Snippet® Computer Training

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2016

Computer Training

Access

Level 2

Learn

Snippet® Training

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(408) 750-4542

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INTRODUCTION

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Table of Contents

Access 2016 Level 2 – Introduction

Welcome to PCM Courseware! PCM Courseware is a distinctive, flexible system for an instructor-led environment that facilitates learning via auditory, visual and hands-on experiences by each student. The manual is broken down into several lessons with each lesson subdivided into several sections. Each section covers a particular skill or concept related to the main lesson topic. In each section you will find:

1. A brief introduction to the section topic.
2. Step-by-step "how to" instructions.
3. A hands-on "Let's Try It" exercise which students perform with the instructor.
4. An independent "On Your Own" activity at the end of each lesson to identify any problem areas and to ensure that learning has taken place.
5. A chapter summary at the end of the lesson, reviewing major concepts and topics discussed in the chapter.
6. Chapter quiz to ensure that learning has taken place.

Rather than having to sift through blocks of paragraphs of written text, the introductions are brief and easy to understand, illustrated with diagrams, lists, tables and screen shots to aid in comprehension and retention. The step-by-step format of the manual enables for quick scanning by the instructor during teaching time and the ability to pull out the main points quickly without having to filter the desired information from chucks of text.

Course Requirements

It is assumed that the student has a fundamental understanding of the Windows operating system and how to maneuver with a mouse. Students should be familiar with the concepts taught in the Access 2016 Level 1 course.

A full installation of Microsoft Access 2016 should be available on each desktop, with a fresh installation strongly encouraged.

Components of the Manual

The Access 2016 manual consists of the following components:

A Table of Contents	To allow the students to quickly find desired concepts
Introduction	Discussion of manual components, course requirements, courseware philosophy and training lab set.
Lessons	The lessons are the manual chapters, each of which is composed of several sections relating to the lesson topic or skill.
Sections	Each section begins with a brief introduction to the section topic and is followed by step-by-step instructions on how the student is to accomplish a particular task. The students then perform the task with the instructor in a "*Let's Do It!*" exercise. Each step in the **Let's Do It** exercise provides the How (step-by-step) and Why (the reason for performing the step) of each phase necessary to accomplish the task.
Lesson Summary	The sections concepts are summarized in sequential order in the Lesson Summary section, allowing for quick review.
Labs	Each section concludes with an independent "**On Your Own"** exercise called a Lab. The Lab gives the opportunity for the student to practice what he/she has learned and to discover any problem areas with the topic in the section. Each lab covers the skills taught in that particular lesson (chapter).
Chapter Summary	Each section concludes with a "**Chapter Summary**" which briefly reviews all of the topics discussed in the section.
Chapter Quiz	Each section concludes with an independent "**Chapter Quiz**" to test the level of learning that has taken place. The quiz is in multiple choice and short answer format and can be done in class together or as an end of chapter test.
Class Project	The course concludes with an independent "**Class Project**" to test the level of learning that has taken place. In this project, the student utilizes skills learned throughout the class.
Index	Allows students to quickly find desired concepts.

Training Files

Each PCM Courseware course comes with a set of Lesson Files and Lab Files designed to employ real-world situations and examples. The Lesson Files are designed to be used in the *Let's Do It* exercises that the students perform with the instructor. The Lab Files are to be used for the *On Your Own* exercises at the end of each Lesson. Both the lesson files and lab files should be stored in the folder named: **Lesson Files** on each student's desktop.

What's New in Access 2016?

What's New	Description of Feature
App-Based Focus	You can create an app in Access, upload it to SharePoint where it can then be accessed by anyone you like.
AutoComplete Control	Entering data accurately is much easier and less error prone with the new AutoComplete control provides drop-down lists and recommendations when you begin typing that makes entering data easier and more accurate.
Cloud Hosting	You can store your data on the cloud if you have SharePoint on 365.
Skydrive	Allows you to save your database files to your Microsoft cloud account.
SQL Backend	Saving a database to SharePoint will create a full SQL Server to store the data.
Templates	Access 2016 includes a set of new and professionally designed templates.
Touch Mode	New touch view suited especially for tablets and smartphones.
User Interface	A simpler, easier to use design.

Lesson 1

Lesson 1 - Database Relationships

Lesson Topics:

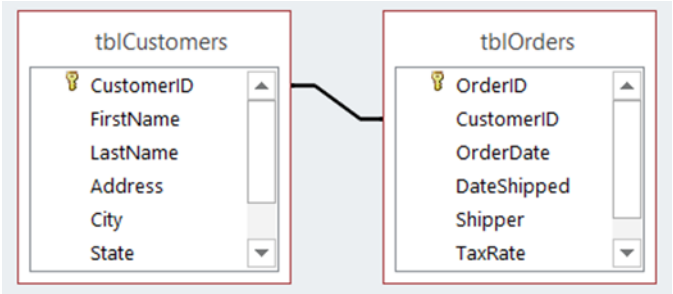
1.1 A Look at Relationships

In lesson, you will learn about database relationships.

The power of a relational database lies in its ability to relate records from one table to records in another table. You relate records between two tables by creating a **Relationship**. A relationship is a way of formally defining how two tables are related to each other by telling the database on which fields they are joined. Relationships allow you to bring data together from the related tables. A relationship works by matching data in **key fields** – usually, a field with the same name in both tables. These matching key fields consist of the **primary key** from the parent table (which provides that each record's value in that table must be unique) and the **foreign key** in the child table.

In the example below, we have a customers table and an orders table. The two tables are joined on the CustomerID field. The CustomerID field in the customers table is set as the primary key, which is joined to the CustomerID field in the Orders table (the foreign key). Now, records for a customer with a particular CustomerID number will be related to any records in the order table where the CustomerID number is the same.

Imagine we had a customer named Jane Smith whose CustomerID was 45. When entering any orders for Jane Smith in the orders table, Jane would be identified by her CustomerID number. We can then bring the data together, such as in a query. We might want to view a customer's order information. To see this, we would use data from the customers and orders table.



Database relationships fall into one of the three following categories:

- ***One-to-one***. Each record has only one related record in the second table.
- ***One-to-many***. Each record has one or more related records in the second table.
- **Many-to-many**. Each record in one table may have many related records in the second table, and those related records may in turn have related records in the first table.

We will examine each relationship type in subsequent lessons.

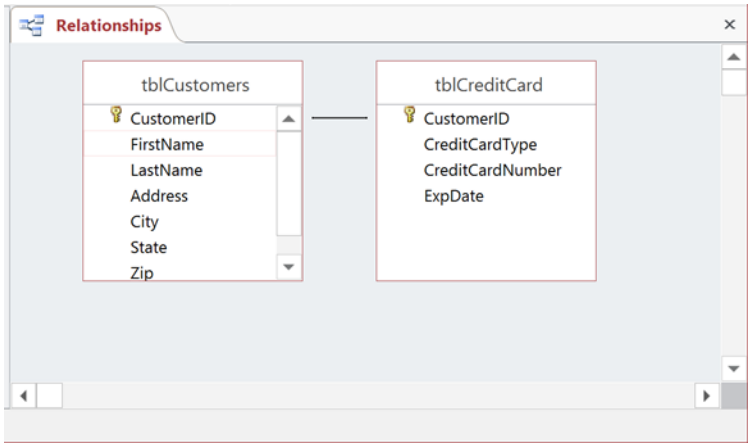
1.2 Creating a One-to-One Relationship

In lesson, you will learn how to create a one-to-one relationship.

A **One-to-One Relationship** is a relationship where each record in the first table has one – and only one – related record in the second table. This is not a very common type of relationship but does exist nonetheless. For example, we may have an employees table that is accessible by many people. We may not wish to have employee salary information easily available so we place it in a separate table with the Employee ID and Salary fields. We then create a one-to-one relationship between the two tables. By setting the EmployeeID field as a **primary key** in both tables, we have thus created a one-to-one relationship. Remember, a field that is designated as a primary key field will not allow any duplicates in that field.

Relationships are created in the **Relationships Window**. To display the Relationships Window, click the Database Tools tab on the Ribbon and then click the **Relationships button** on the Ribbon.

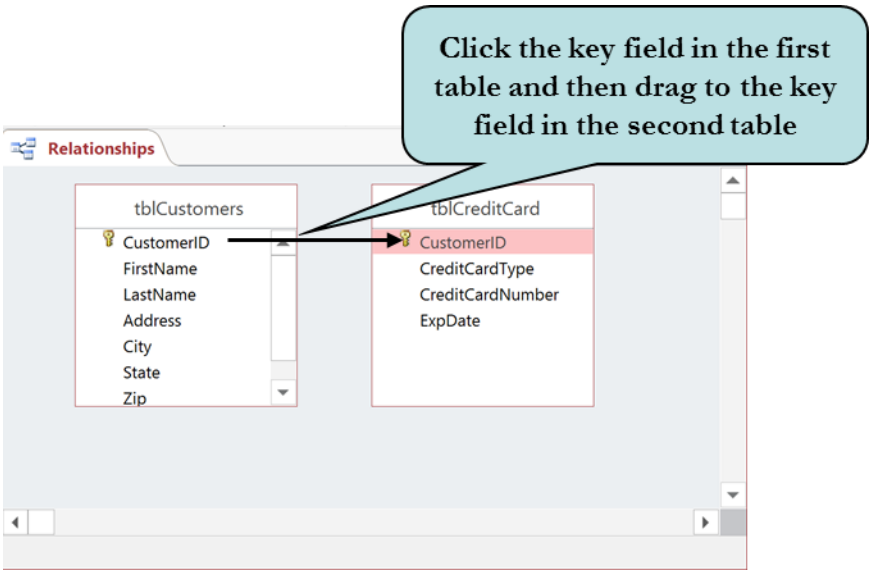
In the example below, we have a customers table and a credit card table. For security reasons, we have decided to create a separate table to hold a customer's default credit card information. As each customer will have only one default credit card on file, we create a one-to-one relationship.



To Create a One-to-One Relationship

1. Click the **Database Tools** tab on the Ribbon.
2. Click the **Relationships button** on the Relationships group.

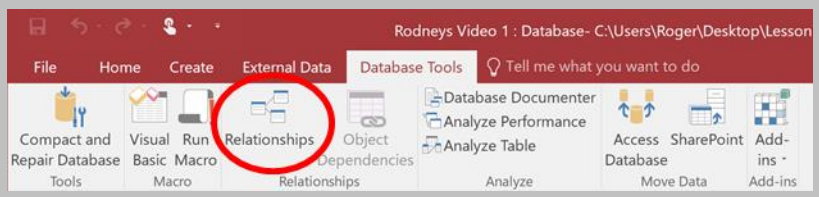
3. Click the **Tables** tab if necessary on the Show Table dialog box.
4. Select the first table to be added to the relationship.
5. Click **Add**.
6. Select the second table to be added to the relationship.
7. Click **Add**.
8. Click **Close** to close the Show Table dialog box.
9. Click the primary key field in the first table and then drag to the primary key in the second table.
10. Click **Create** in the Edit Relationship dialog box.

