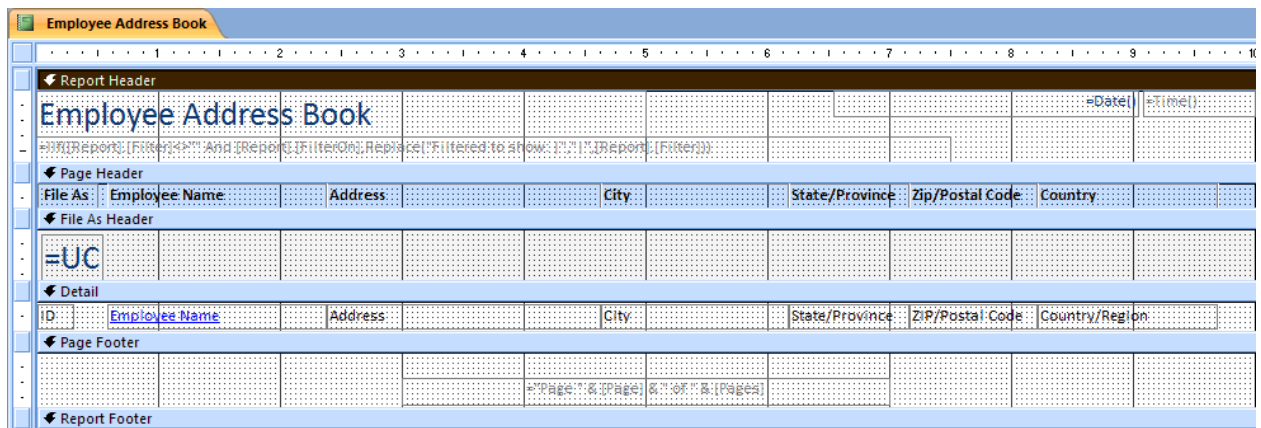
Creating reports using Access is very similar to creating forms. If you used the report Wizard, Access prompted you to select fields from different tables or queries in your database. If you first opened a table or query and clicked the Report command (in the Create ribbon), Access automatically generated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

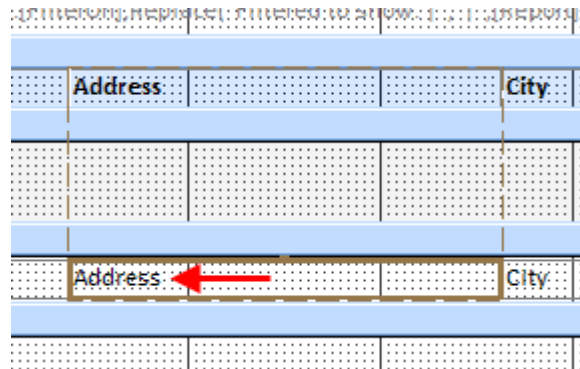


File As	Employee Name	Address	City	State/Province	Zip/Postal Code	Country
C						
	Andrew Cencini	123 Any Street	Any City	WA	99999	USA
F						
	Nancy Freehafer	123 Any Street	Any City	WA	99999	USA

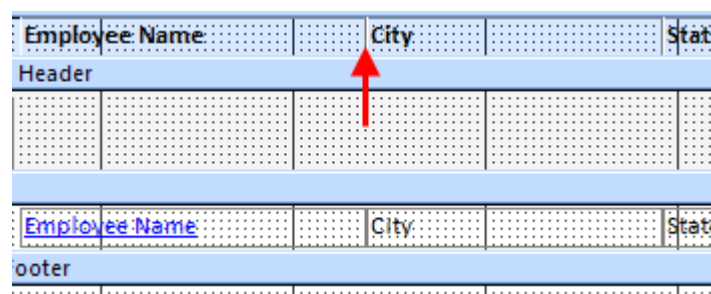
Now let's look at the same report in Design view:



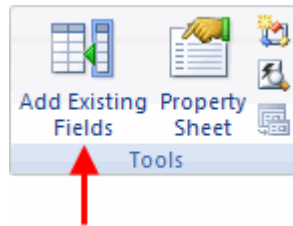
The data contained in this report is in the Detail section. It contains fields from the Employees table that are useful to the application of the report. Now imagine you want to exchange the Address field for the E-mail Address field. While in Design view, click the Address field in the Detail section:



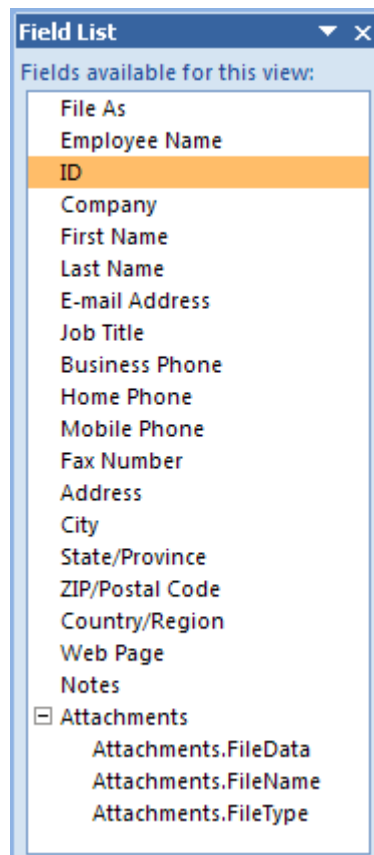
The Address field is the actual field that is selected, but notice how the Address field label is also highlighted to show the two are linked together. To remove the field, press Delete on your keyboard. The rest of the fields all shift to the left to fill in the hole left from the Address field:



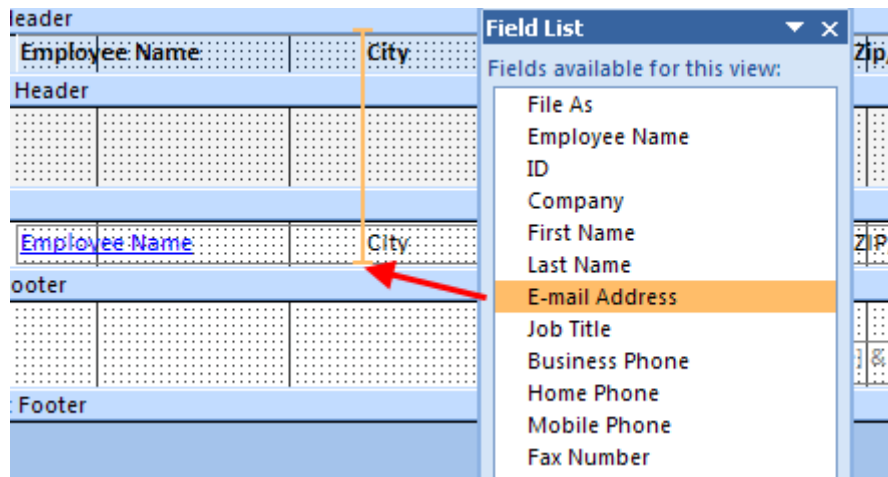
Now let's add the E-mail Address field. Click the Add Existing Fields command in the Tools section of the Report Tools - Design ribbon:



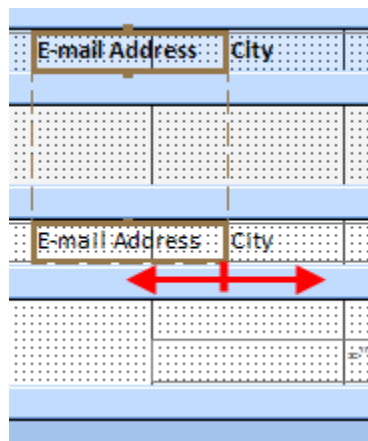
This will open the Field List pane. It contains all of the available fields from the object(s) that was used to create the report; in this case, the Employees table:



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:

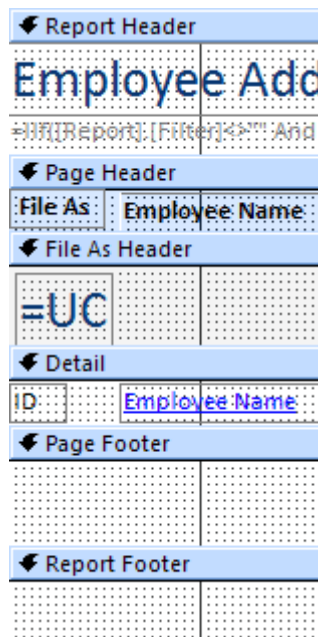


Once the field has been placed, you can drag the size of the field larger or smaller to accommodate the data contained inside. Place your mouse on the brown border of the E-mail Address field and drag to the left or right:



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:

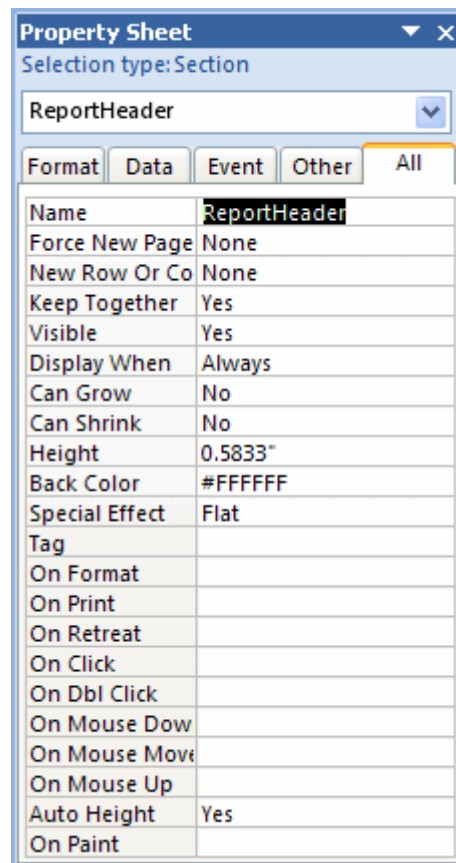


- Report Header** Objects in this section will be visible at the very beginning of a report. You can use this like a title page.
- Page Header** Objects that will appear at the top of every page, and under the Report Footer of the first page. In this example, the field names constitutes the Page Header
- 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:



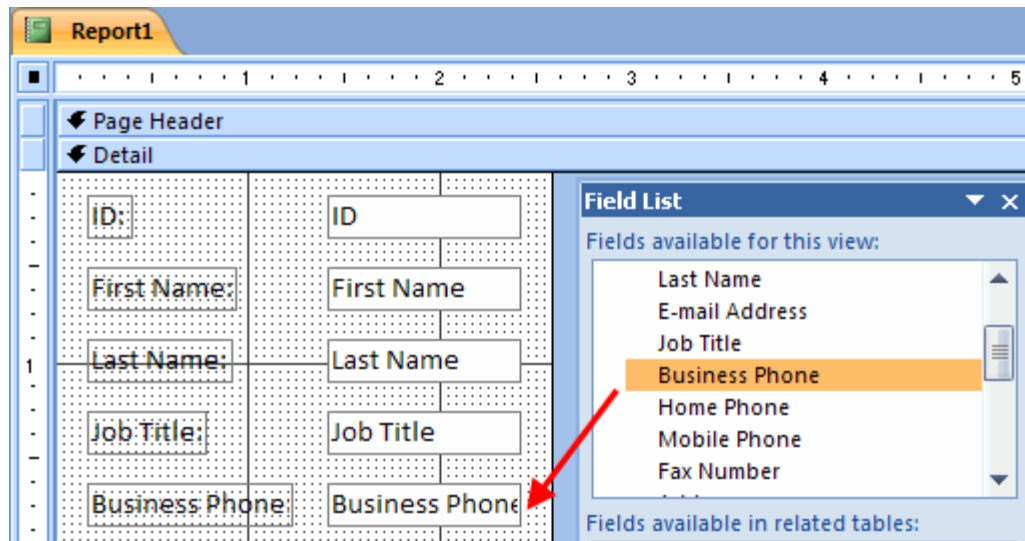
By nature, reports are primarily used to display data only. Therefore, there aren't as many properties to modify compared to other objects in Access. The properties of a report section are enough to modify the look and feel or allow the section to shrink or grow to accommodate its contents.

Grouping and Sorting in a Report

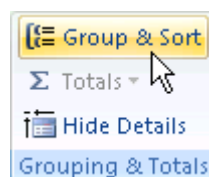
The Employees Address Book report contained an extra header that grouped all employees together in alphabetical order. The alphabetical listing also made a different header. We will now explore how to group certain records contained in a

report together and explore how to make a customized report header later in this manual.

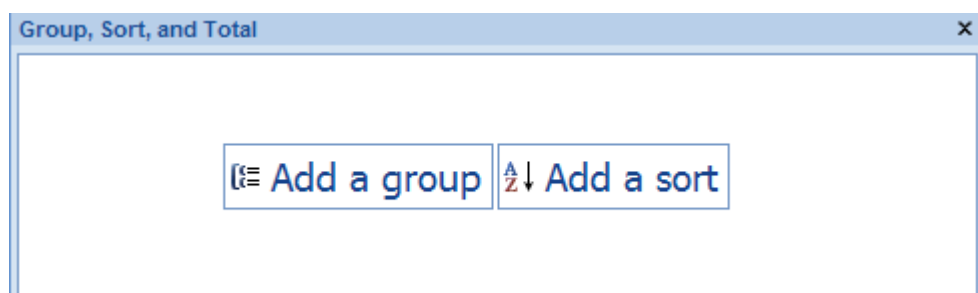
Consider the following simple report:



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:

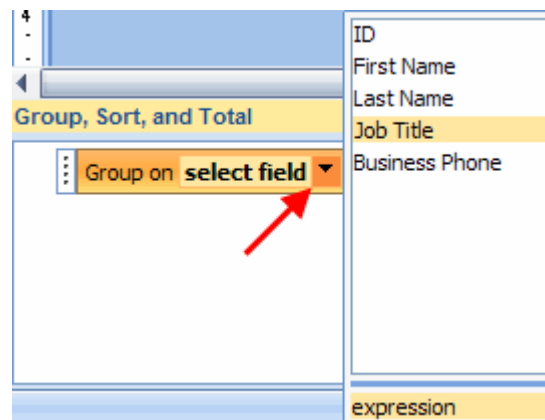


At the bottom of Design view, you will see the following Group, Sort, and Total section:

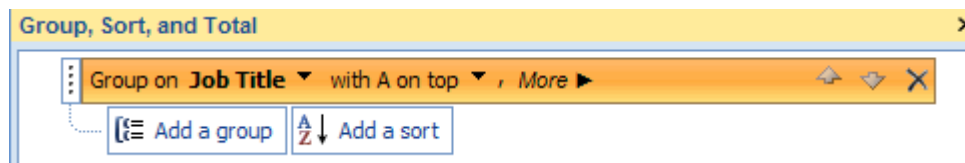




Click the Add a group button. Click the pull-down arrow beside Group on: and select the field you wish to use as the grouping control; Job Title in our example:



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:



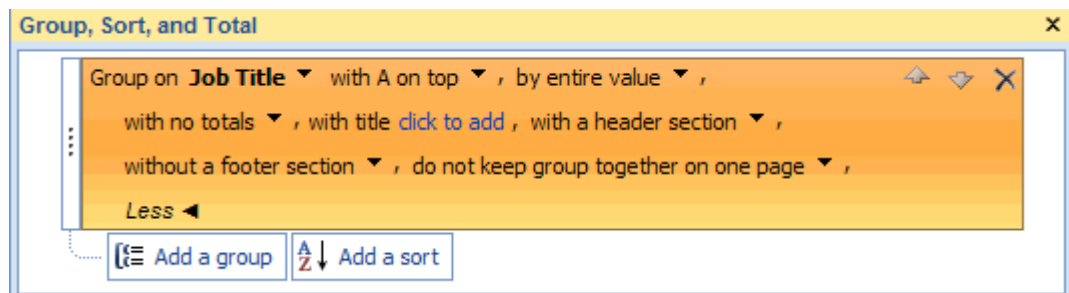
Now that the grouping is applied, switch back to Report view.

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

Report1	
ID:	8
First Name:	Elizabeth
Last Name:	Andersen
Job Title:	Purchasing Rep ←
Business Phone:	(123)456-7890
ID:	13
First Name:	Andre
Last Name:	Ludick
Job Title:	Purchasing Rep ←
Business Phone:	(123)456-7890
ID:	16
First Name:	Daniel
Last Name:	Goldschmidt
Job Title:	Purchasing Rep ←
Business Phone:	(123)456-7890

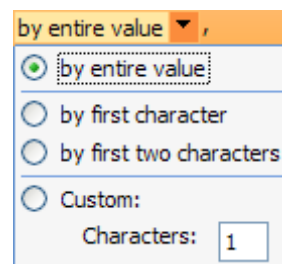
Changing Group Properties

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.

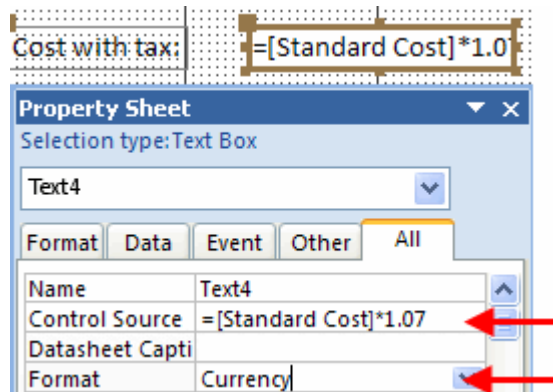



Using Calculated Controls in a Report

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:

A screenshot of a Microsoft Access report titled 'Report1'. The report has a 'Page Header' section and a 'Detail' section. The 'Detail' section contains a table with three columns: 'ID', 'Product Name', and 'Standard Cost'. The 'ID' column has a single row with the value '1'. The 'Product Name' column has a single row with the value 'Product Name'. The 'Standard Cost' column has a single row with the value 'Standard Cost'. The report is displayed in a design view with a grid background.

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:



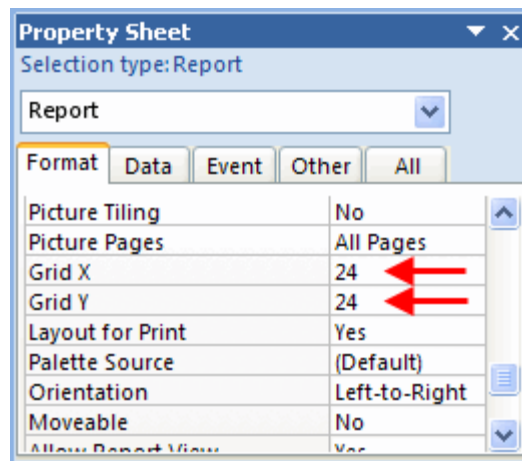
Most of the calculated controls you will create in a report will be fairly simply arithmetic expressions. Should you need to create more complex expressions, use the Expression Builder by clicking  in the Control Source field. The one thing to remember when creating calculated controls is to make sure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

Lesson 4.2: Formatting Reports

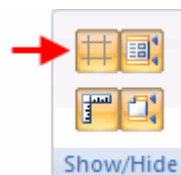
We have seen that building reports and forms is a pretty easy job with a little planning and care. Once you have decided what information you would like in the report and have added the elements, you can begin the task of making your report look nice.

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:

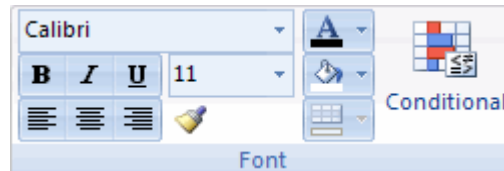


Enter a number from 1 to 64 to divide each square inch of the report into that many increments. If you would rather work without the gridlines, click the Gridlines command in the Show/Hide section of the Report Tools - Arrange ribbon:



Modifying the Font

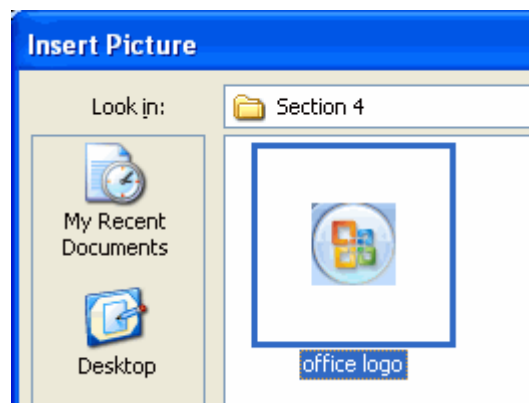
Modification of a font in a report is as simple as highlighting the control or object you want to format and then using the Font section of the Report Tools - Design or Home ribbon:



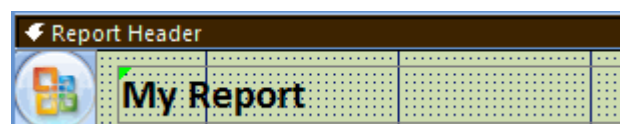
If you don't like the style of a control, simply change the control back to what it was or use the Undo Command (Ctrl + Z on your keyboard). Remember that you can use the Format Painter to change the look of many objects with a single click.

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:



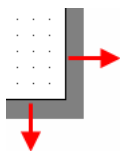
Changing the Layout

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.

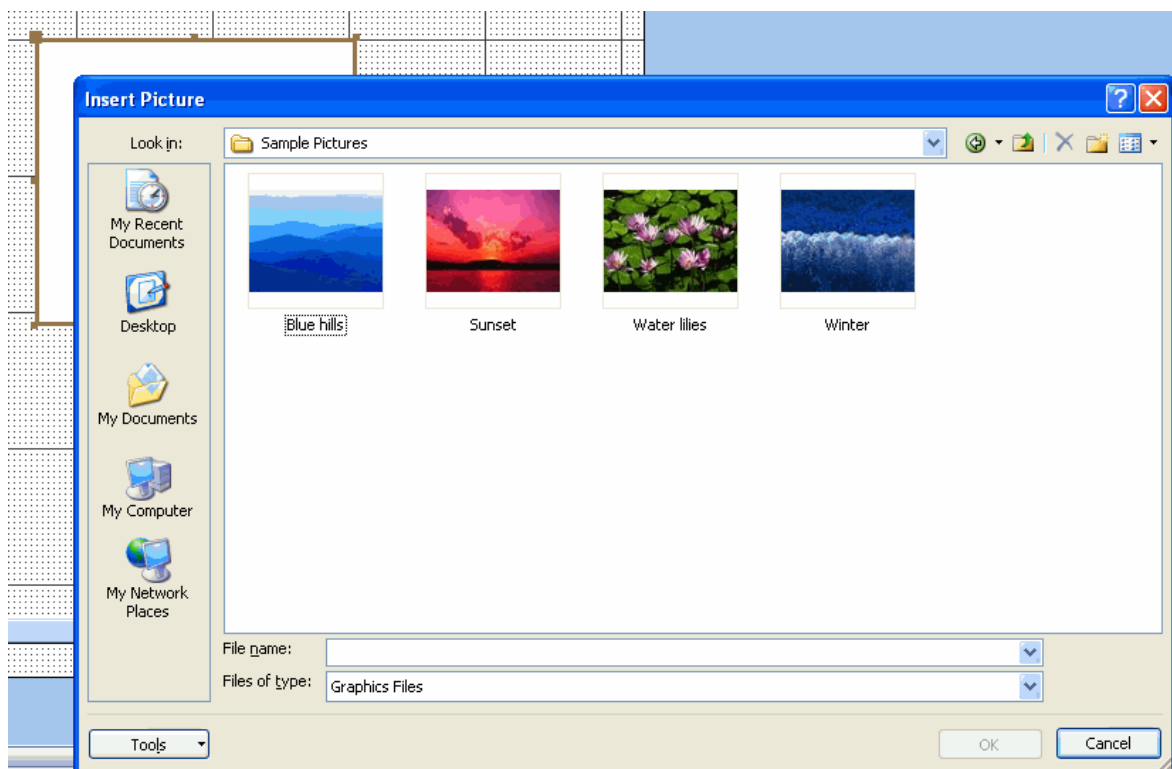
Remember that you can either backup the database before you perform a lot of operations or save a copy of a particular database object before you start working. Should you get in over your head, you can always pull out the backup and try again.

4.3: 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

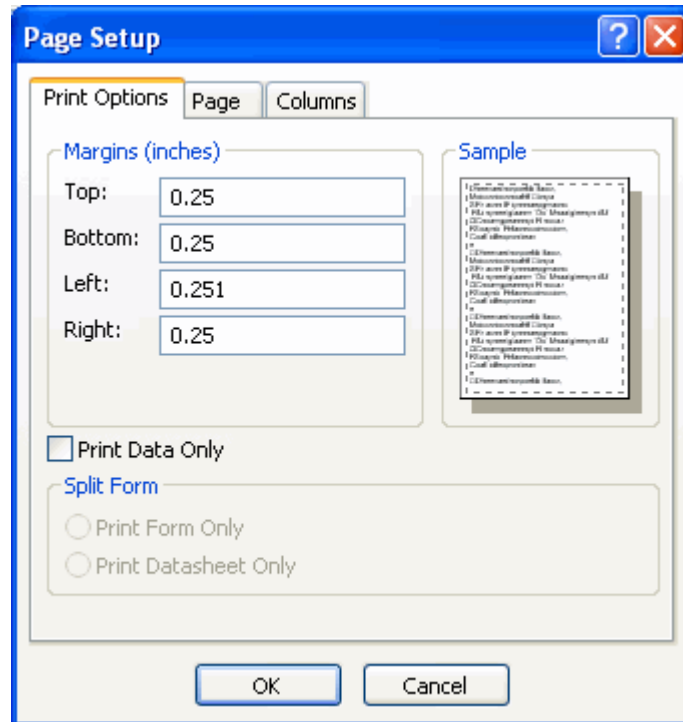
Adding a photo to a report is just like adding any other control to a report. To add a photo, click the Image command in the Report Tools - Design ribbon and then click and drag somewhere in the appropriate section you want the photo to appear:



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 Setup

Access 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:

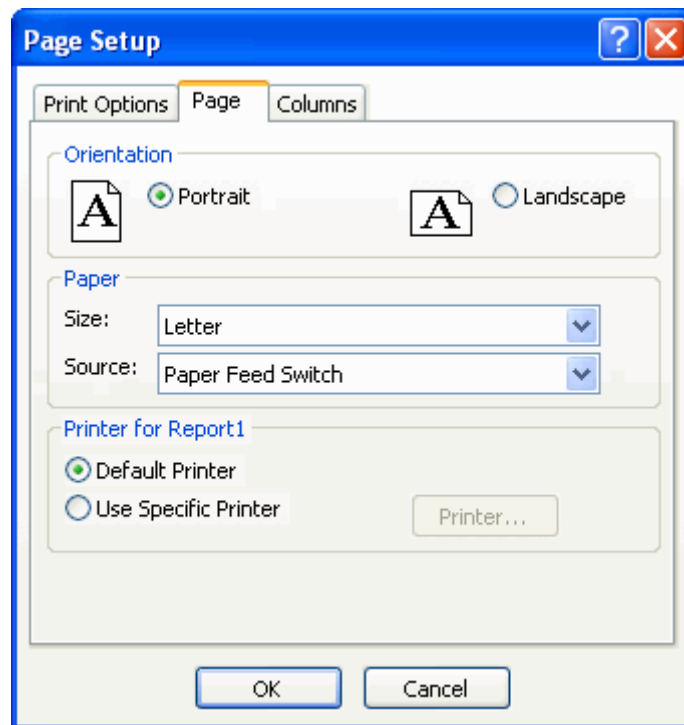


Print Options Tab

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.

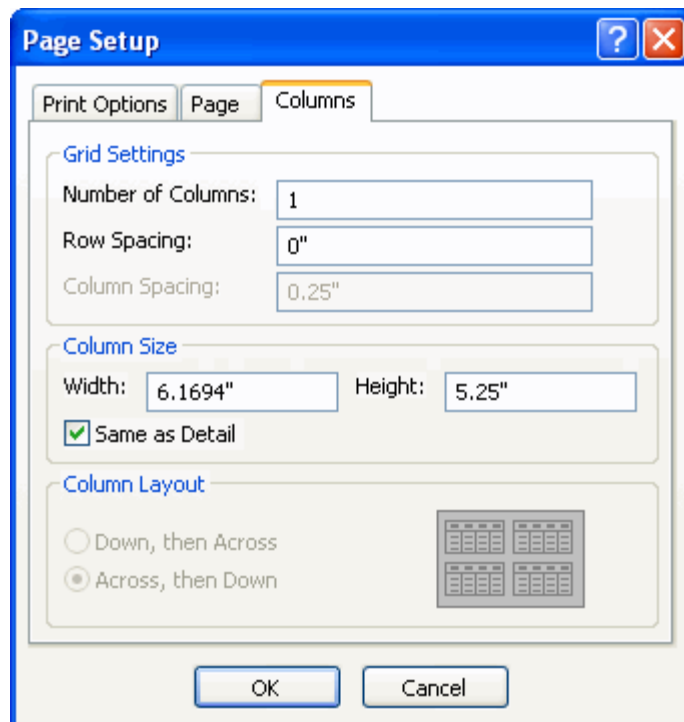


Columns Tab

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.

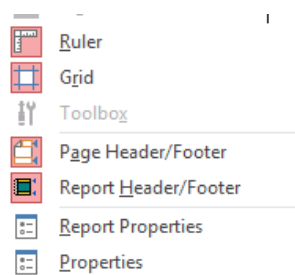
The column size fields specify how large you would like each page of the report to be on the printed page. You can also check the Same as Detail checkbox to make the printed size the same as the current dimensions of the Detail section.

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

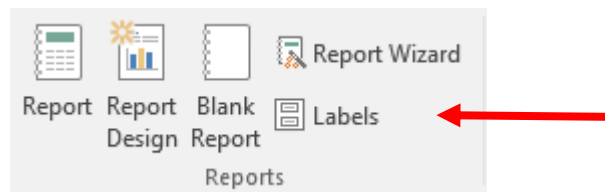
One of the nice things about databases on computer is that they allow you quick access to a lot of data in a hurry. If you were the marketing manager of Northwind and wanted to send a catalogue out to all of your customers, it would take you hours to type or copy and paste the addresses into a word processing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

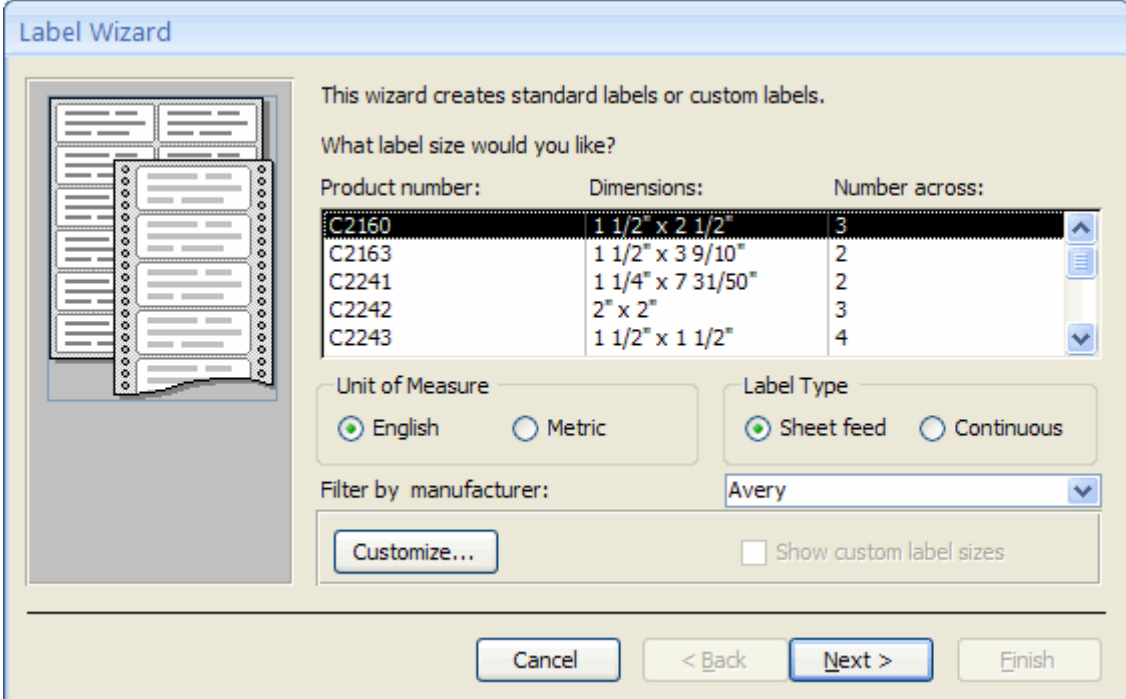
www.MicrosoftTraining.net 0207 987 3777



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:



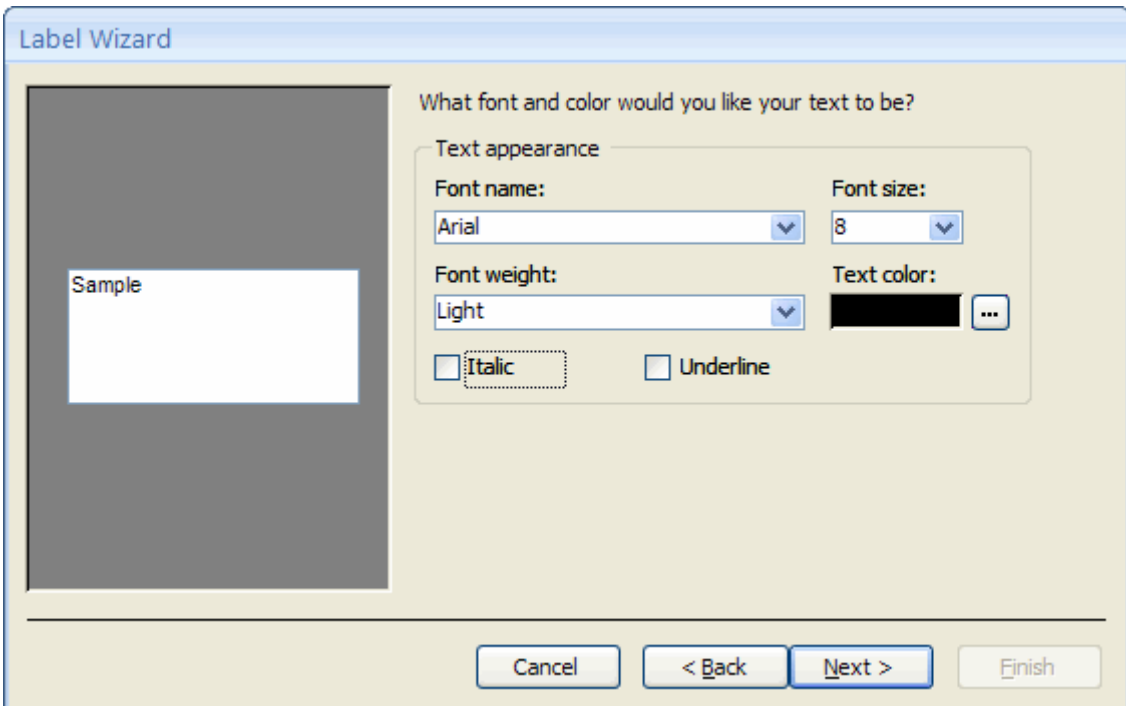
The first step of the Label Wizard asks you what sort of labels you want to use:



The Label Wizard dialog box is titled "Label Wizard". It contains a preview of various label sizes on the left. The main area asks "What label size would you like?" and displays a table of options. Below the table are options for "Unit of Measure" (English selected, Metric unselected), "Label Type" (Sheet feed selected, Continuous unselected), and a "Filter by manufacturer:" dropdown set to "Avery". There is a "Customize..." button and a checkbox for "Show custom label sizes". At the bottom are "Cancel", "< Back", "Next >", and "Finish" buttons.

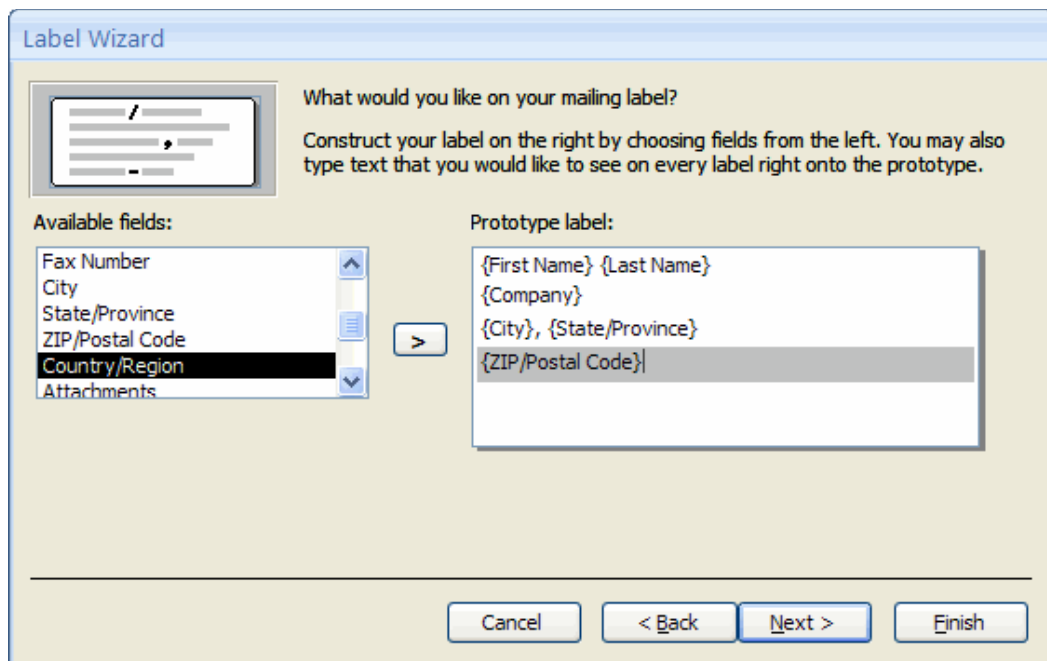
Product number:	Dimensions:	Number across:
C2160	1 1/2" x 2 1/2"	3
C2163	1 1/2" x 3 9/10"	2
C2241	1 1/4" x 7 31/50"	2
C2242	2" x 2"	3
C2243	1 1/2" x 1 1/2"	4

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:



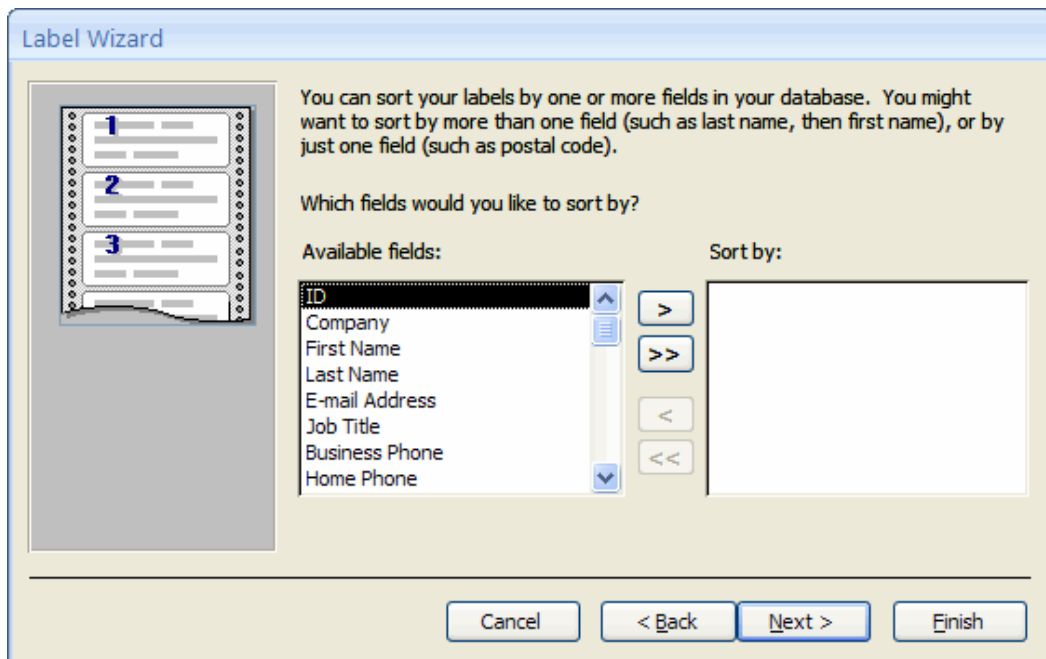
The Label Wizard dialog box is titled "Label Wizard". It contains a preview of a label with the word "Sample" on the left. The main area asks "What font and color would you like your text to be?". It includes a "Text appearance" section with fields for "Font name:" (Arial), "Font size:" (8), "Font weight:" (Light), and "Text color:" (black). There are checkboxes for "Italic" and "Underline". At the bottom are "Cancel", "< Back", "Next >", and "Finish" buttons.

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

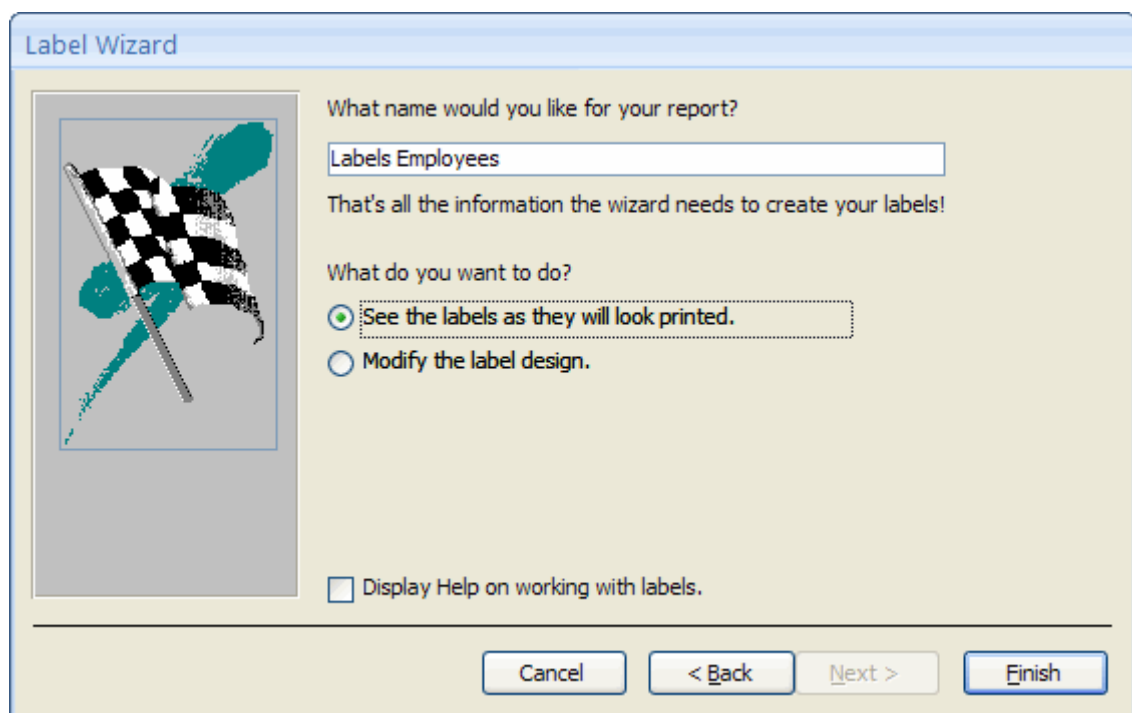


To build the label, click the one of the available fields and click the (>) button to transfer the field to the label. The currently active row is highlighted in grey. Click anywhere inside the prototype label diagram to make that row of text become active. At any point, you can also type any special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

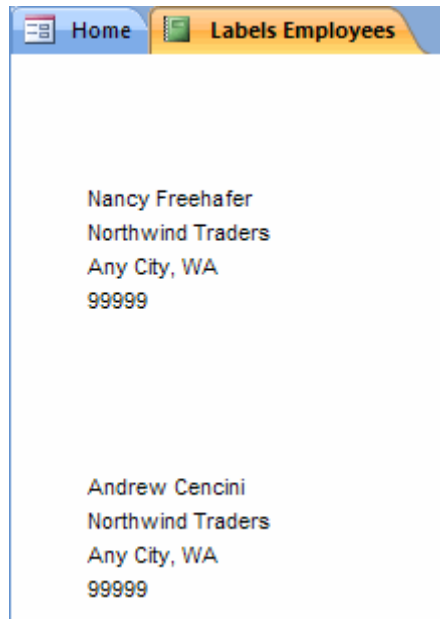
The next step of the Wizard allows you to sort the label order based on a sorting filter.



The 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.

Unit 4: Review Questions

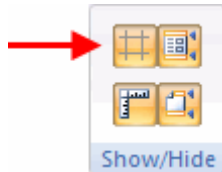
1. Which of the following is true of report headers?

- A. They are visible at the top of every page
- B. They are visible at the bottom of every page
- C. They are visible at the top of the first page
- D. None of the above

2. A Field or Expression can be grouped in a report. You can also sort in...

- A. Ascending order
- B. Descending order
- C. Neither A or B
- D. Both A and B

3. Which of the following describes the following command?



- A. Makes the grid disappear if already checked
- B. Makes the grid appear if already unchecked
- C. Can be used to make editing in Design mode by sight cleaner
- D. All of the above are true

4. What grid resolution works best with the rulers already present in report Design view?

- A. 1/4"
- B. 1/8"
- C. 1/16"
- D. 1/24"

5. Pictures can only be added to

- A. Page Headers
- B. Group Headers
- C. The Detail section
- D. Anywhere in a report

6. Which of the following statements is true when printing a report?

- A. Reports can be printed in landscape or portrait views

- B. Only the odd numbered pages can be printed
 - C. A report must have a field stating the page numbers before it will print
 - D. None of the above
- 7. When using the Label Wizard, which operation, if any, is not allowed?**
- A. Make a custom label of any size
 - B. Insert a picture like a logo
 - C. Change the color, font, and style of the text
 - D. Name the set of labels for later use
- 8. Which is not a standard type of header available in a report?**
- A. Page Footer
 - B. Data Header
 - C. Report Header
 - D. Report Footer
- 9. Which method can be used to view the properties of a Report Section?**
- A. Right-click the header and click Properties
 - B. Select the header and then click the Property Sheet command
 - C. Double-click the Report Selector, then use the combo box at the top of the Property Sheet to choose the appropriate header
 - D. All of the above

10. You want to modify the properties of a grouping order. What methods are available to you?

- A. You can group and sort in alphabetical and numerical order
- B. You can apply a group total that can computer the average, maximum and total sum of a group
- C. You can apply a grouping based on the first few characters of the value in each field that is being grouped
- D. All of the above

You can modify the properties of a grouping order in many ways.

UNIT 5: Working with Queries

In this section you will learn how to:

- Create a query by hand
- Create a query with the help of the Query Wizard
- Sort and Filter query results
- Query multiple tables at one time
- Use the Expression Builder to create complex search criteria
- Create a Parameter query to get on-the-fly search criteria
- Create a table based on the results of a query
- Append, Delete, and Update data using Action Queries

5.1: Basic Queries

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.

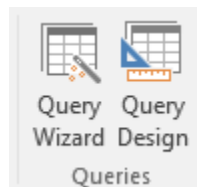
Review of Queries

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.