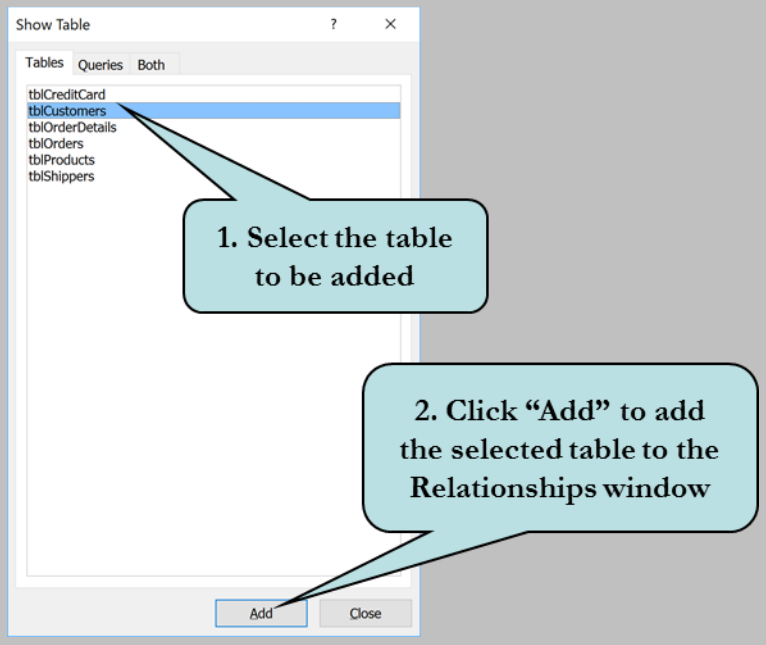


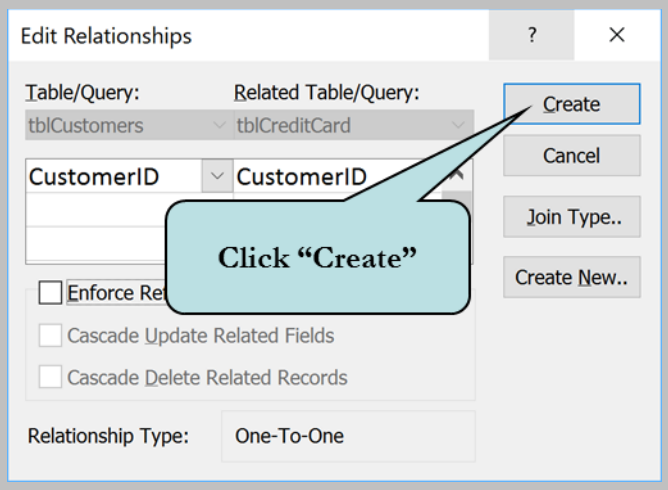
Note: If a previous relationship has already been created, the "Show Table" dialog box will not appear. Click the **Show Table** on the Data Tools Ribbon to display the Show Table dialog box.

Let's Try It!

What	Why
1. Open the **Microsoft Access** application.	Launches Microsoft Access and displays the Getting Started Pane.
2. Click the **Open other Files** in the left pane.	Displays the Open pane.
3. Click the **Browse** icon in the center pane.	Displays the Open dialog box.

What	Why
4. Click **Desktop** on the left side of your screen.	Displays the Desktop folder.
5. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
6. Select the **Rodneys Video 1** file and then click **Open**.	Opens the Rodneys Video 1 database.
7. Click the **Database Tools** tab on the Ribbon.	Switches to Database Tools commands and tools.
8. Click the **Relationships button** on the Relationships group on the Ribbon as shown.	Displays the Relationships window and then displays the Show Table dialog box. If there are already established relationships in your database, they will display in this window.
	
9. Select **tblCustomers.**	Selects the first table we want to add to the Relationships window.
10. Click **Add** as shown below.	Adds the selected table to the Relationships window.

What	Why
	
11. Select **tblCreditCard.**	Selects the second table we want to add to the Relationships Window.
12. Click **Add**.	Adds the selected table to the Relationships Window.
13. Click **Close**.	Closes the Show Table dialog box.
14. Click the **CustomerID** field in the tblCustomers table and then drag with your mouse to the **CustomerID** field in the **tblCreditCard** table. **Release** the mouse button.	Creates a link between the two tables and then displays the Edit Relationships dialog box.
15. Click **Create** as shown below.	Creates a relationship between the tblCustomers table and the tblCreditCard table, linking each table on the CustomerID field.

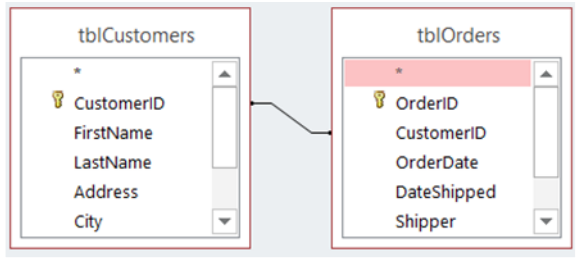
What	Why
	
16. Click the **Close button** on the Relationship Window.	Closes the Relationship Window.
17. Click **Yes** when asked if you wish to save the Relationships layout.	Saves the relationship that we just created.

1.3 Creating a One-to-Many Relationship

In lesson, you will learn how to create a one-to-many relationship.

A **One-to-Many Relationship** is a relationship where each record in the parent table has one or more related records in the child table. The one-to-many relationship is the most common type of relationship. A frequently used example is that of the Customer and Orders table. The Customer Table is the parent table and usually contains a Customer ID field which is set as a primary key. The Orders Table is the child table or the "many" side of the relationship. This table also contains a Customer ID field but it is not set as a primary key as a customer could place more than one order. This field is referred to as the **foreign key**.

In the example below, the tblCustomers table is the "one" table as each customer is listed only once. The tblOrders table is the "many" table as a customer could place more than one order.

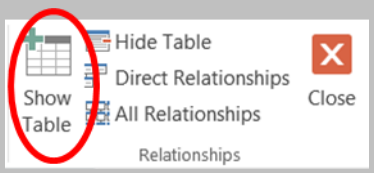


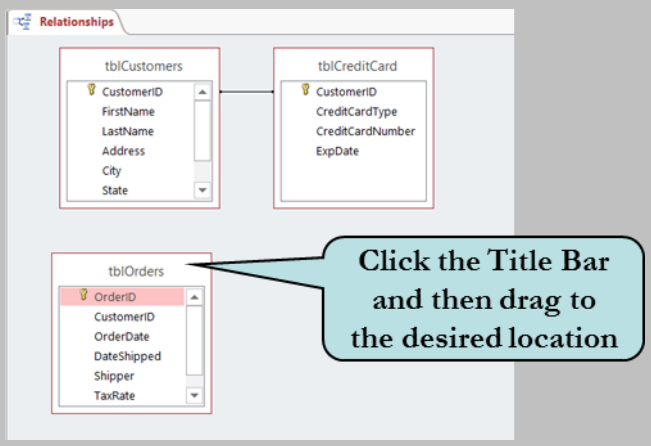
The "one" table The "many" table

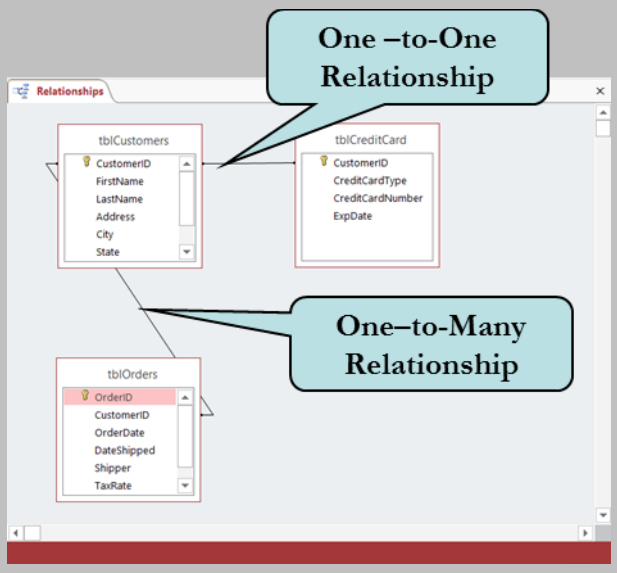
To Create a One-to-Many Relationship

1. Click the **Database Tools** tab on the Ribbon.
2. Click the **Relationships button** on the Ribbon.
3. Click the **Tables** tab if necessary on the Show Table dialog box.
4. Select the first table to be added to the relationship.
5. Click **Add**.
6. Select the second table to be added to the relationship.
7. Click **Add**.
8. Click **Close** to close the Show Table dialog box.
9. If necessary, click the **primary key** field in the parent table and then drag with your mouse to the **foreign key** in the child table (Access will most often automatically do this for you).
10. Click **Create** in the Edit Relationship dialog box.

Let's Try It!

What	Why
1. Click the **Database Tools** tab on the Ribbon.	Switches to Database Tools commands and tools.
2. Click the **Relationships button** on the Ribbon.	Displays the Relationships window. As there are already established relationships in the database, the Show Table dialog box does not automatically display.
3. Click the **Show Table** button on the Relationships group as shown.	Displays the Show Table dialog box. 
4. Select **tblOrders.**	Selects the table we want to add to the Relationships window.
5. Click **Add**.	Adds the selected table to the Relationship window.
6. Click **Close**.	Closes the Show Table dialog box.
7. Click the **Title Bar** for tblOrders and then drag the table so that it is underneath tblCustomers as shown below.	Clicking the Title Bar of a table selects that table and then allows you to drag it to a different area of the Relationships Window.

What	Why
	
8. Click the **CustomerID** field in the **tblCustomers** table and then hold down your mouse button.	Selects the field in the Parent table.
9. Drag with your mouse button held down to the **CustomerID** field in the **tblOrders** table and then **release** the mouse button.	Displays the Edit Relationships dialog box.
10. Click **Create**.	Creates a one-to-many relationship from tblCustomers (the "one" table) to tblOrders (the "many" table), linking both tables on the CustomerID field.
11. Observe the **Relationship Window** as shown below.	We now have a one-to-one relationship and a one-to-many relationship.