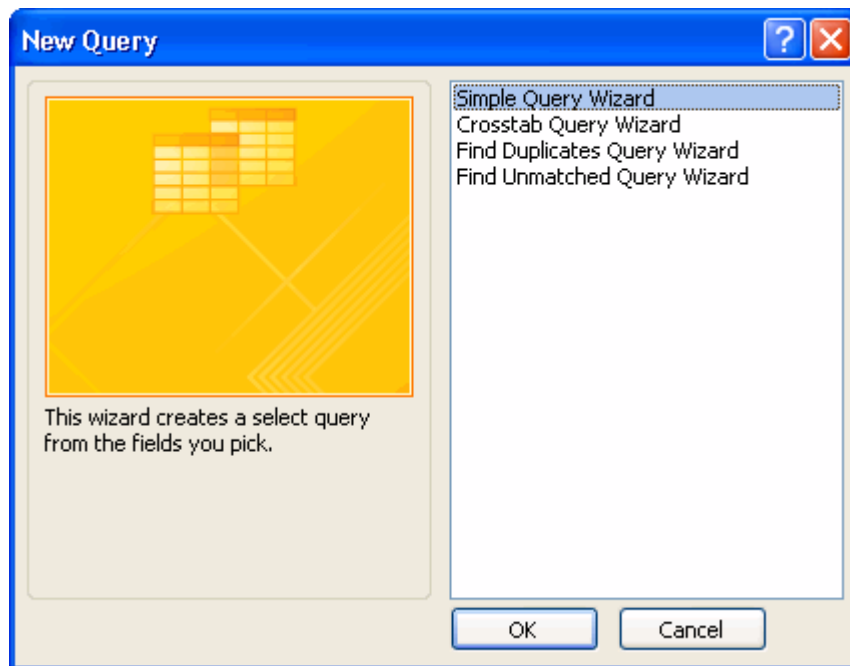
Most queries are called select queries; they search for information in your database based on criteria you specify. There is another category of query called an action query that is designed to insert new data into a new table, delete old data from a table, or append to data already in a database based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

Creating a Query

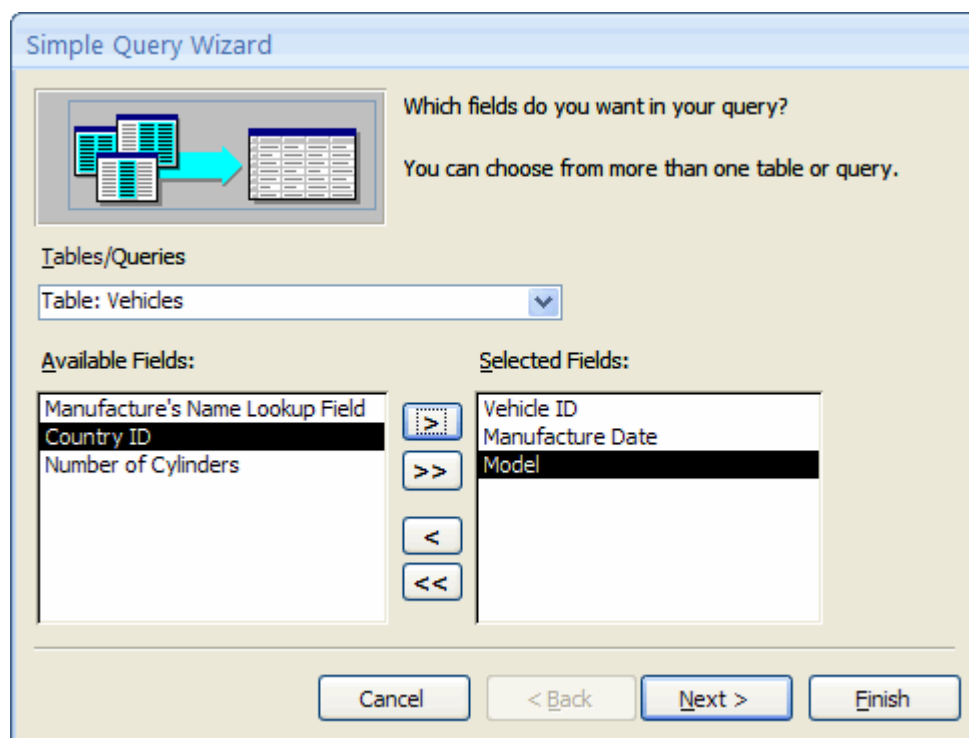
Access makes creating a query an easy task by using either the Query Wizard or Design view. In this section we will cover the basics of each method. To use the Wizard, click the Query Wizard command in the Other section of the Create ribbon:



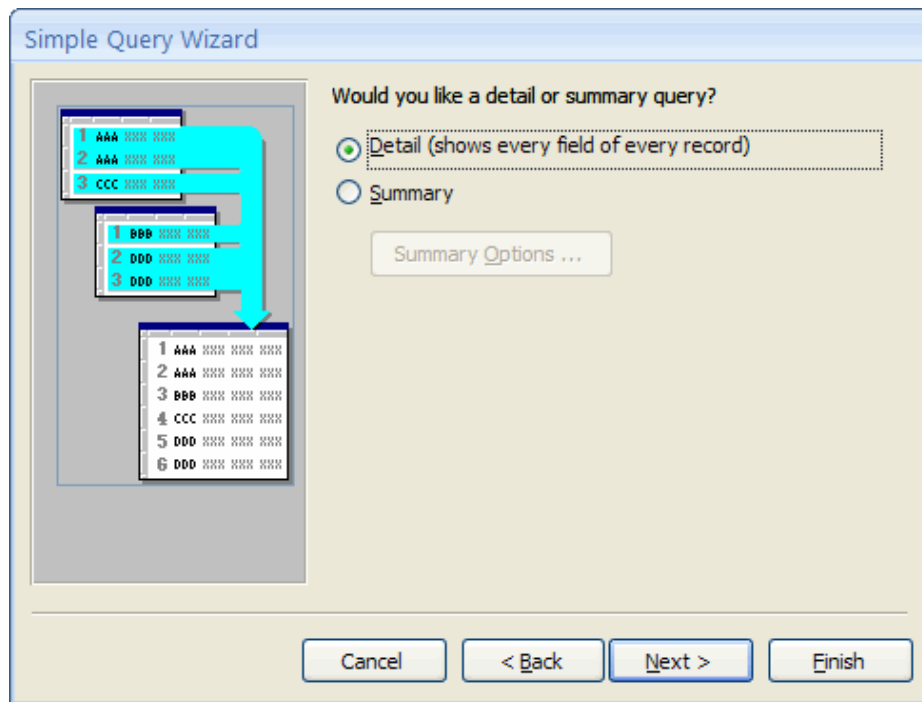
You will be prompted to choose a new type of query. In this example, we will explore the Simple Query Wizard:



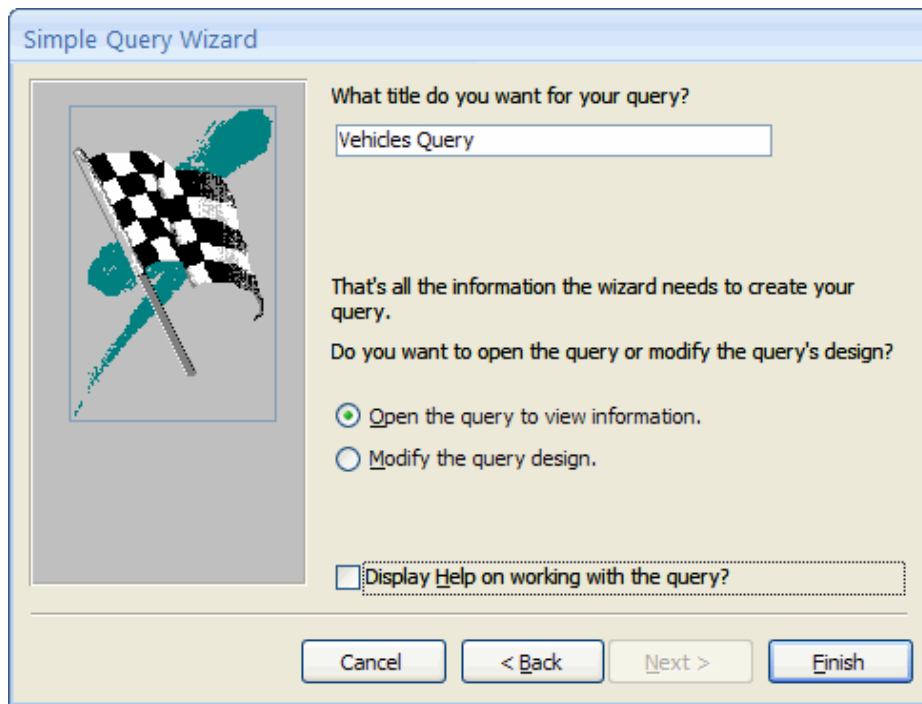
Access prompts you to select the table or query that contains the source information, choose the fields you want to show in the query (> moves a single field, >> moves all fields), and then click Next:



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:

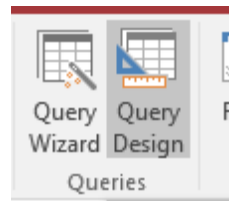


Clicking Finish will display the query results in what is essentially Datasheet view:

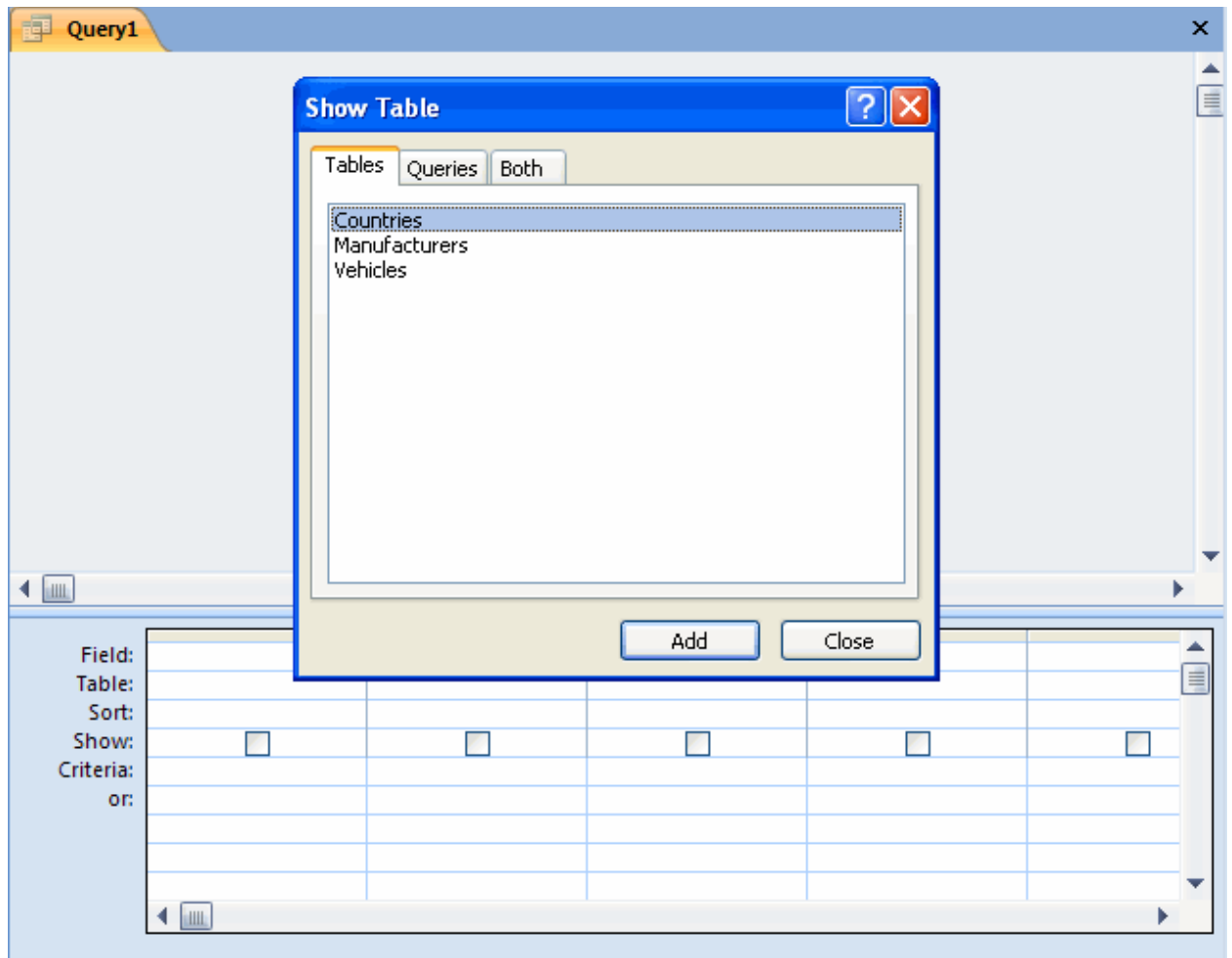
Vehicles Query		
Vehicle ID #	Manufacture Date	Model
1	1982	Corvette
2	2003	V12 Vanquish
3	2000	S2000
4	2003	Tiburon
5	2002	575 Marinello
6	1979	Spider
7	1965	Falcon
8	2005	GT
* (New)		
Record: 1 of 8		
No Filter		
Search		

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

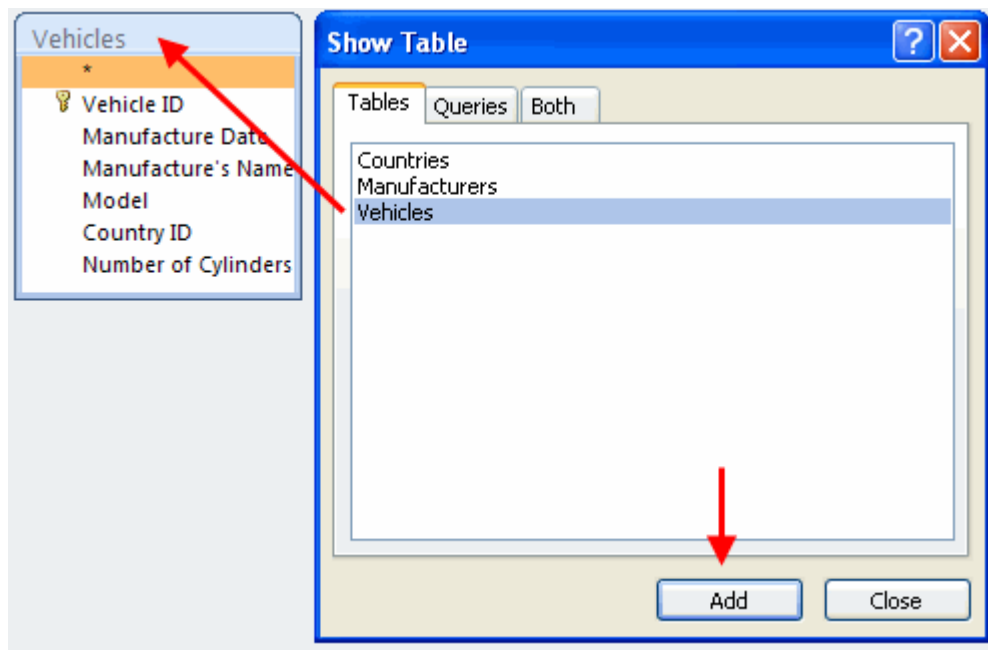
Let's create the same query using Design view. To start working with a new blank query, click the Query Design command:



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

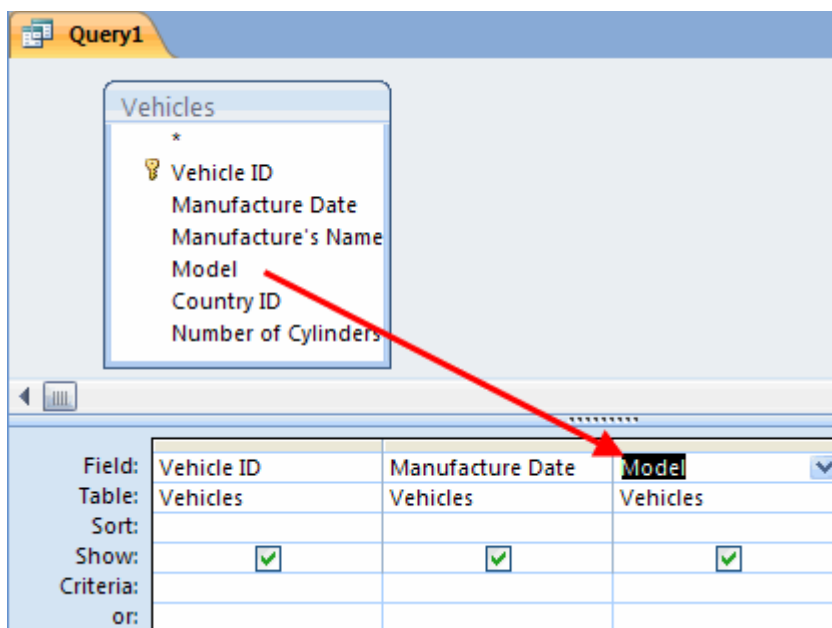


Using this box, add as many tables and/or queries as you need to get the information relevant to your query. Select each necessary object and click Add.