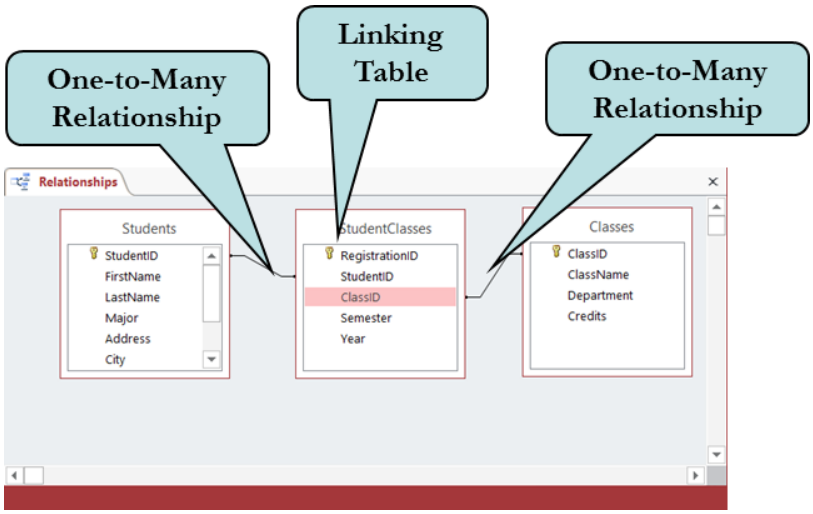
What	Why
	
12. Click the **Close icon** on the Ribbon.	Closes the Relationship Window.
13. Click **Yes** when asked if you wish to change the Relationships layout.	Saves the relationship that we just created.

1.4 Creating a Many-to-Many Relationship

In lesson, you will learn how to create a many-to-many relationship.

A **Many-to-Many Relationship** exists between a pair of tables if a single record in the first table can be related to one or more records in the second table, and a single record in the second table can be related to one or more records in the first table. The classic many-to-many example is the Students and Classes relationship – a student can take more than one class and a class is usually taken by more than one student. However, if you linked the Students and Classes table directly, you would receive a large amount of redundant data in your resultset. Inserting, Updating and Deleting data in this type of relationship can also be a problem.

You solve the many-to-many relationship problem be creating an **intermediary table** (sometimes referred to as a junction table) that contains the primary keys from each of the two tables, thus creating a one-to-many relationship between each table and the intermediary table. For instance, in the Students and Classes example, we would create a linking table perhaps called StudentClasses, which would contain the **StudentID** field and the **ClassID** field as **foreign keys**. We would then create a one-to-many relationship between the Students table and StudentClasses table and another one-to-many relationship between the Classes table and the StudentClasses table.



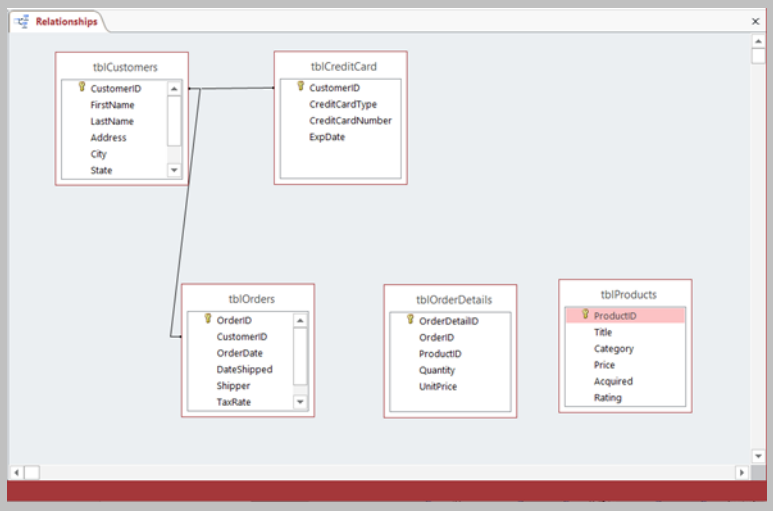
A Many-to-many relationship consisting of two One-to many-relationships with an Intermediary table (or linking table)

To Create a Many-to-Many Relationship

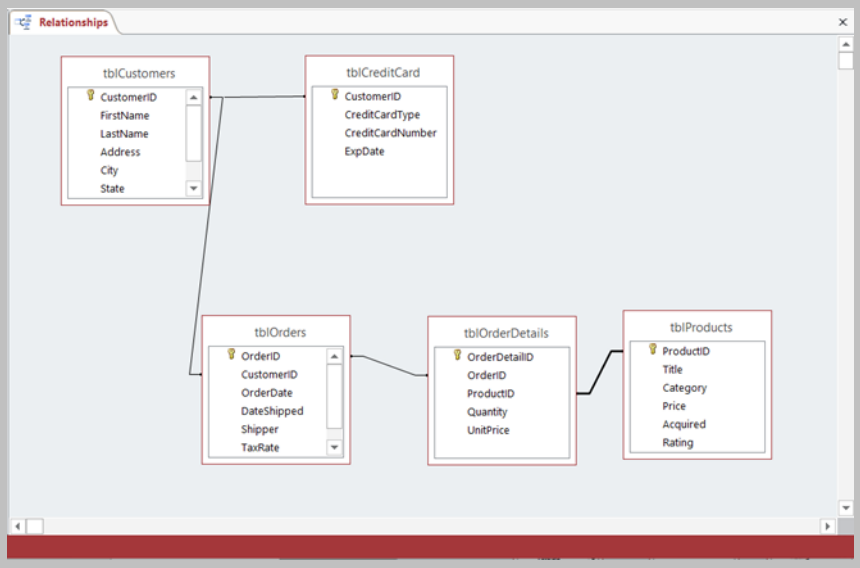
1. Click the **Database Tools** tab on the Ribbon.
2. Click the **Relationships button** on the Ribbon.
3. Click the **Tables** tab if necessary on the Show Table dialog box.
4. Select the **first** table to be added to the relationship.
5. Click **Add**.
6. Select the **second** table to be added to the relationship.
7 Click **Add**.
8. Select the **Linking table** (or intermediary table) to be added to the relationship (the linking table contains the primary key fields (as foreign keys) from the first and second tables).
9. Click **Close** to close the Show Table dialog box.
10. Click the **primary key** field in the first table and then drag with your mouse to the matching **foreign key** in the linking table.
11. Click **Create** in the Edit Relationship dialog box.
12. Click the **primary key** field in the second table and then drag with your mouse to the matching **foreign key** in the linking table.
13. Click **Create** in the Edit Relationships dialog box.

Let's Try It!

What	Why
1. Click the **Database Tools** tab on the Ribbon.	Switches to Database Tools commands and tools.
2. Click the **Relationships button** on the Ribbon.	Displays the Relationships window.
3. Click the **Show Table** button on the Relationships group.	Displays the Show Table dialog box.
4. Select **tblProducts.**	Selects the table we want to add to the Relationship window. The first table, tblOrders has already been added to the Relationship window.
5. Click **Add**.	Adds the selected table to the Relationships window.

What	Why
6. Select **tblOrderDetails.**	Selects the linking table we want to add to the Relationship window. There is a many-to-many relationship between Orders and Products (an order can contain more than one product and a product can be included in more than order). To solve this problem, we created an intermediary table, tblOrderDetails, which contains the ProductID field and the OrderID field.
7. Click **Add**.	Adds the selected table to the Relationships window.
8. Click **Close**.	Closes the Show Table dialog box.
9. Arrange your Relationships Window as shown below.	Arranges the Relationship Window so we can easily establish our relationships.
	
10. Click the **OrderID** field in the **tblOrders** table and then hold your mouse button down.	Selects the primary key field in the first table.
11. Drag to the **OrderID** field in the **tblOrderDetails** table and then release your mouse button.	Creates a link from tblOrders to tblOrderDetails (our linking table)

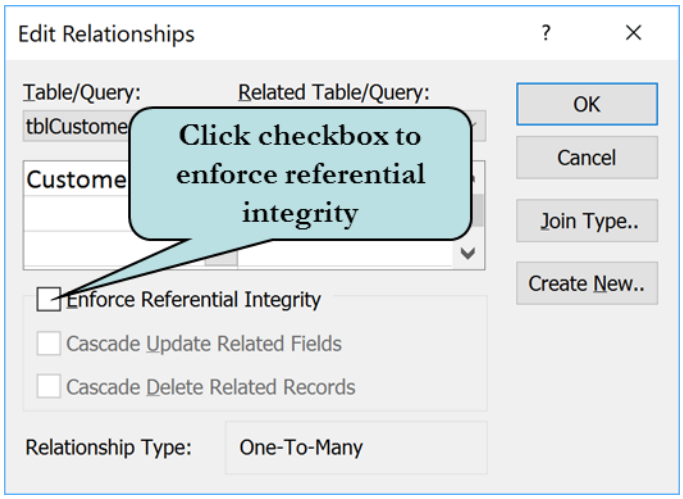
What	Why
12. Click **Create**.	Creates a one-to-many relationship between the tblOrders table and the tblOrderDetails table, linking each table on the OrderID field.
13. Click the **ProductID** field in the **tblProducts** table and then hold your mouse button down.	Selects the primary key field in the second table.
14. Drag to the **ProductID** field in the **tblOrderDetails** table and then release your mouse button.	Creates a link from tblProducts to tblOrderDetails (our linking table)
15. Click **Create**. Your Relationship window should look similar to the one below.	Creates a one-to-many relationship between the tblProducts table and the tblOrderDetails table, linking each table on the ProductID field.



1.5 Enforcing Referential Integrity

In lesson, you will learn how to enforce referential integrity in a relationship.

Referential Integrity is a system of rules that Access uses to ensure that relationships between records in related tables are valid, and that you don't accidentally delete or change data in one table and not in the other. For example, referential integrity ensures that you cannot enter a record into the Orders table for a customer that does not exist in the Customers table.



Once you have chosen to enforce referential integrity in your tables, your data is protected in the following ways:

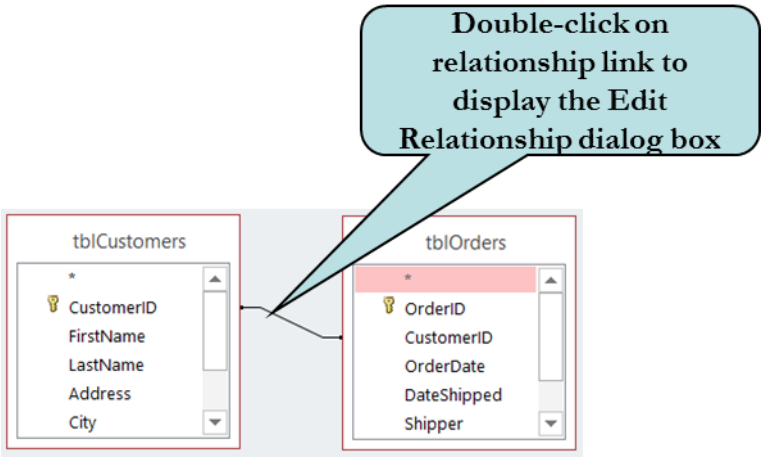
- You cannot enter a value in a foreign key field of a relationship if there is no matching value in the primary (or parent) table. For example, you cannot enter a record in the Orders table for a customer that does not exist in the Customers table.
- You cannot delete a record in the primary table if a related record exists in a matching table (unless you have checked the Cascade Delete Related Records option). For instance, you cannot delete a record for a customer in the Customers table if that customer has orders in the Orders table.
- You cannot change the value of the primary key field in the primary table if there are matching records in the related table (unless you have checked the Cascade Update Related Fields option).

However, before you can enforce referential integrity, there are certain conditions that must be met. These are:

- The matching field in the parent table must be a primary key or have a unique index.
- The related fields must have the same data type.
- The tables must reside in the same Access database

To Enforce Referential Integrity

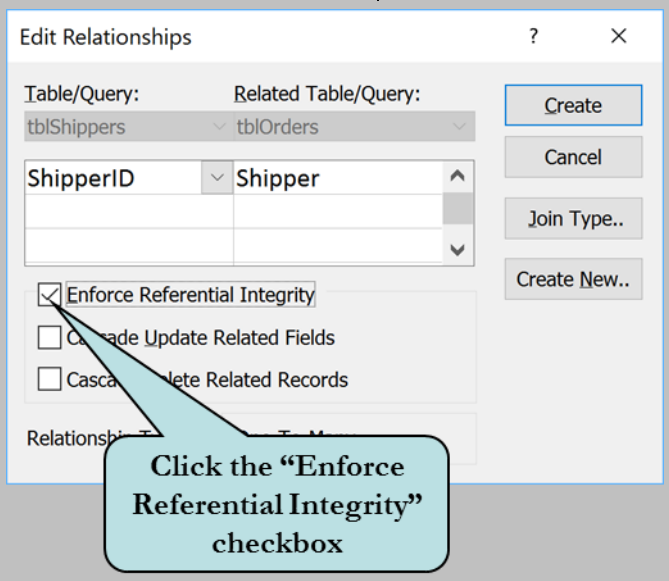
1. After creating the relationship link, check **Enforce Referential Integrity** in the Edit Relationships dialog box.
2. If the relationship has already been created, **double-click** on the relationship link to display the Edit Relationships dialog box and then check the Enforce Referential Integrity checkbox.



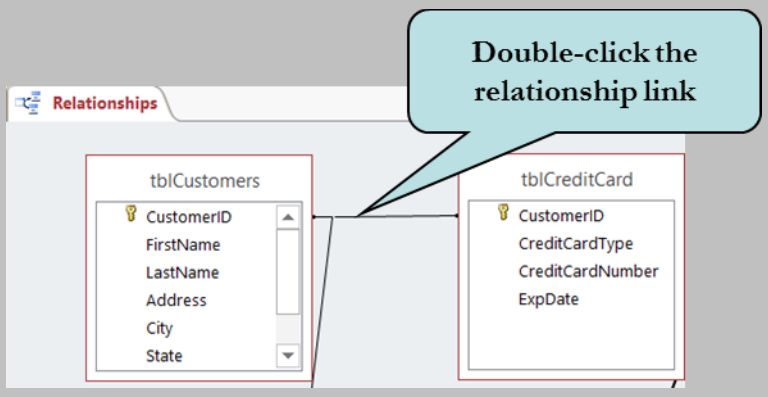
Let's Try It!

What	Why
1. Click the **Show Table** button on the Relationships group.	Displays the Show Table dialog box.
2. Select **tblShippers.**	Selects the table we want to add to the Relationship window.
3. Click **Add**.	Adds the selected table to the Relationship window.
4. Click **Close**.	Closes the Show Table dialog box.

What	Why
5. Click the **Shipper** field in the **tblOrders** table and hold down your mouse button.	Selects the field in the Parent Table.
6. Drag with your mouse button held down to the **ShipperID** field in the **tblShippers** table and then release your mouse button.	Creates a link from tblOrders to tblShippers.
7. Click the **Enforce Referential Integrity** checkbox as shown below.	Sets the option to enforce referential integrity.



8. Click **Create**.	Creates a one-to-many relationship between the tblOrders table and the tblShippers table with referential integrity enforced.
9. Double-click the **link line** between tblCustomers and tblCreditCard as shown.	Displays the Edit Relationships dialog box for that relationship.

What	Why
	
10. Click the **Enforce Referential Integrity** checkbox.	Enforces referential integrity for the relationship.
11. Click **OK**.	Closes the Edit Relationships dialog box.
12. Double-click the **link line** between tblProducts and tblOrderDetails.	Displays the Edit Relationships dialog box for that relationship.
13. Click the **Enforce Referential Integrity** checkbox.	Enforces referential integrity for the relationship.
14. Click **OK**.	Closes the Edit relationships dialog box.
15. Double-click the **link line** between tblCustomers and tblOrders.	Displays the Edit Relationships dialog box for that relationship.
16. Click the **Enforce Referential Integrity** checkbox.	Enforces referential integrity for the relationship.
17. Click **OK**.	Closes the Edit relationships dialog box.
18. Click the **Close icon** on the Ribbon. **Save** any changes.	Saves our relationship changes and closes the Relationship dialog box.
19. Double-click the **tblOrders** table.	Opens tblOrders in Datasheet view.

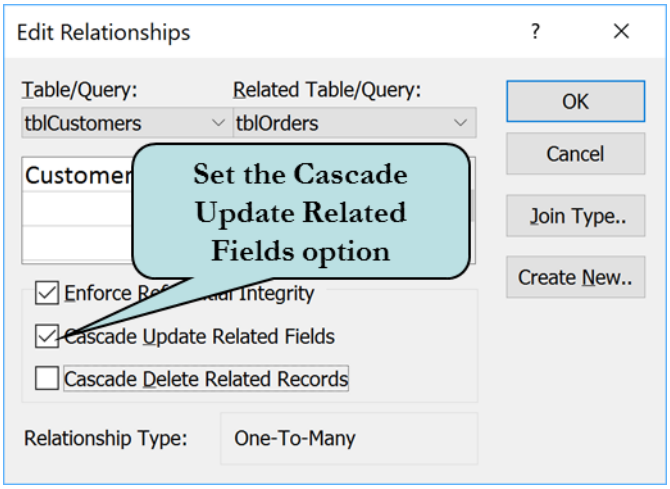
What	Why
20. Double-click in the **Shipper** field for the first record.	Selects the value in the Shipper field.
21. Type: **11**	Changes the value in the Shipper field to 11.
22. Press the **down arrow key**.	Attempts to move off the record. An error message is displayed telling us that a related record is required in tblShippers. As there is no shipper ID of 11 in tblShippers, referential integrity is violated and Access will not allow us to save the record.
23. Cllick **OK**.	Closes the error box and returns us to the shipper field.
24. Press the **Delete** key twice.	Deletes the value in the Shipper field.
25. Type: **3**	Enters a new value for the Shipper field.
26. Press the **down arrow key**.	Moves off of the record. We did not receive an error message this time because a Shipper ID of 3 exists in tblShippers.
27. Click the **Close button** for tblOrders.	Closes tblOrders.

1.6 Cascade Update Related Fields

In lesson, you will learn how to set the Cascade Update Related Fields option.

Once referential integrity is enforced, you may wish to set the **Cascade Update Related Fields** option in the Edit Relationships dialog box. With this option set, update options that would normally be prevented by referential integrity rules are allowed.

Setting the Cascade Update Related Fields option specifies that any time you change the primary key of a record in the primary (or parent) table, Access will automatically update the primary key to the new value in all related records. For example, if you change a customer's ID in the Customers table, the CustomerID field in the Orders table is automatically updated for every one of the customer's orders. This prevents the relationship from being broken and the creation of orphaned records.

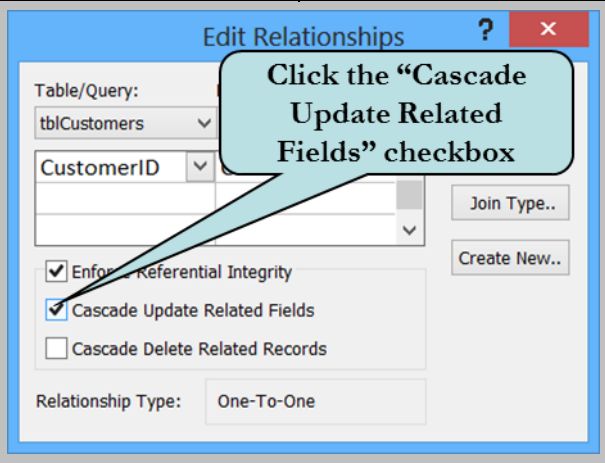


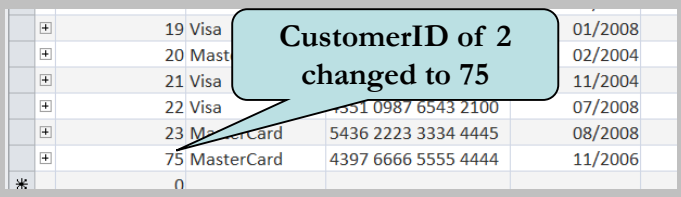
To Set the Cascade Update Related Fields Option

1. After creating the relationship link, check the **Cascade Update Related Fields** checkbox in the Edit Relationships dialog box.
2. If the relationship has already been created, **double-click** the relationship link to display the Edit Relationships dialog box.

Let's Try It!