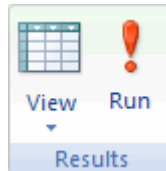
The source table will be added to the working space, with each field in the table listed. The primary key of the table contains a small key icon beside it. When you have finished adding the objects relevant to your table, click Close.

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:

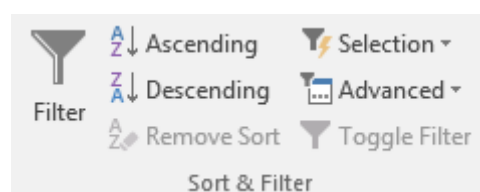
Query1		
Vehicle ID #	Manufacture Date	Model
1	1982	Corvette
2	2003	V12 Vanquish
3	2000	S2000
4	2003	Tiburon
5	2002	575 Marinello
6	1979	Spider
7	1965	Falcon
8	2005	GT
* (New)		

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

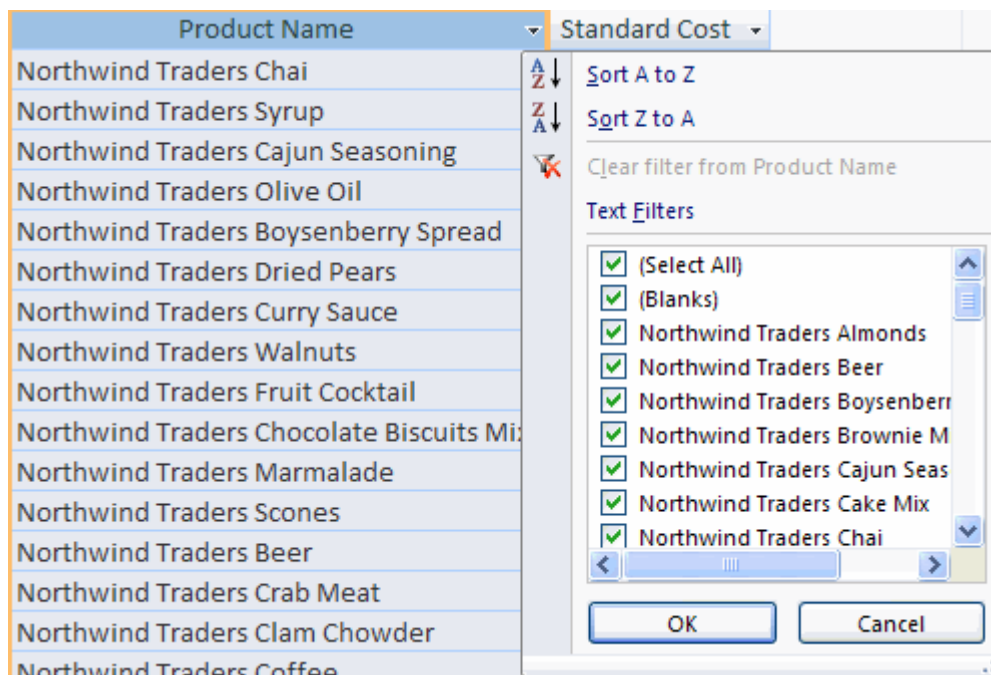
There are two ways to easily sort a query. First, select a column of data by clicking on the name of the column (such as Product Name column header). You can use the Sort & Filter section of the Home ribbon and click either the Sort Ascending or Sort Descending commands:



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).

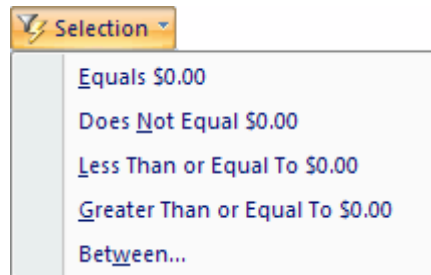
There are a few different ways to filter a query, so let's talk about each.

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

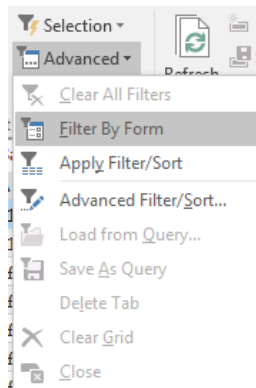
any instance of a \$0.00 price to select the cell. Click the pull-down arrow beside the Selection command ( Selection) in the Sort & Filter section:



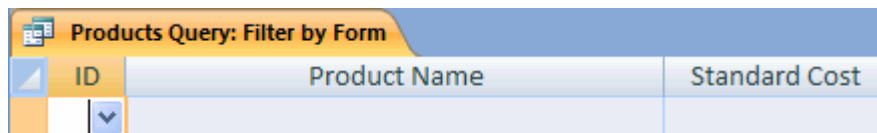
The options listed in the pull-down menu allow you to apply logical filtering to the current selection. Since we wish to find all of the items with the same price, select the first option. This will display all items meeting the search criteria:

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

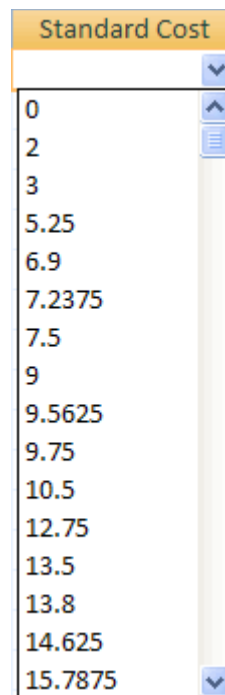
The next method of filtering is Filter by Form. Click the Filter by Form option found in the Advanced command:




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.



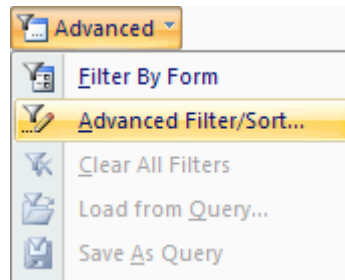
For example, click the combo box in the Standard Cost column:



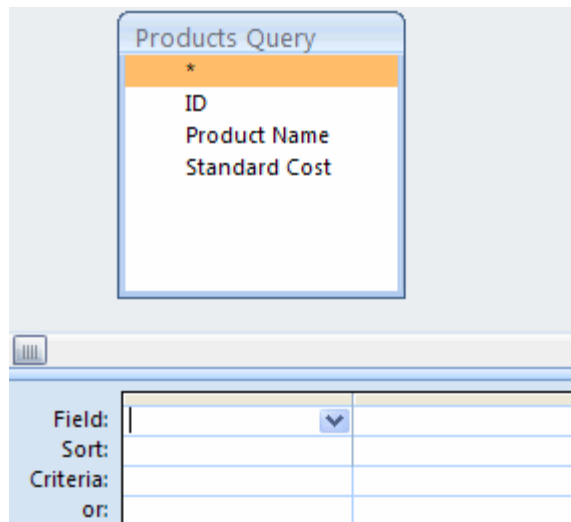
Select one of the options in the list to only display the records which have the same standard cost as the value you selected from the combo box. Pick a price from the column, such as 7.5, and then click the Toggle Filter command ( [Toggle Filter](#)) in the Sort & Filter section of the Home ribbon:

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

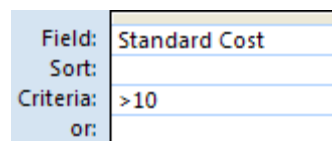
The final type of filter that Access can perform is an Advanced Filter; a manual filter using Design view. To use an advanced filter, click the Advanced Filter/Sort option in the Advanced command:



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



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:

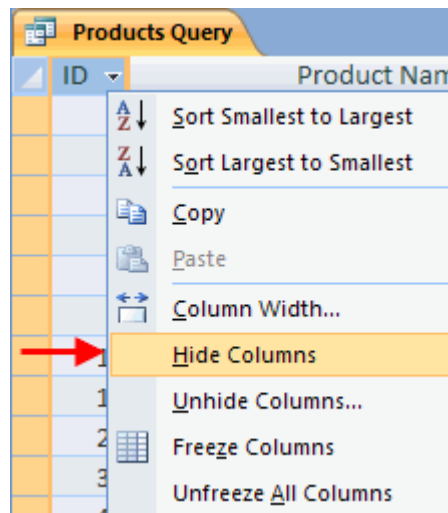


Then, click the Toggle Filter command to filter the results:

Products Query		Products QueryFilter1
ID	Product Name	Standard Cost
	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

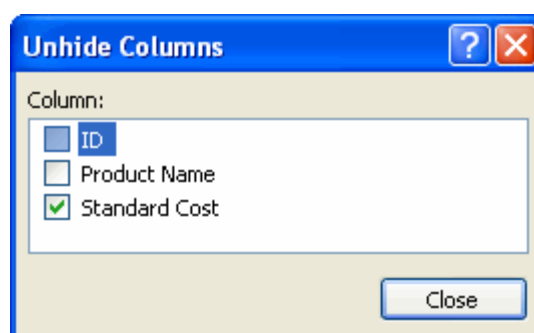
Hiding Fields

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.

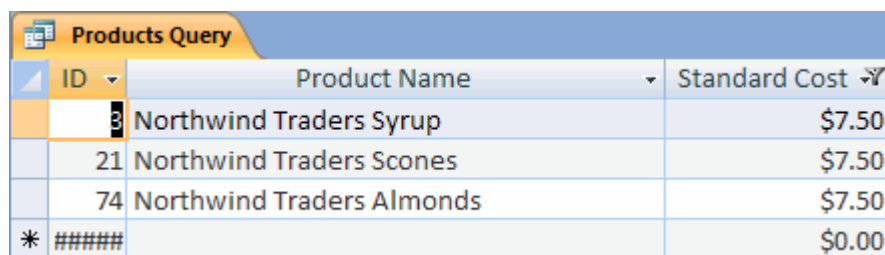
To show any hidden columns, right click the header of any column still visible and click Unhide Columns:



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.

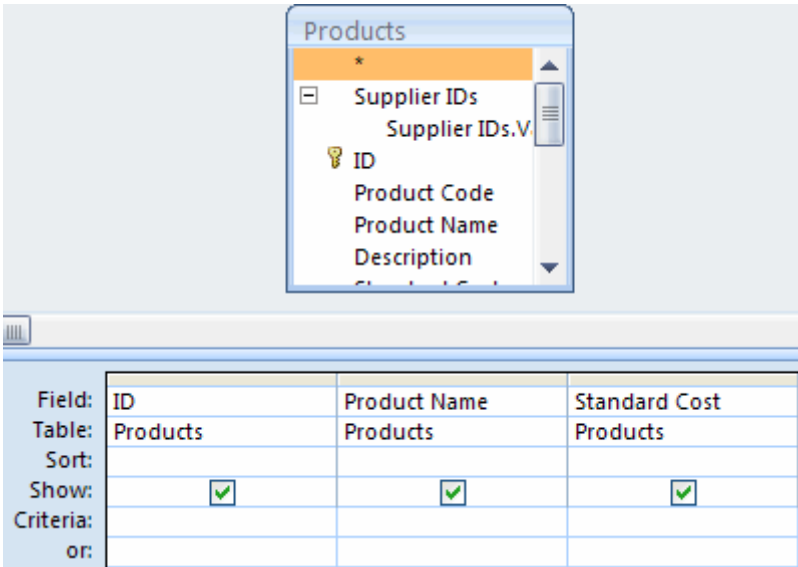
When dealing with AND and OR operations, it is important to understand how they work on a logical level. These operators require two pieces of input and produce one output, either true or false.

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.

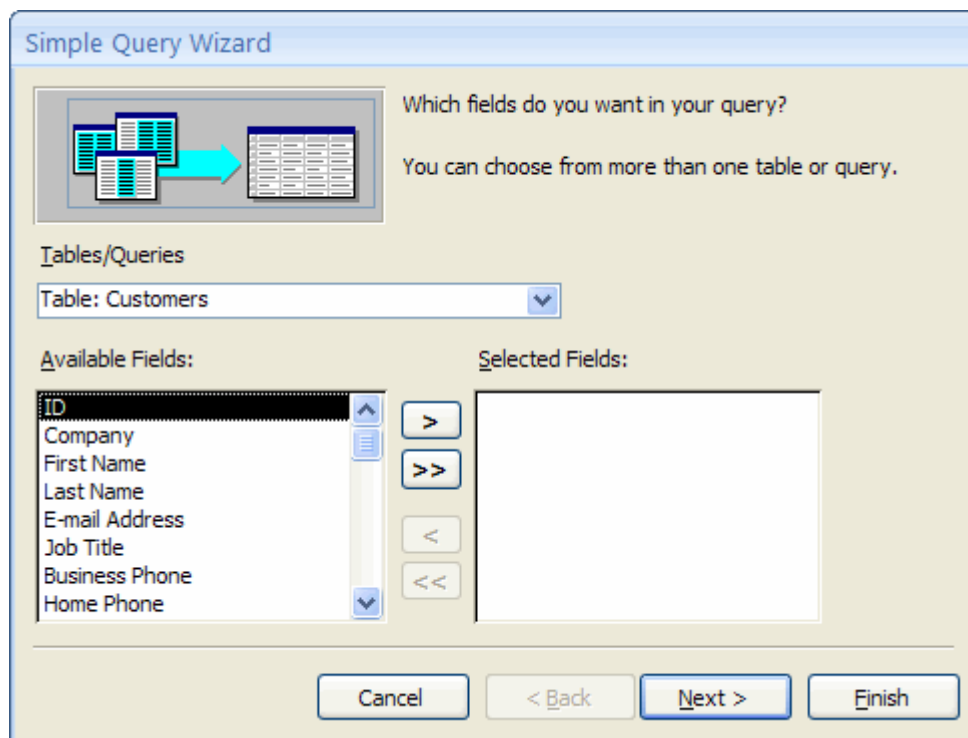
The syntax of the IIF function is IIF(expression, doThisIfTrue, doThisIfFalse). The trick with this function is that no matter which value is returned by the function, the true and false portions of the equation are always evaluated. Care should be taken when making the true and false portions of an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