What	Why
1. Double-click **tblCustomers**.	Opens tblCustomers in datasheet view.
2. Double-click in the **CustomerID** field for the second record (Mary Nolan).	Selects the CustomerID field for customer 2.
3. Type: **75**.	Changes the CustomerID for Mary Nolan to 75.
4. Press the **down arrow key**.	Attempts to move off the record but we receive an error message that the record cannot be changed. Referential integrity forbids us from changing this record because there is a related record in tblOrders and tblCreditCard.
5. Click **OK**.	Closes the error box.
6. Press the **Esc** key.	Cancels the attempted change.
7. Click the **Close button** for tblCustomers.	Closes tblCustomers.
8. Double-click **tblCreditCard** and observe the record for Mary Nolan.	Opens tblCreditCard in Datasheet view. Note that the CustomerID for MaryNolan is 2.
9. Click the **Close button** for tblCreditCard.	Closes tblCreditCard.
10. Click the **Database Tools** tab on the Ribbon.	Switches to Database Tools commands and tools.
11. Click the **Relationships button** on the Ribbon.	Displays the Relationships window.

What	Why
12. Double-click the **link line** between **tblCustomers** and **tblCreditCard**.	Displays the Edit Relationships dialog box for that relationship.
13. Click the **Cascade Update Related Fields** checkbox as shown below.	Sets the option to Cascade Update Related Fields for the relationship.
	
14. Click **OK**.	Closes the Edit Relationships dialog box.
15. Double-click the **link line** between **tblCustomers** and **tblOrders**.	Displays the Edit Relationships dialog box for that relationship.
16. Click the **Cascade Update Related Fields** checkbox.	Sets the option to Cascade Update Related Fields for the relationship.
17. Click **OK**.	Closes the Edit Relationships dialog box and enforces referential integrity.
18. Click the **Close icon** on the Ribbon. **Save** any changes.	Saves our relationship changes and closes the Relationship Window.
19. Double-click **tblCustomers**.	Opens tblCustomers in Datasheet view.
20. Double-click in the **CustomerID** field for the second record (Mary Nolan).	Selects the CustomerID field for customer 2.

What	Why
21. Type: **75**.	Changes the CustomerID for Mary Nolan to 75.
22. Press the **down arrow key**.	This time, we were able to change the record as we have set the Cascade Update Related Records option. The related records will have also been updated.
23. Click the **Close button** for tblCustomers.	Closes tblCustomers.
24. Double-click **tblCreditCard**.	Opens tblCreditCard in datasheet view. Notice that the CustomerID for record 2 has been changed to 75.
	
25. Click the **plus (+) symbol** to the left of the 75.	Displays the related record for Mary Nolan in the Customer table.
26. Press the **Ctrl + W** keystroke combination.	Closes tblCreditCard.

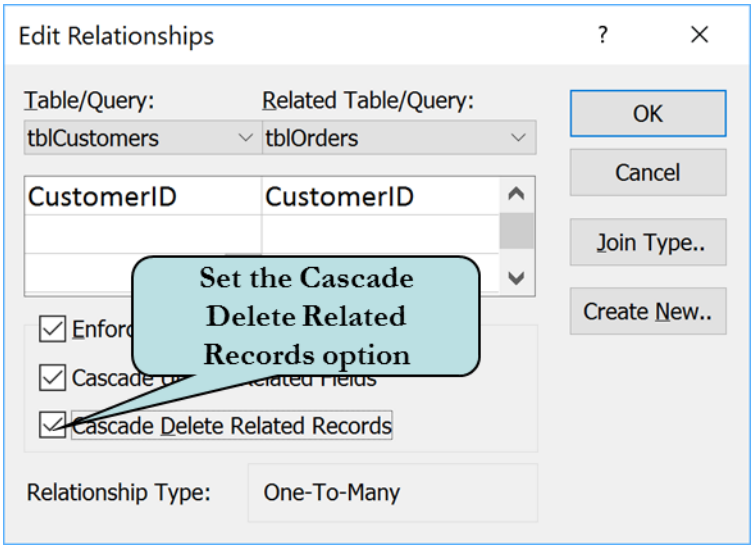
1.7 Cascade Delete Related Records

In lesson, you will learn how to set the Cascade Delete Related Records option.

Once referential integrity is enforced, you may wish to set the **Cascade Delete Related Records** option in the Edit Relationships dialog box. With this option set, delete options that would normally be prevented by referential integrity rules are allowed.

Setting the Cascade Delete Related Records option specifies that when you delete a record in the primary (or parent) table, all of the related records will be deleted as well. For example, if you delete a customer in the Customers table, all orders for that customer in the Orders table will automatically be deleted. This prevents the relationship from being broken and the creation of orphaned records.

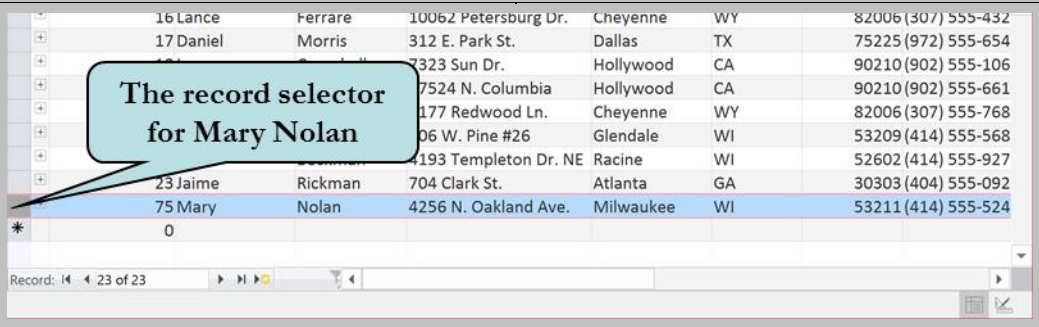
If this option is not set and you wished to delete a customer along with his or her orders, you would first need to delete all records from the orders table before being able to delete the customer.



To Set the Cascade Delete Related Records Option

1. After creating the relationship link, check the **Cascade Delete Related Records** checkbox in the Edit Relationships dialog box.
2. If the relationship has already been created, **double-click** the relationship link to display the Edit Relationships dialog box. Then, check the **Cascade Delete Related Records** checkbox in the Edit Relationships dialog box.

Let's Try It!

What	Why
1. Double-click **tblCustomers**.	Opens tblCustomers in Datasheet view.
2. Click the **record selector** for Mary Nolan, CustomerID 75 as shown below.	Selects the record for Mary Nolan.
	
3. Press the **Delete** key.	Attempts to delete the selected record. However, referential integrity forbids us from deleting this record because there is a related record in tblOrders and tblCreditCard.
4. Click **OK**.	Closes the error box.
5. Click the **Close button** for tblCustomers.	Closes tblCustomers.
6. Click the **Database Tools** tab on the Ribbon.	Switches to Database Tools commands and tools.
7. Click the **Relationships button**.	Displays the Relationships window.
8. Double-click the **link line** between **tblCustomers** and **tblCreditCard**.	Displays the Edit Relationships dialog box for that relationship.
9. Click the **Cascade Delete Related Records** checkbox.	Sets the Cascade Delete Related Records option for the relationship.

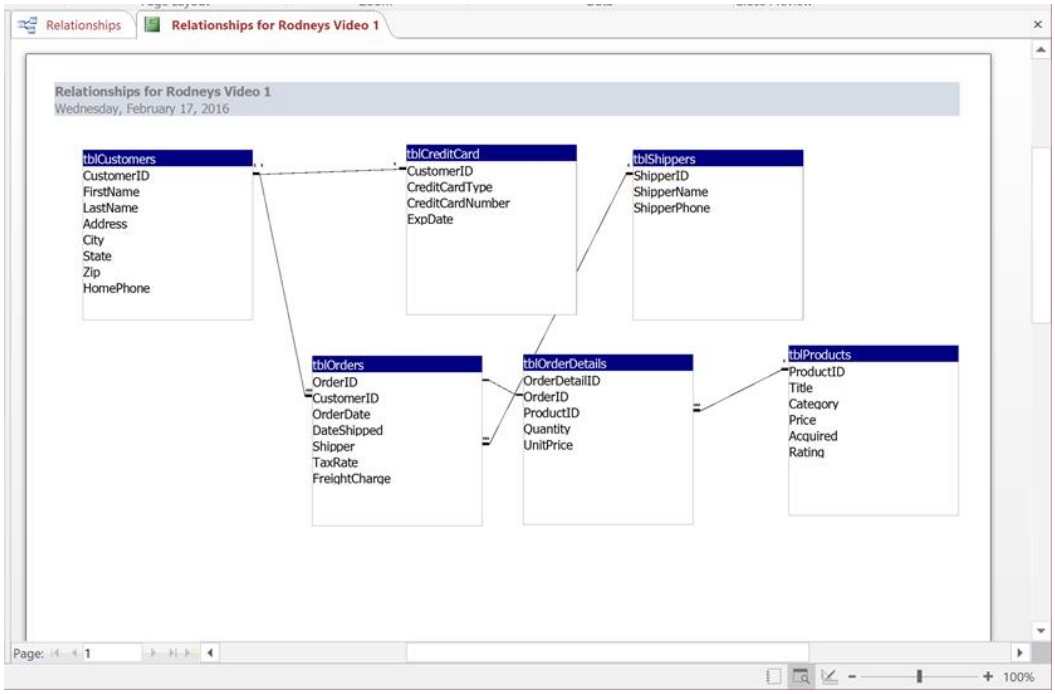
What	Why
10. Click **OK**.	Closes the Edit Relationships dialog box.
11. Double-click the **link line** between **tblCustomers** and **tblOrders** as shown.	Displays the Edit Relationships dialog box for that relationship.
12. Click the **Cascade Delete Related Records** checkbox.	Sets the Cascade Delete Related Records option for the relationship.
13. Click **OK**.	Closes the Edit Relationships dialog box.
14. Click the **Close icon** on the Ribbon. **Save** any changes.	Saves our relationship changes and closes the Relationship dialog box.
15. Double-click **tblCustomers**.	Opens tblCustomers in Datasheet view.
16. Click the **record selector** for Mary Nolan, CustomerID 75.	Selects the record for Mary Nolan.
17. Press the **Delete** key.	We receive a message box telling us that if we delete this records, related records will be deleted as well.
18. Click **Yes**.	Deletes the record for Mary Nolan as well as all related records in tblCreditCard and tblOrders.
19. Click the **Close button** for tblCustomers.	Closes tblCustomers.
20. Double-click **tblCreditCard**.	Opens tblCreditCard in datasheet view. Notice that the record for CustomerID 75 is gone.
21. Click the **Close button** for tblCreditCard.	Closes tblCreditCard.

What	Why
22. Double-click **tblOrders**.	Opens tblOrders in Datasheet view. Notice that the only record in tblOrders, CustomerID 75, is gone.
23. Click the **Close button** for tblOrders.	Closes tblOrders.

1.8 Creating & Printing a Relationship Report

In lesson, you will learn how to create and print a relationship report.

Once your relationships are established, you can **create and print a report** which illustrates the relationships in your database. The report is displayed in Print Preview, allowing you then to either send a copy to the printer or save the report as a PDF, XPS, Word, text or HTML document. When in Print Preview, you can also make additional changes to your report by using the tools on the contextual Print Preview Ribbon. For instance, you can change the paper size, paper orientation, and change the page margins.

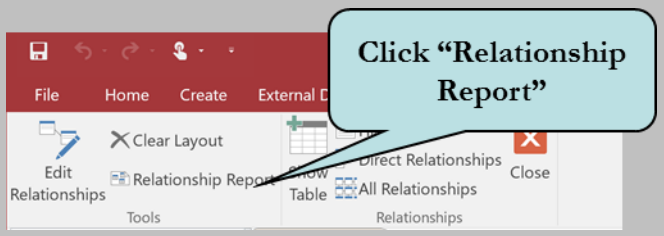


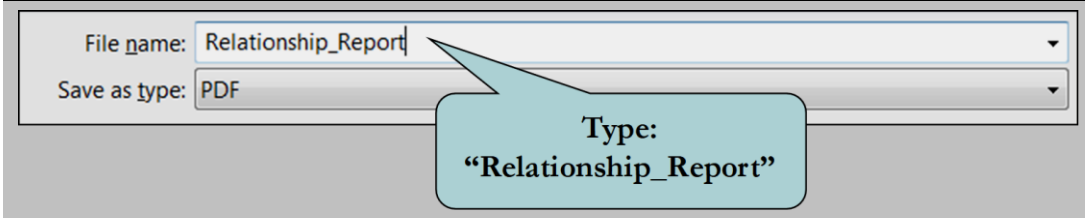
To Create and Print a Relationship Report

1. Click the **Database Tools** tab on the Ribbon.
2. Click the **Relationships button** on the Ribbon.
3. Click the **Relationship Report button** on the Tools group of the contextual Design Ribbon. The relationship report will display in Print Preview mode.
4. To send your relationship report to the printer, click the **Print button** and specify any desired settings.

5. To modify any additional relationship report options, make your selections on the Print Preview Ribbon.
6. Click the **Close Print Preview** button to display the relationship report in Design View.
7. To save your relationship report, click the **Save button** on the Quick Access toolbar and enter a name for your report.
8. Click **OK**.

Let's Try It!

What	Why
1. Click the **Database Tools** tab on the Ribbon.	Switches to Database Tools commands and tools.
2. Click the **Relationships button** on the Ribbon.	Displays the Relationships window.
3. Click the **Relationship Report button** on the Tools group on the contextual Design Ribbon as shown below.	Displays the report in Print Preview.
	
4. Click the **PDF or XPS** button on the Data group on the Ribbon.	Displays the Publish as PDF or XPS dialog box, allowing us to export our report to PDF or XPS format.
5. Ensure that **PDF** is displayed in the Save as Type box.	Specifies that we want to export our report in PDF format.
6. Click **Desktop** on the left side of your screen.	Displays the Desktop folder.

What	Why
7. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
8. In the **File Name** box, type: **Relationship_Report** as shown below.	Specifies a name for our relationship report.
	
9. Uncheck the **Open File after publishing** checkbox if it is checked.	Sets the option not to open the file after it is exported.
10. Click **Publish**.	Exports our relationship report to PDF format and displays the Export PDF dialog box.
11. Click **Close**.	Closes the Export PDF dialog box.
12. Click the Close button on the Relationships Report window.	Displays a dialog box asking you if you wish to save the relationship report.
13. Click **No**.	Closes the report without saving it in the database.
14. Click the **File tab** on the Ribbon and then click **Close** from the File Options menu.	Closes the database.

Lesson Summary – Database Relationships

- In this Lesson, you learned that a relationship is a way of formally defining how tables are related to each other. You learned that there are three categories of relationships: One-to-one, One-to-many and Many-to-many.
- Then, you learned how to create a One-to-one relationship where each table has only one related record by clicking the Relationships button on the Database Tools Ribbon and dragging from the key field of the first table to the key field of the second table.
- Next, you learned how to create a One-to-many relationship, where each record in the parent table has one or more related records in the child table. Drag from the key field of the parent table to the common "many" field (the foreign key) in the child table.
- Next, you learned how to create a Many-to-many relationship, where a single record in the first table can be related to one or more records in the second table, and a single record in the second table can be related to one or more records in the first table. You learned that in order to create a Many-to-many relationship, you need to add an intermediary table which contains the primary keys from each of the two tables.
- Next, you learned that Referential Integrity is a system of rules that Access uses to ensure that relationships between records in related tables are valid, and that you don't accidentally delete or change data in one table and not in the other. To enforce Referential Integrity, double-click the Relationship line between the tables and click the Enforce Referential Integrity checkbox.
- Next, you learned how to set the Cascade Update Related Fields option, which specifies that any time you change the primary key of a record in the primary (or parent) table, Access will automatically update the primary key to the new value in all related records. To set this option, double-click the Relationship line between the tables and click the Cascade Update Related Fields checkbox.
- Next, you learned how to set the Cascade Delete Related Records option, which specifies that when you delete a record in the primary (or parent) table, all of the related records will be deleted as well. To set this option, double-click the Relationship line between the tables and click the Cascade Delete Related Records checkbox.
- Lastly, you learned how to create and print a relationship report, which illustrates the relationships in your database. Click the Relationship Report button on the Tools group of the contextual Design Ribbon to display the relationship report in Print Preview.

Lesson 1 Quiz

1. In a One-to-Many Relationship,
   A. Each record in the first table has only one related record in the second table.
   B. Each record in the second table has many related records in the first table.
   C. Each record in the first table has one or more related records in the second table.
   D. Each record in one table may have many related records in the second table, and those related records may in turn have related records in the first table.

2. You have one table that contains a list of employees and another table that contains a list of the employees' social security numbers. What type of relationship would you create?

3. The Relationships button can be found under what Ribbon tab?
   A. Relationships
   B. Database Tools
   C. Create
   D. Home

4. You want to add a new table to an existing relationship. How do you accomplish this?
   A. Click the Add Table button on the contextual Design Ribbon, click the table you want to add and then click Add.
   B. Click the Insert Table button on the contextual Design Ribbon, click the table you want to add and then click Add.
   C. Click the Show Table button on the contextual Design Ribbon, click the table you want to add and then click Add.
   D. Double-click the table you want to add in the Navigation Bar and then click the Add button on the Home Ribbon.

5. A frequent example of a _____ (fill in the blank) relationship is the Customers and Orders table.

6. A set of rules that Access uses to ensure that the relationships between records and related tables is valid is called:
   A. Referential Integrity
   B. Cascading Records
   C. Primary Key Criteria
   D. Foreign Key Integrity

7. A Primary Key can have duplicate values but a foreign key cannot.
   A. True
   B. False

8. You want to be able to change the customer number in a Primary Key field and have the customer number in all related fields update as well. What option would you have to set to be able to do this?
   A. Referential Integrity
   B. Cascade Delete Related Records
   C. Cascade Update Integrity
   D. Cascade Update Related Fields

9. When creating a Many-to-Many relationship between two tables, you need to add a(n) _____ table that contains the Primary key fields from both tables. (fill in the blank)

10. How can you display the Edit Relationships dialog box?

11. You have a customer and orders table with the Cascade Delete Related Records option set. What will occur if you delete a customer from the Customers table?
    A. Access will not allow you to delete a customer if there are orders.
    B. The records in the orders table will then be orphaned and you will need to delete them manually.
    C. The related records in the orders table will be deleted as well.
    D. The related records in the orders table will be assigned a new customer number.

12. Which is NOT a format to which you can export a Relationship Report?
    A. Word
    B. PDF
    C. Text File
    D. PowerPoint

LAB 1 – ON YOUR OWN

1. Open the **Lab1** database in the Lesson Files folder.

2. Create a relationship between the **Students** table and the **StudentClasses** table. Link the two tables on the **StudentID** field. Close the Edit Relationships dialog box.

3. Add the **Classes** table to the Relationship window.

4. If necessary, create a relationship between the **Classes** table and **StudentClasses** table (Access may have automatically done this for you). Link the two tables on the **ClassID** field. Enforce referential integrity and check the Cascade Update Related Fields and Cascade Delete Related Records checkboxes. Click **OK**.

5. Double-click the relationship link between the **Students** table and the **StudentClasses** table. Enforce referential integrity and check the Cascade Update Related Fields and Cascade Delete Related Records checkboxes.

6. Close the Relationships Window and save any changes.

7. Open the **Students** table. Change the **StudentID** of **Monica Fielen** to **80000005**. Close the Students table.

8. Open the StudentClasses table. Can you find the record for Monica Fielen? Close the StudentClasses table.

9. Create a relationship report and export it in PDF format to the Lesson Files folder. Name the report: **My_Lab_1**

10. Close the Lab1 database.

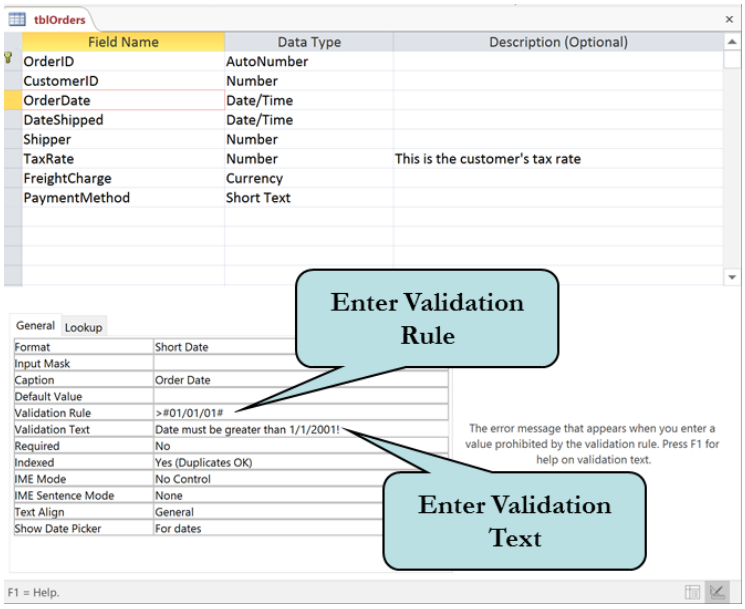
Lesson 2 - Working with Tables

Lesson Topic

2.1 Setting Validation Rules

In this lesson, you will learn how to set validation rules for your data.