5.2: 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

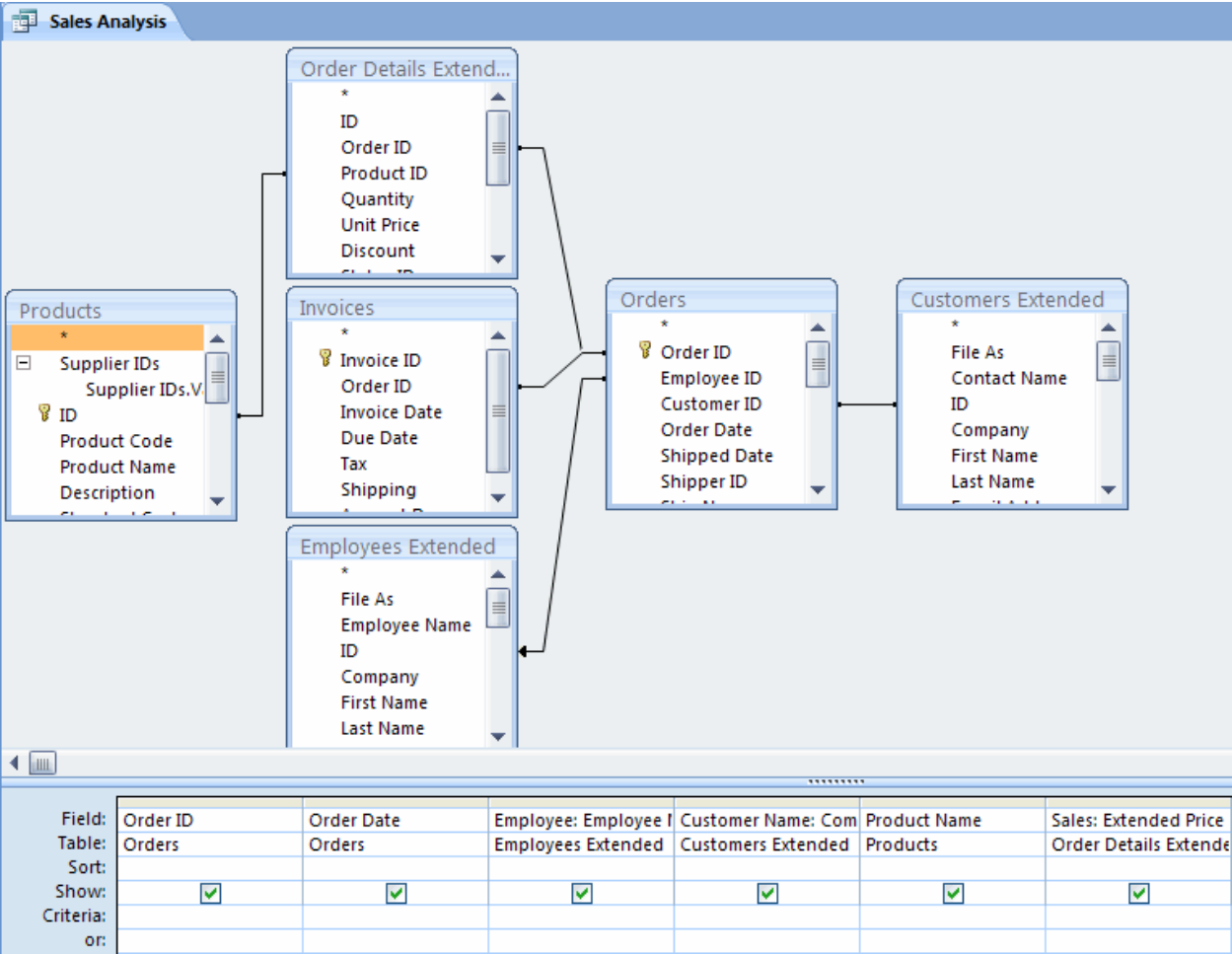
We have already seen a few multiple-table queries, including one in the last Step-By-Step exercise. The easiest way to make use of multiple table queries is to use the query Wizard:



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:

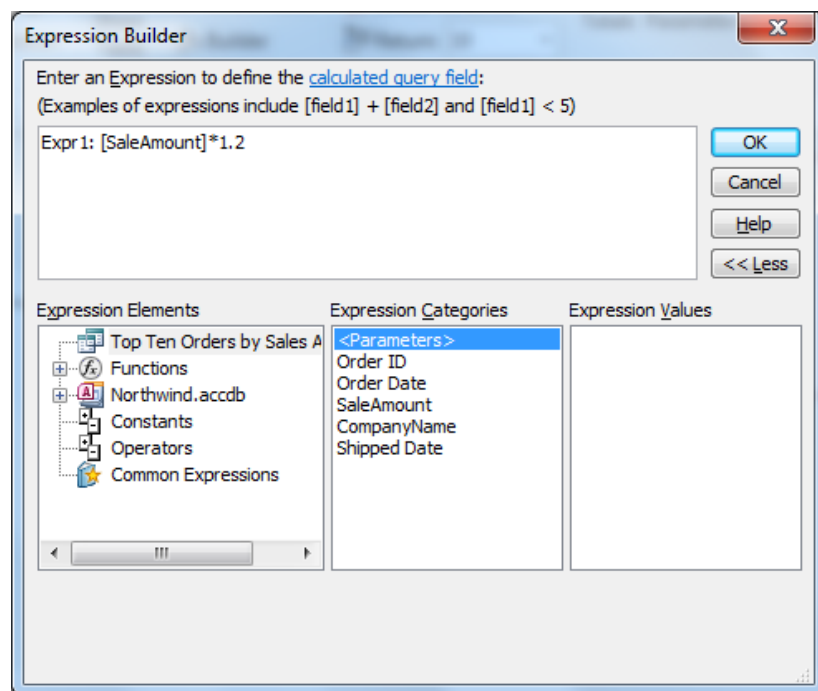
[Standard Cost]	Expr1: [Standard Cost]*1.05
Products	
<input checked="" type="checkbox"/>	<input type="checkbox"/>

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:



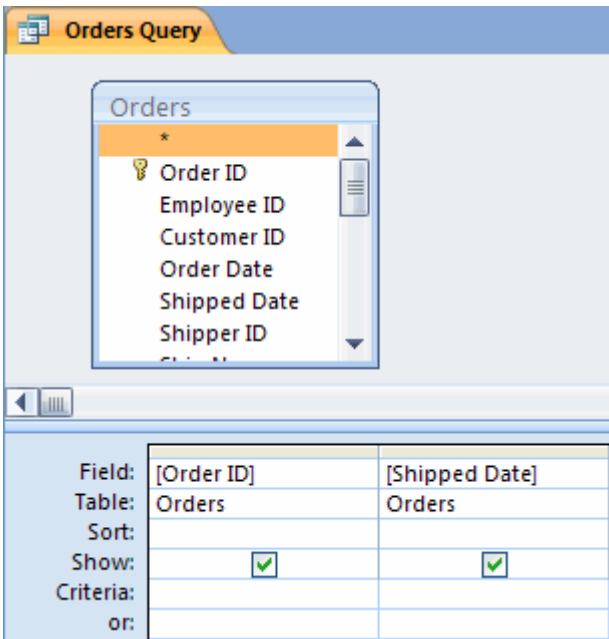
At the top of the Expression Builder dialogue box is the expression itself. This is a completely editable text box that lets you type whatever operators you wish by hand. You can use logical operators like AND, OR, NOT and LIKE, as well as use parenthesis to enclose certain parts of your expression and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

In the lower part for the Expression Builder 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

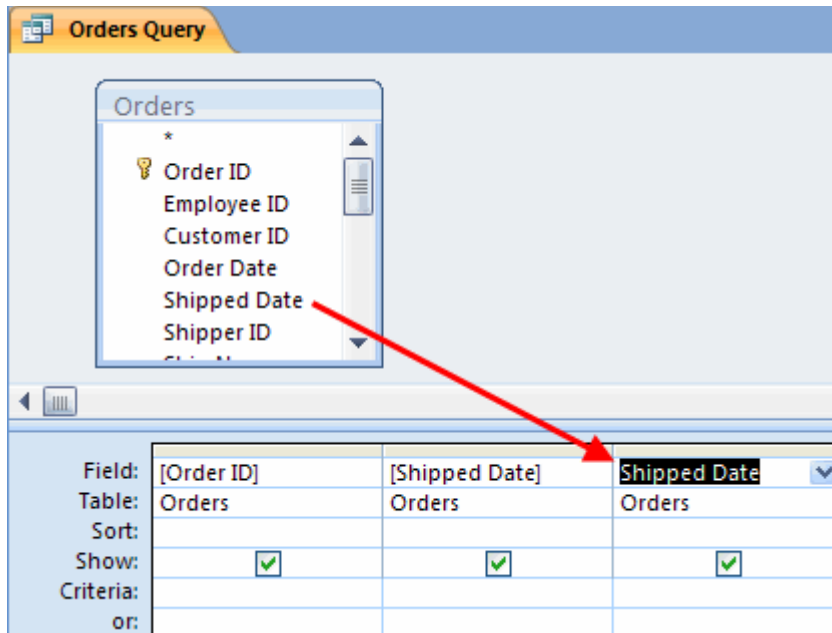
Using the topics introduced in this lesson allows us to create queries that will provide a summary of data. There is no direct “Summary Query” option that you can pick from a list; instead you build your own depending on the data you are looking for. You might want to know how many orders were placed 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:



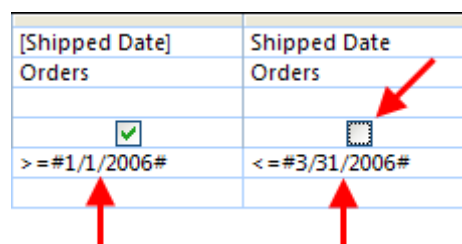
In the Northwind sample database, all of the shipping details are listed in the Orders table. Running this query as is will tell you when each order was shipped. But if we want to know what order shipped between Jan. 1, 2006 and Mar. 31, 2006 we need to do a bit of editing first. In fact, the first step 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:



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)

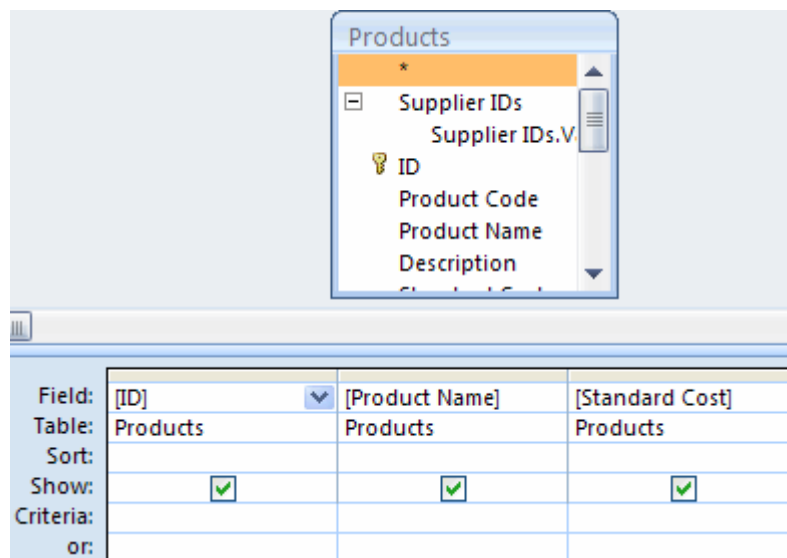
The query results show the ID and shipping date of each order, and show us that there were 11 orders shipped in the first three months of 2006.

5.3: 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.

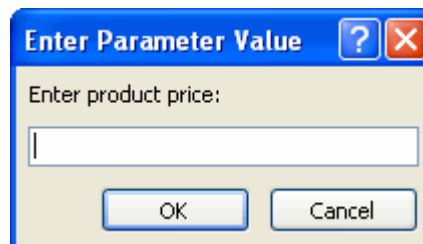
[Standard Cost]
Products
<input checked="" type="checkbox"/>
[Enter product price:]



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:



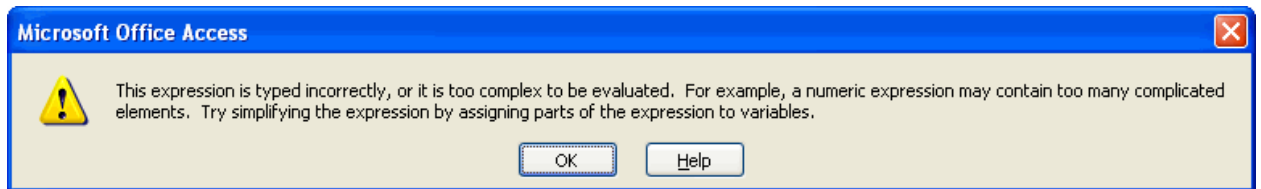
If you enter 7.50 into the text box and click OK, all products that are \$7.50 in price will be displayed:

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 product the same results so users with various levels of comfort with computers can enter information as simple

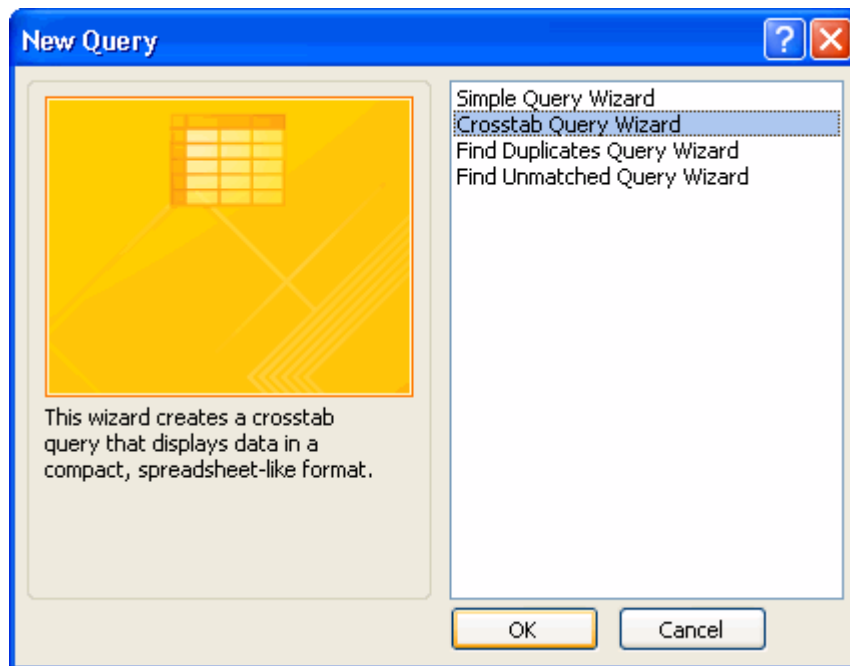
or as complex as they like. Entering a price that is not in the database, such as the value 100, will not return any rows. Entering data of an incorrect data type, such as the word 'apple', will produce a syntax error:



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:

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:

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?

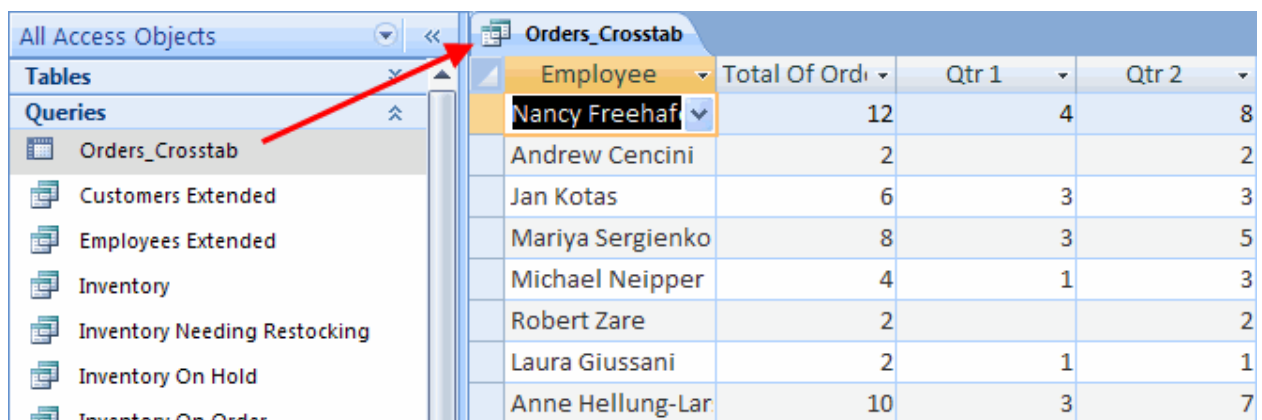
☒ View the query.

☐ Modify the design.