To ensure that users enter valid data in a field, you can set a **validation rule** for data entry. A validation rule is a property that defines valid input entries for a field in a table. For example, if you started your business on February 15, 2013, you could set a validation rule for the order date field to be >=2/15/2013. If the data entered does not meet the requirements of the validation rule, the user receives an error message. You can even customize the error message the user receives by typing in the desired error message in the **validation text** box in Table Design view.



You can either type the validation rule directly in the Validation Rule box under field properties or click the build button to the right of the property. The build button launches the **expression builder**, an Access tool that allows you to create an expression by selecting common functions, constants and operators from the expression window.

To Set a Validation Rule

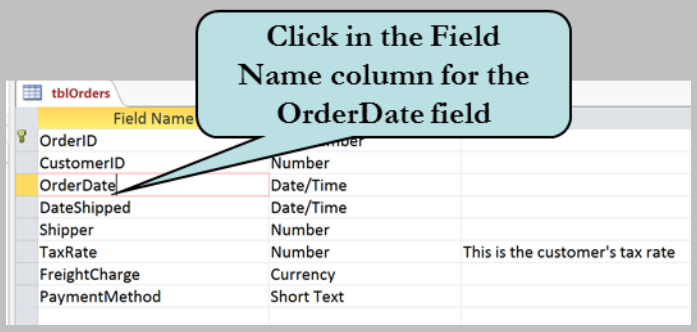
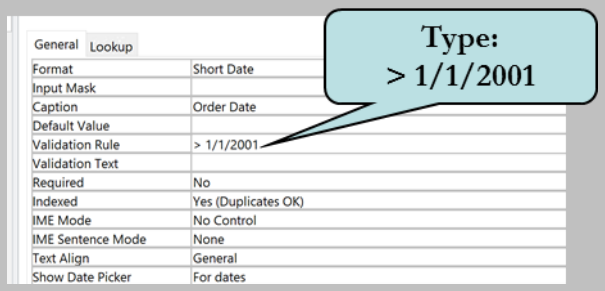
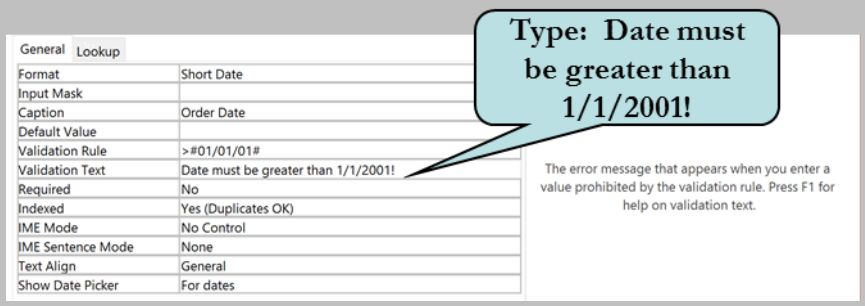
1. Open the table in Design View that contains the field you want to restrict.
2. Click anywhere in the row of the field for which you want to set a validation rule.
3. Type in the expression in the **Validation Rule** box under Field Properties.
4. If desired, type in a custom error message in the **Validation Text** box under Field Properties.

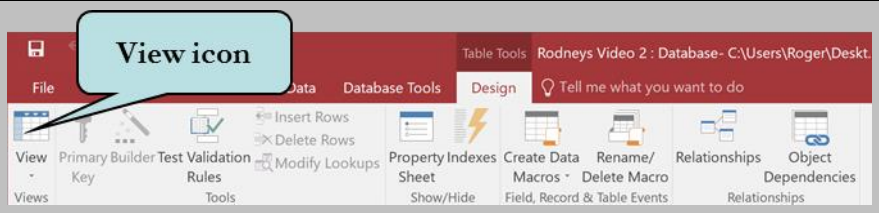
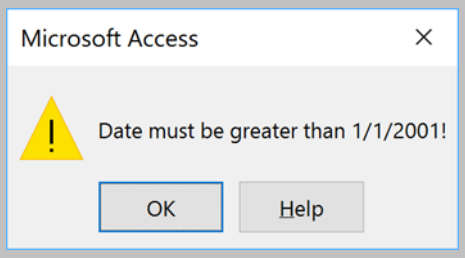
Validation Rule Examples

Validation Rule Expression	Description
>=50	Entry must be greater than or equal to 50
"MI" or "WI"	Entry must be either MI or WI
Between 5/1/2009 And 6/30/2014	Date must be between 5/1/2009 and 6/30/2014
>5/1/2013	Date must be greater than 5/1/2013
=Date()	Entry must be today's date

Let's Try It!

What	Why
1. Click the **File** tab and then click **Open** from Backstage view.	Displays the Open dialog box.
2. Click the **Browse** icon in the center pane.	Displays the Open dialog box.
3. Click **Desktop** on the left side of your screen.	Displays the Desktop folder.
4. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
5. Select the **Rodneys Video 2** file and then click **Open**.	Opens the Rodneys Video 2 database.
6. Right-click on **tblOrders** in the Navigation Pane and then click the **Design View**.	Displays tblOrders in Design view.
7. Click in the Field Name column for the **OrderDate** field as shown below.	Selects the OrderDate Field.

What	Why
	
8. Under Field Properties, click in the **Validation Rule** box and then type: **>1/1/2001** as shown below.	Sets a validation rule for the OrderDate field that the date must be greater than January 1, 2001.
	
9. In the **Validation Text** box, type: **Date must be greater than 1/1/2001!** as shown below.	Enters a custom error message that the user receives if the validation rule is violated.
	
10. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.

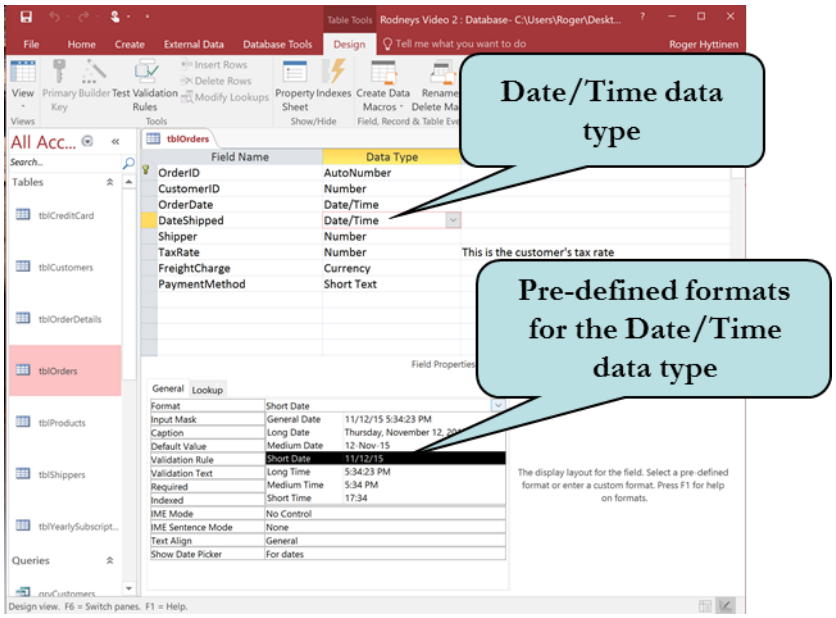
What	Why
11. Click **Yes** when the message box appears.	Access asks us if it should check to ensure that existing data in our table does not violate our new validation rule.
12. Click the **View** icon on the Ribbon.	Switches to Datasheet view.
	
13. Click in the new row under **CustomerID** and type: **13.**	Creates a new row and enters a value of 13 for the CustomerID.
14. Press the **Tab** key.	Moves to the next field.
15. Type: **6/25/2000**	Enters a value for the OrderDate field.
16. Press **Tab**.	As the data we entered in the OrderDate field violates the validation rule we set, our custom error message is displayed. 
17. Click **OK**.	Closes the error message box and returns us to the OrderDate field so that we can enter valid data.
18. Press the **Backspace** key once and then type: **2**.	Changes the year to 2002.

What	Why
19. Press **Tab**.	Moves to the next field. Our validation rule is no longer violated.
20. Enter the rest of the data for the current record as follows. Press **Tab** to move from one field to the next. **Ship Date:** **7/1/02** **Shipper:** **3** **Tax Rate:** **.06** **Freight Charge:** **$4.95**	Enters the data for the remaining fields of the current record.

2.2 Formatting Fields

In this lesson, you will learn how to modify the Format property of a field.

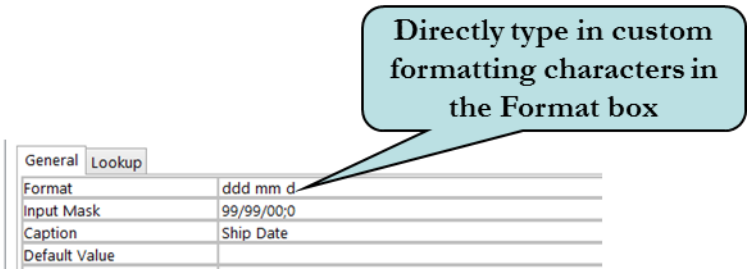
Another field property that you will find useful is the **Format** property. The format property is used to change how the data is displayed on your screen and in printed form. Access has several pre-defined formats that you can use to change the appearance of your data. Each data type in Access has its own set of format property settings. For example, you can format a date/time field so that it displays the date as Thursday, August 28, 2015 or as 8/28/2015.



There may be times when the pre-defined formats are not sufficient for your needs. Luckily, there are a wide variety of **custom formats** that you can use. Custom formats are formatting symbols that are entered manually in the format field rather than choosing a pre-defined format from a list. For instance, you may want a date field to be displayed as Wed May 01. To accomplish this, you would enter: **ddd mmm dd** in the format field. Or to display your date in European format with the month preceding the date, enter: **dd/mm/yyyy**.