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

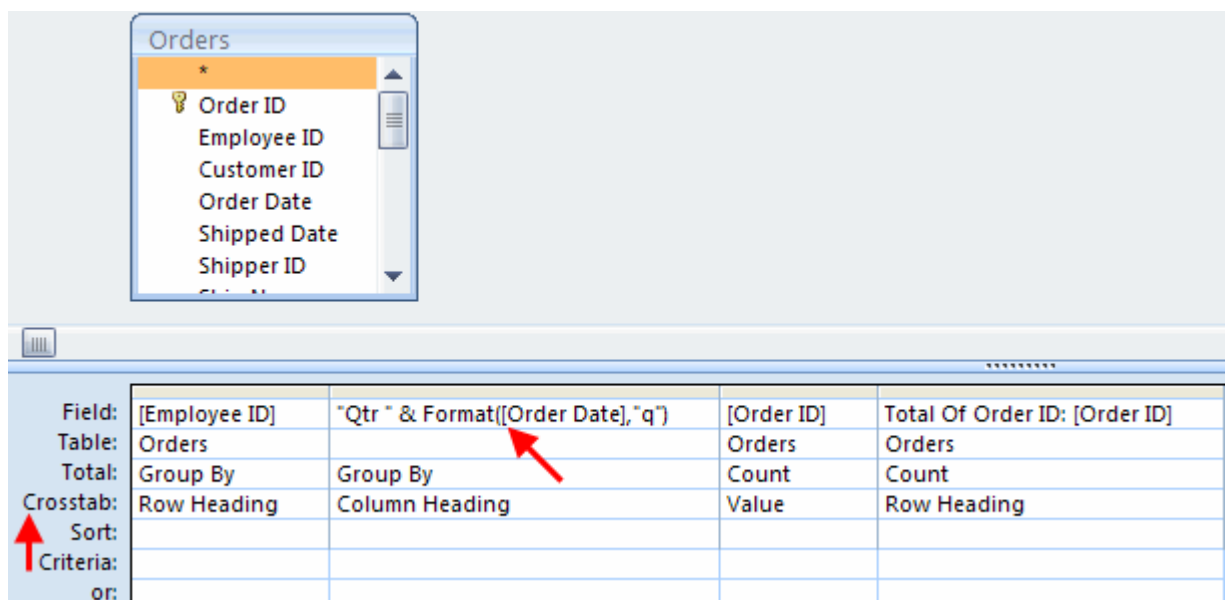
Using Crosstab Queries

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

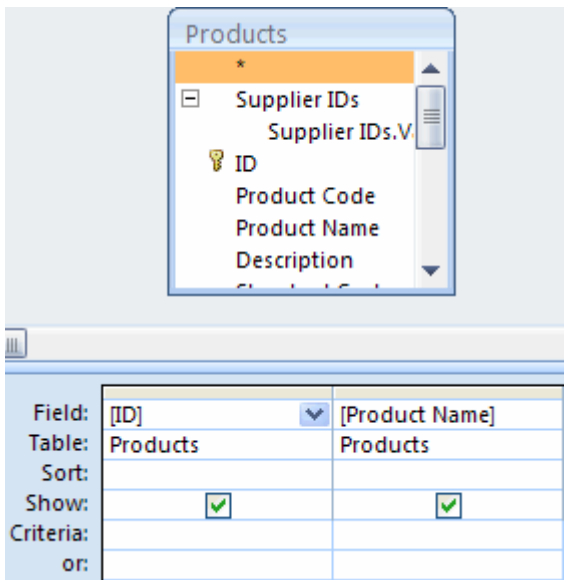
Every crosstab query features a Crosstab row that states what part each field plays in the creation of the crosstab query. A special command has been entered into the

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

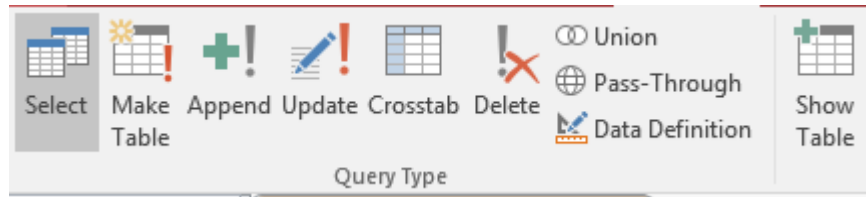
When a query returns its results to Datasheet view, what does it look like? Datasheet view of a table, of course! Technically, every time a query returns results, they are stored in a temporary table in the memory of your computer. We need only to add a step to make the query results a table in the database 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:

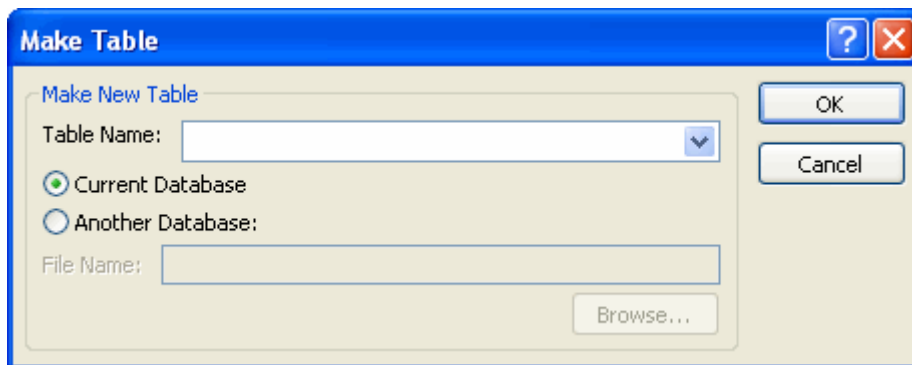


At the top of the Access window, you will see the Query Type section of the Query Tools - Design ribbon. Click the Make Table command:

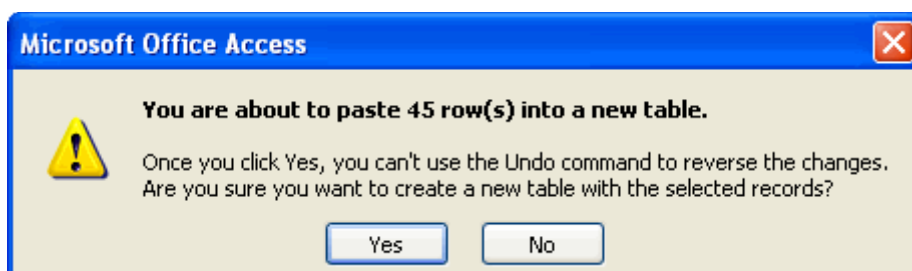




The Make Table dialogue box will appear:

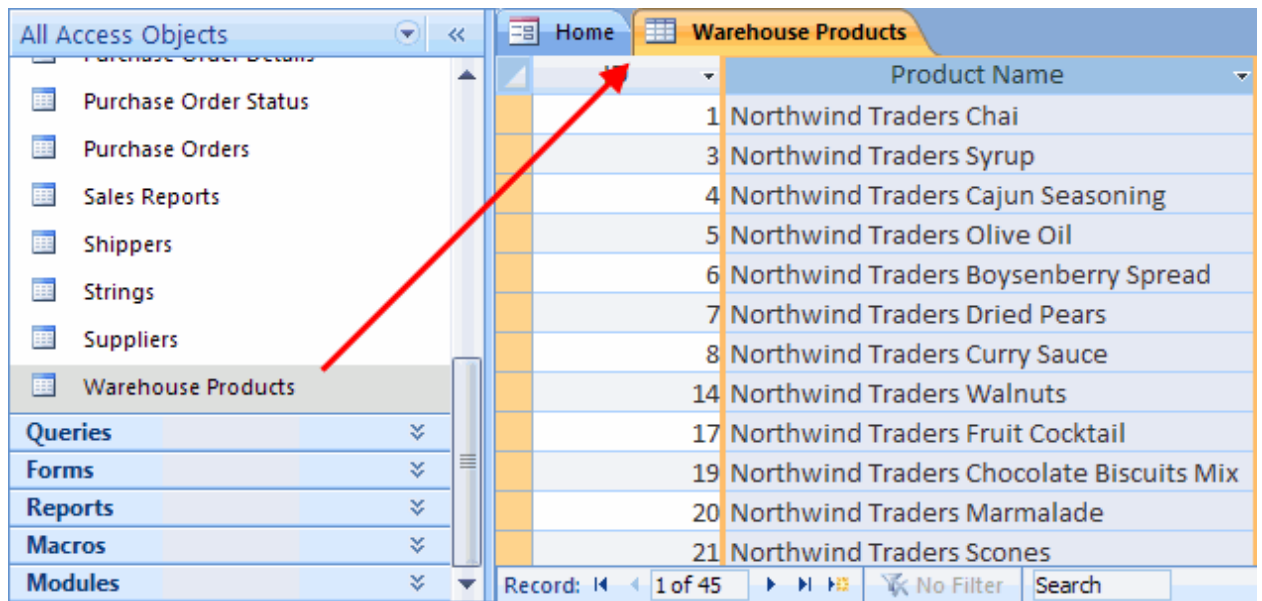


Give the table a new and meaningful name and specify where you would like it created. In order to save the table in another database, the database file must be stored on your computer (unless you have previously established the communication links necessary between your computer and another network).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



The screenshot shows the Microsoft Access interface. On the left, the 'All Access Objects' pane lists various database objects. The 'Warehouse Products' table is highlighted. A red arrow points from this object to the table view on the right. The table view shows a list of products with their IDs and names. The status bar at the bottom indicates 'Record: 1 of 45' and 'No Filter'.

	Product Name
1	Northwind Traders Chai
3	Northwind Traders Syrup
4	Northwind Traders Cajun Seasoning
5	Northwind Traders Olive Oil
6	Northwind Traders Boysenberry Spread
7	Northwind Traders Dried Pears
8	Northwind Traders Curry Sauce
14	Northwind Traders Walnuts
17	Northwind Traders Fruit Cocktail
19	Northwind Traders Chocolate Biscuits Mix
20	Northwind Traders Marmalade
21	Northwind Traders Scones

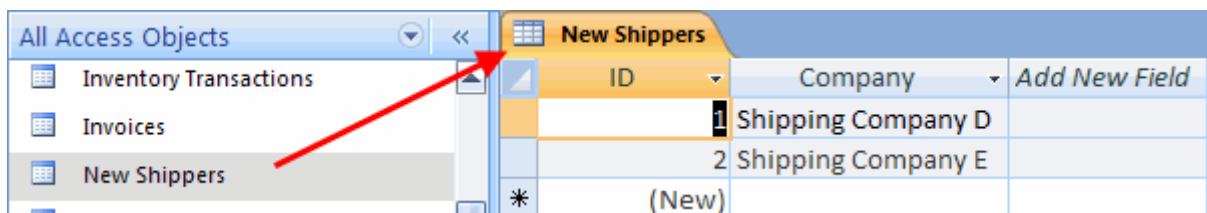
5.4: Management (Action) Queries

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:



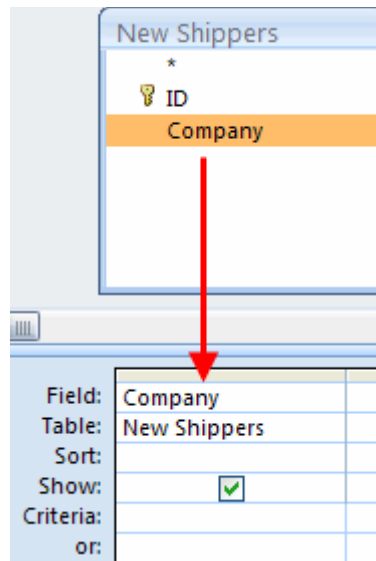
ID	Company	Add New Field
1	Shipping Company D	
2	Shipping Company E	
*(New)		

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.

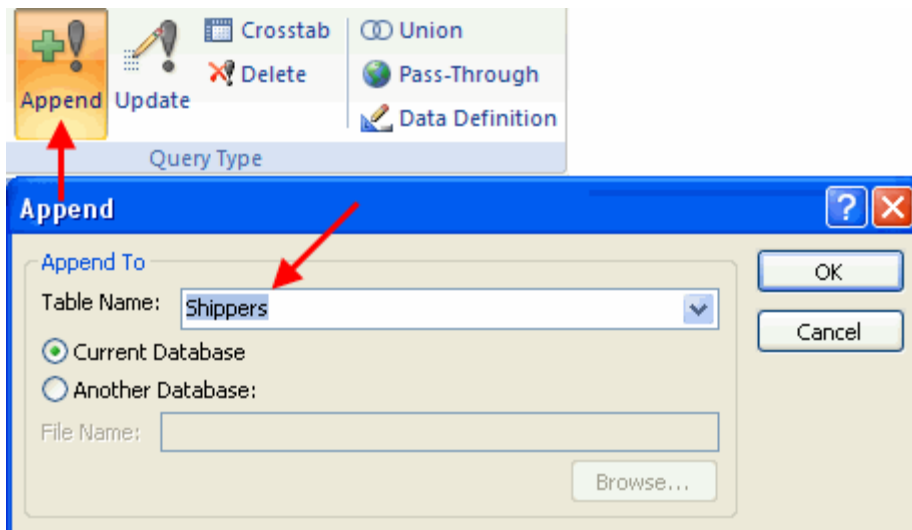
Before we proceed with this lesson, it is important to note that both the New Shippers table and the (old) Shippers table have the same design and data types. Both tables have ID as an AutoNumber primary key, and some of the key values are duplicates. Since we cannot have duplicate primary keys, do not 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:



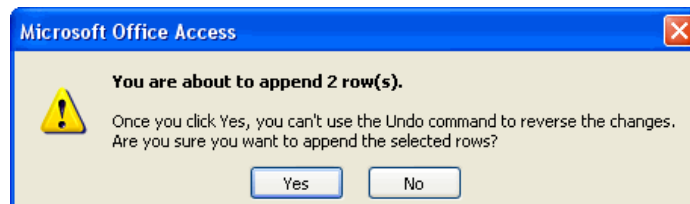
Click the Append command in the Query Type section of the Query Tools - Design ribbon. When the Append dialogue box appears, choose Shippers from the Table Name combo box:



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

Field:	Company
Table:	New Shippers
Sort:	
Append To:	Company
Criteria:	
or:	

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:

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

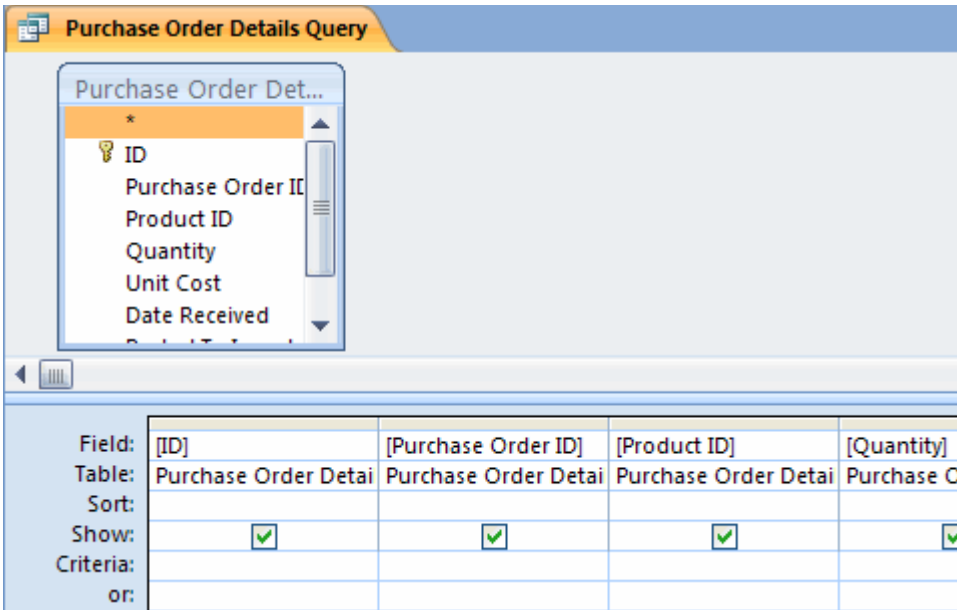
Delete Queries

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.

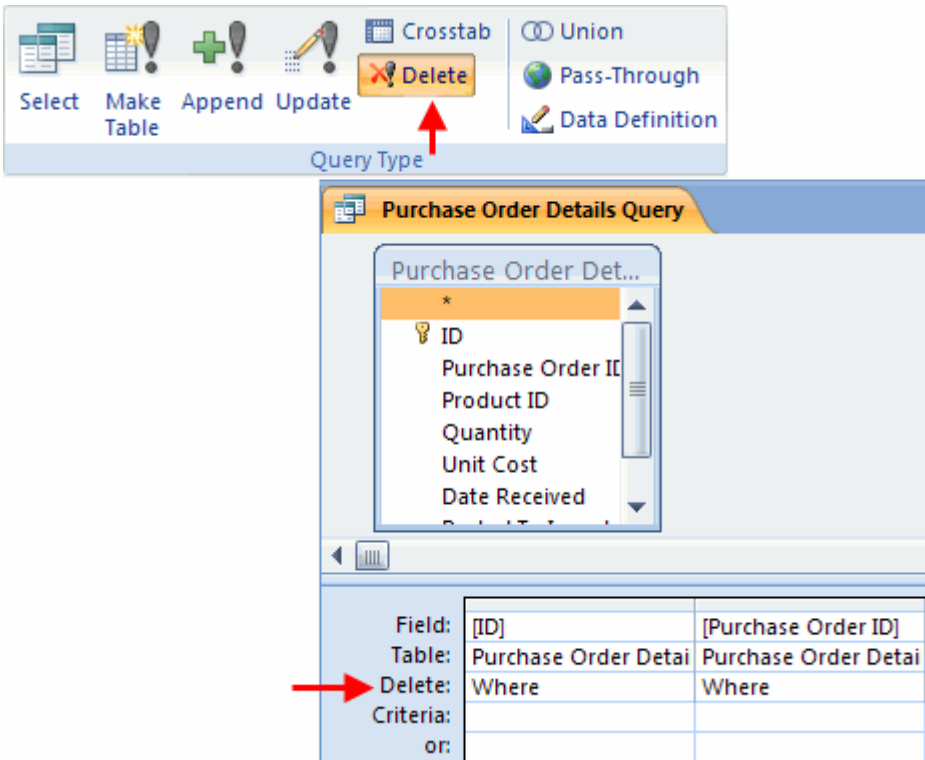
For example, imagine you want to remove all purchase order data from the month of January from the Northwind sample database. If we want to perform the deletion of old records, it is necessary in Access to create a query containing all fields from the source table. The easiest way to do this is to use 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:

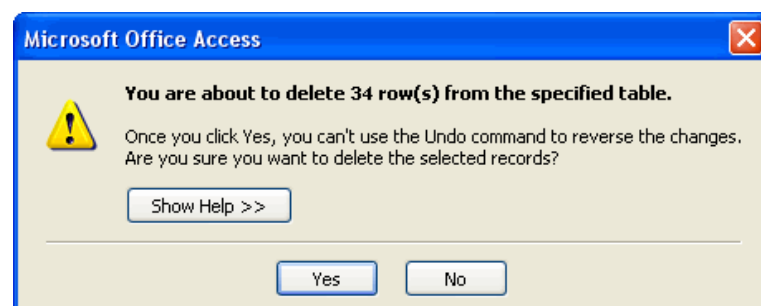


The Delete row contains two options, Where and From. The Where option (called a where clause) means "delete the current field from this table based on the criteria I enter." The From clause is only usable when you are constructing a Delete query based on the information from two or more tables. The From 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 Detai
Where
<#2/1/2006#

Click the Run button to execute the query:



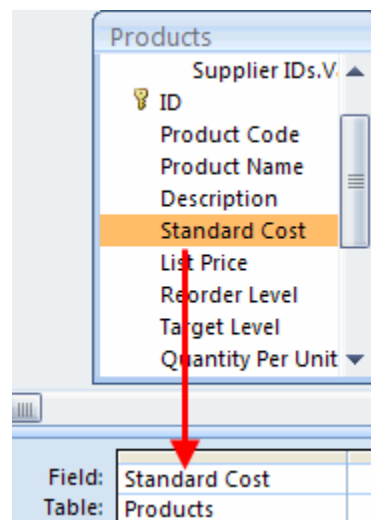
Access confirms that you are about to permanently delete information from a table; click Yes to confirm.

Update Queries

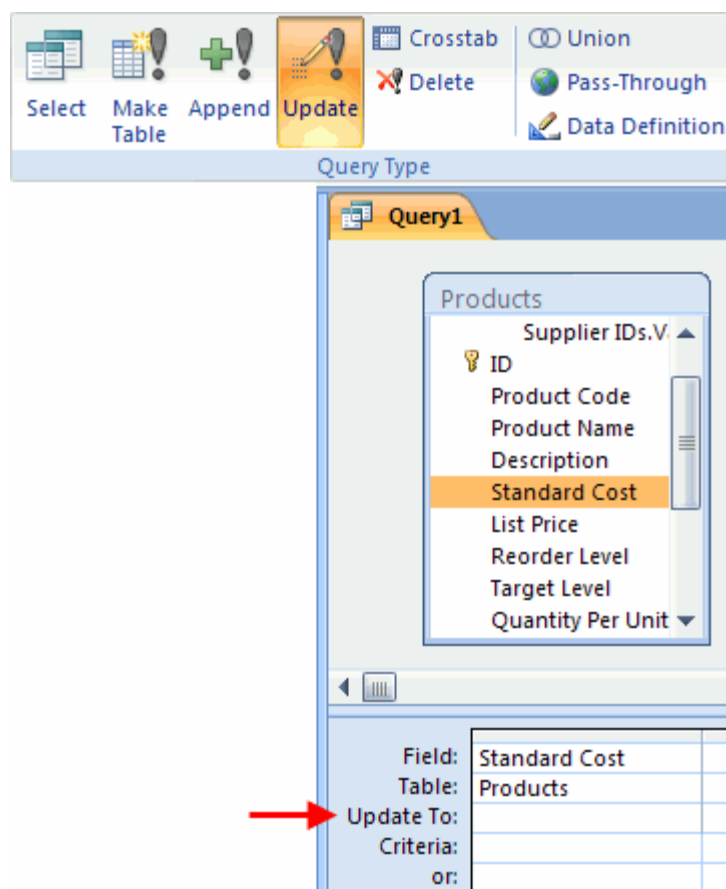
If you recall the calculated field from earlier in this manual, you know that you can enter some expression into a field of a query thusly creating a new field and a calculated value. An update query is similar in design, but instead of making a whole new column of calculated data, the query will perform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

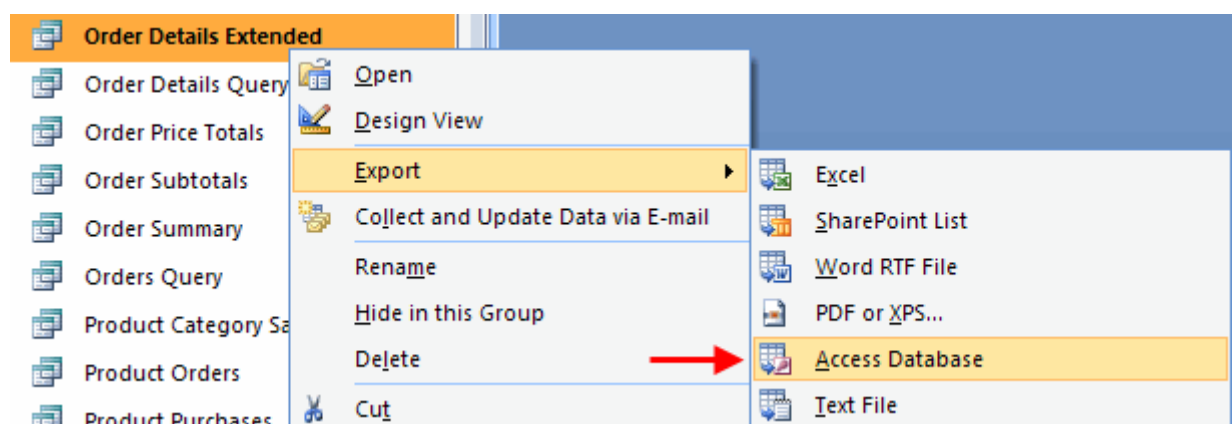
Standard Cost
\$14.18
\$7.88
\$17.33
\$16.81
\$19.69
\$23.63
\$31.50
\$18.31

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

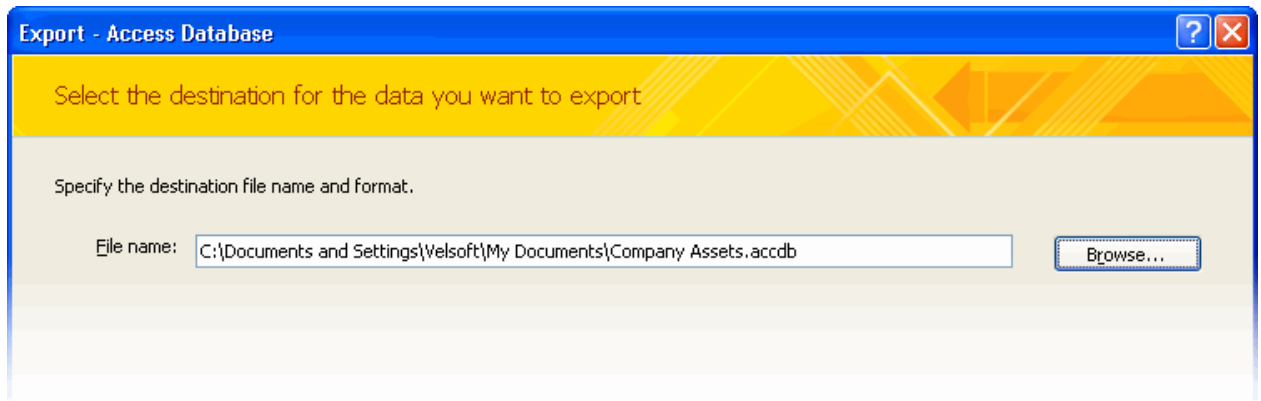
Exporting Queries

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).

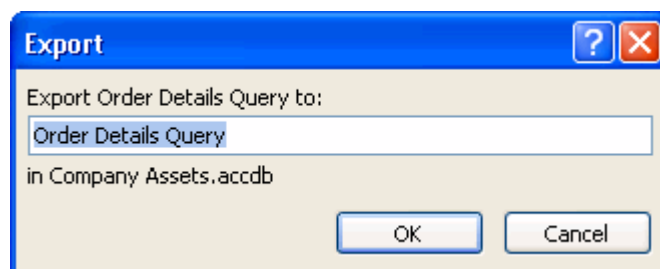
Simply right-click the query (or object) you want to export in the Navigation Pane, point to Export, and then click Access Database:



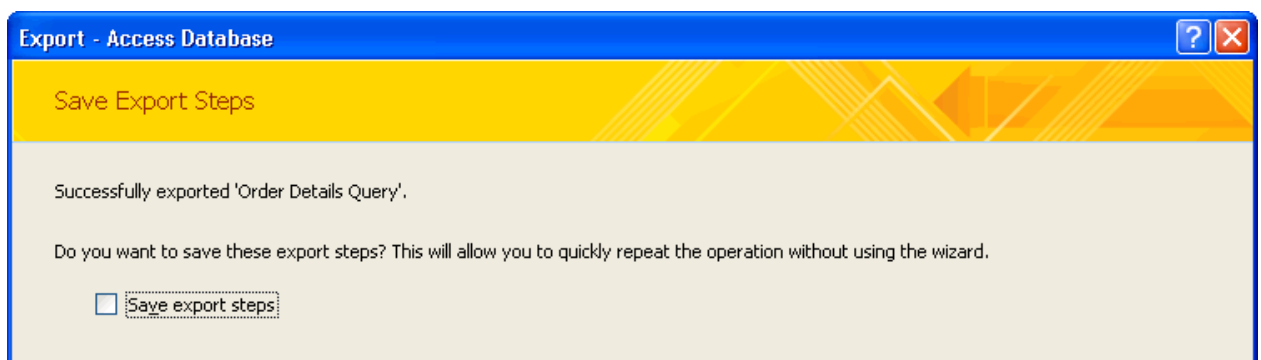
Access will ask you where you would like to export the file. You can export to a local file on your machine or on a remote database. Locate the destination file for your object and then click OK:



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.




Unit 5: Review Questions

1. **When adding fields to a list, the (>>) button**
 - A. Skips to the next table
 - B. Adds all fields in the current table
 - C. Fast-forwards any music you are playing
 - D. None of the above

2. **How many tables can you add to the Design view of a query?**
 - A. As many as you like
 - B. Only tables that have been created since you opened the database
 - C. A maximum of six
 - D. Only one

3. **A calculated field...**
 - A. Adds a new primary key
 - B. Appends data to an existing field
 - C. Calculates how many times the database has been opened
 - D. Calculates a new column of data based on current data

4. **What does the following command do?** 
 - A. Deletes everything!
 - B. Runs a form
 - C. Executes a query
 - D. None of the above

5. **Make-Table queries...**
 - A. Create a new table based on report results
 - B. Create a new table based on query results
 - C. Create a new table in a blank database
 - D. Perform all three functions

6. **Access lets you export _____ to another database...**
 - A. Queries
 - B. Tables
 - C. Reports
 - D. All of the above

- 7. Which is not a valid method of sorting?**
- A. Sort ascending
 - B. Sort by Selection
 - C. Sort descending
 - D. Both A and C
- 8. When Filtering by Form, click the _____ tab to add another clause**
- A. AND
 - B. OR
 - C. NOT
 - D. None of the above
- 9. Which of the following is not an action query in Access?**
- A. Delete
 - B. Update
 - C. Append
 - D. Revert
- 10. Which of the following is true regarding parameter queries?**
- A. You can apply a parameter search to as many fields as you like
 - B. You can apply a parameter search to only one field
 - C. You can apply a parameter search to as many fields as there are tables included in a query
 - D. All of the above

Index

AND Operations	192, 201, 202
AutoNumber	52, 88, 89, 216
Database	
Compacting	1
Compressing	21
Linking	31
Properties	4
Repairing	2
Excel Spreadsheet	
Linking to	27
Exporting	
Queries	222
Saving steps	18
To CAB	20
To Microsoft Word	12
To older Access formats	23
To RTF	15
Expression Builder	74, 112, 113, 155, 174, 200
Format Painter	121, 139, 157
Forms	
Adding controls	94
Adding logo to	121
Aligning controls	126
And gridlines	117
Arrange ribbon	118, 126, 136
AutoFormat	132
Calculated controls	113
Control overview	95
Control properties	107, 125
Control wizard	100
Control's default value	112
Design ribbon	106, 109, 118, 121, 124, 129, 131
Editing controls in	101
Formatting controls	106, 124
Formatting ribbon	134
Modifying a control's data source	110
Properties	116
Special effects	130
Types of	91
What are?	91
Hyperlinks	37, 38
IIF Operations	195
Input Mask	61, 62, 72

Label Wizard	165, 167, 170, 172
My Computer Dialogue.....	39
Object Dependencies.....	56, 57
Object Linking and Embedding	<i>See External Data</i>
OLE.....	<i>See External Data</i>
OR operations	192
PDF.....	9, 11, 12, 40, 99
Queries	
Advanced filtering.....	188
And calculated fields.....	198
Append	216
Creating basic	175
Crosstab.....	206, 211, 212
Delete.....	218
Design view	180
Executing	182
Exporting.....	<i>See External Data</i>
Filtering by Form.....	186
Filtering by Selection	185
Hiding fields	191
Make table.....	213
Multiple table	196
Parameter	204, 205
Showing fields.....	191
Sorting.....	183
Summary.....	201
Update	220
What are?	175
Reports	
Adding fields	142
Adding logos	157
And gridlines	155
Arrange ribbon.....	156, 164
Calculated controls in	154
Design ribbon.....	142, 148, 154, 157, 161
Field list.....	144
Grouping and sorting data.....	148, 152
Headers and footers	165
Inserting photo	161
Layout tips	158
Page numbers	165
Page Setup ribbon	162
Removing fields	142
Section Properties	147
Sections.....	1, 8, 71, 139, 140, 145
Ribbons	
Create	91, 93, 141, 166, 175

Database Tools	56, 65
External Data	15, 17, 24, 27, 31, 34, 36, 50
Home	30, 94, 106, 131, 157, 183, 188
Saving	
As other file types.....	18
AutoRecover	10
Exports	18
Object chart	6
Save As dialogue	5
Save As menu.....	7
SharePoint Services	34, 35, 139
Linking to	34
What is?	34
Tables	
And indexes	45
And number fields	52
And text fields.....	54
Caption field.....	57
Changing field data types	56
Default value.....	53, 54, 58, 73, 109, 118, 137
Deleting rows.....	48
Field descriptions.....	55
Field properties.....	43
Formatting	52
Importing	50
Inserting rows	47
Lookup field	75, 76, 77, 78, 79, 82, 83, 84, 87
Moving fields	49
Primary key	41, 43, 44, 46, 67, 71, 78, 88, 89, 137, 181, 216, 224
Relationships	64
Required value	59
Validation Rules	73
XPS	9, 11, 12, 40