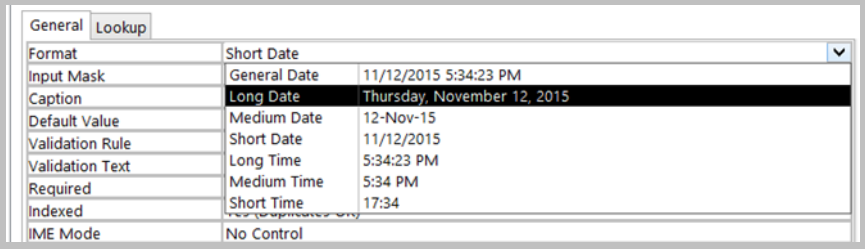
To Change the Formatting of Fields

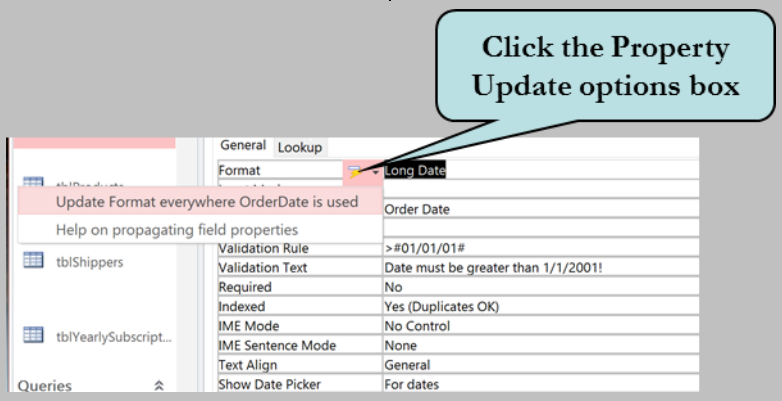
1. Open the table in Design View that contains the field you wish to format.
2. Click anywhere in the row of the field to be formatted.
3. To use a pre-defined format, click in the **Format** box under Field Properties, click the arrow on the right of the box and then select a pre-defined format from the drop-down list.
4. To use a custom format, type the desired formatting characters directly into the Format box.



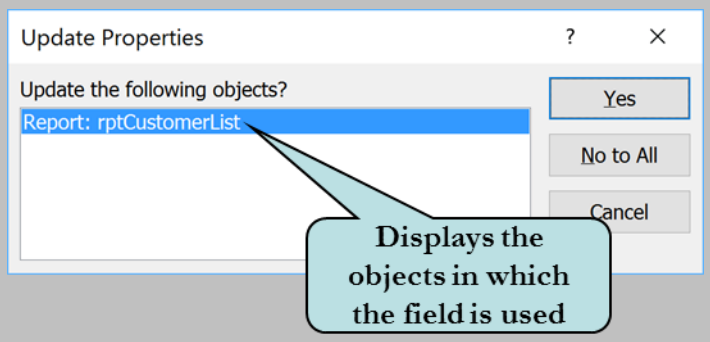
Let's Try It!

What	Why
1. Click the **View** button on the Ribbon.	Switches to Design View.
2. Click in the Field Name column for the **OrderDate** field.	Displays the field properties for the OrderDate field.
3. Under Field Properties, click in the **Format** box.	Activates the Format box for the OrderDate field.
4. Click the arrow on the right of the Format box and then select **Long Date** from the drop-down list as shown below.	Changes the format of the OrderDate field to Long Date.



What	Why
5. Click the **Property Update Options box** as shown below and select **"Update Format everywhere OrderDate is used"** as shown below.	The Property Update Options box allows you the option of automatically updating the properties of any controls in all forms or reports that are bound to the field in a table when that field is updated in the table. This feature is known as "Propagating Field Properties." When a change is made to a field in a table, the Property Update Options Box is displayed.
	
6. Click **OK**.	As there were no controls in any forms or reports bound to the OrderDate field, Access informs us that no fields needed to be updated.
7. Click in the Field Name column for the **DateShipped** field.	Displays the field properties for the DateShipped field.
8. Under Field Properties, double-click in the **Format** box.	Selects the current format setting for the DateShipped field.
9. Type: **dddd mmm dd**	Enters a custom format of: Monday Jul 23
10. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.

What	Why
11. Click the **View** button and then observe the OrderDate and DateShipped fields. Widen the columns if needed in order to view all of the data.	The formatting of our data has changed based on what we entered in the Format box.
12. Click the **Close** button for tblOrders. **Save** changes if prompted.	Closes tblOrders.
13. Double-click **tblCustomers** and then click the **View** button.	Displays tblCustomers in Design View.
14. Click in the Field Name column for the **City** field.	Displays the field properties for the City field.
15. Under Field Properties, click in the **Format** box and then type: **>**	Enters a custom text format that will display all data in the field in upper case.
16. Press the **Down Arrow** key.	Moves to the next field property and displays the Property Update Options Box.
17. Click the **Property Update Options box** and select **"Update Format Everywhere City is used."** Observe the **Update Properties dialog box** as shown below.	Displays the Update Properties dialog box, listing all form and report objects where the field is used. Here, you have to option of updated individual objects or all objects at once.

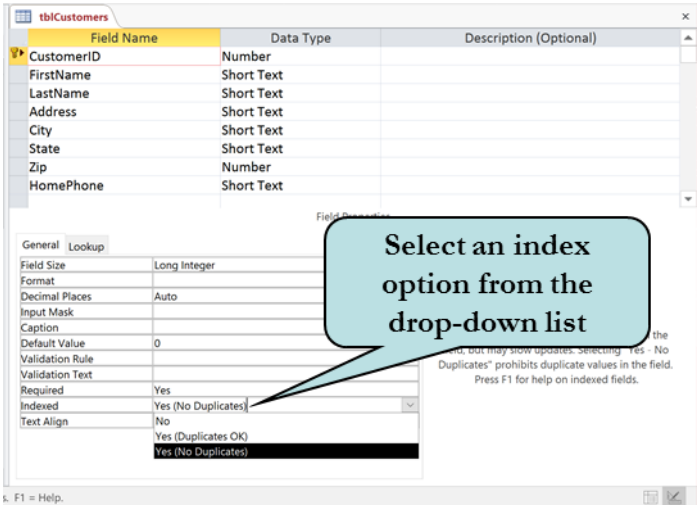


What	Why
18. Click **Yes.**	Updates the properties of the City field in the rptCustomerList to the new format.
19. Click the **Save** button.	Saves the design changes.
20. Click the **View** button and observe the City field.	All data in the City field is displayed in uppercase.
21. Press the **Ctrl + W** keystroke combination.	Closes tblCustomers.

2.3 Indexing Fields

In this lesson, you will learn how to index a field in a table.

Indexes on a field in a table enable Access to find and sort records more quickly. It is a good idea to index fields in which you frequently search for data or fields that you sort by in queries. This will substantially speed up your searches and queries, especially when your database becomes large. However, be careful not to index too many fields as this can have the opposite effect and will actually slow down your searching and sorting. All data types can be indexed **except** for OLE, calculated and hyperlink fields.



Primary Key fields are automatically indexed with no duplicates allowed. There are three index options from which to choose:

- **No** (not indexed)
- **Yes (Duplicates OK)**
- **Yes (No Duplicates)**

A good example of a situation where would use the **Yes (Duplicates OK)** option, is setting an index for a zip code, as searching for data in this field or sorting by this field is common. However, as you may possibly have entries for people who share the same zip code, you would need to **allow duplicates entries** in that field.

After you create your indexes, you can view or edit them by clicking the **Indexes button** on the Show/Hide group of the Ribbon. From here, you can add new indexes as well as change the name of your indexes and the sort order of your indexes.

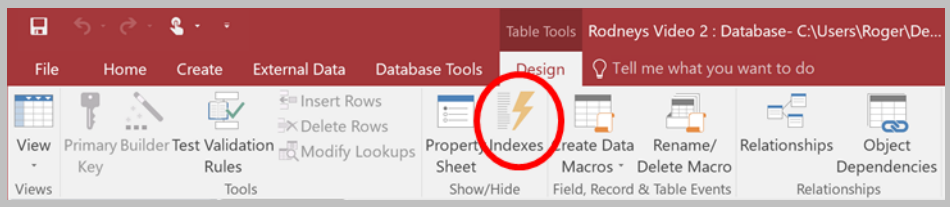
To Index a Field

1. Select the table that contains the field you wish to index.
2. Switch to **Design View**.
3. Click anywhere in the row of the field to be indexed.
4. Under Field Properties, click in the **Indexed** box.
5. Click the arrow in the Indexed box and then choose the desired Index option from the drop-down list.
6. To view or edit indexes, click the **Indexes button** on the Show/Hide group and make any desired changes.

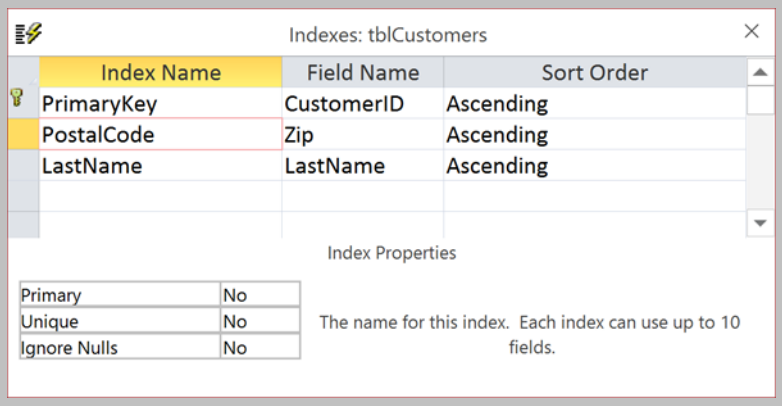
Let's Try It!

What	Why
1. Double-click **tblCustomers** and then click the **View** button.	Displays tblCustomers in Design View.
2. Click in the Field Name column for the **Zip** field.	Displays the field properties for the Zip field.
3. Under Field Properties, click in the **Indexed** box.	Sets the insertion point in the Indexed field property for the Zip field.
4. Click the arrow in the Indexed box and then select **Yes (Duplicates OK)** as shown below.	Indexes the Zip field and selects the Duplicates OK option.
	
5. Click in the Field Name column for the **LastName** field.	Displays the field properties for the LastName field. As Last Name is a common field to search, we will index this field as well.
6. Under Field Properties, click in the **Indexed** box.	Sets the insertion point in the Indexed field property for the LastName field.

What	Why
7. Click the arrow in the Indexed box and then select **Yes (Duplicates OK)**.	Indexes the LastName field and then selects the Duplicates OK option.
8. Click the **Indexes button** on the Show/Hide group of the Ribbon as shown below.	Displays the Indexes dialog box.



9. Double-click the **Zip** field in the Index Name column and type: **PostalCode** as shown below.	Provides a different name for the index. Note that the field name remains the same in the table.

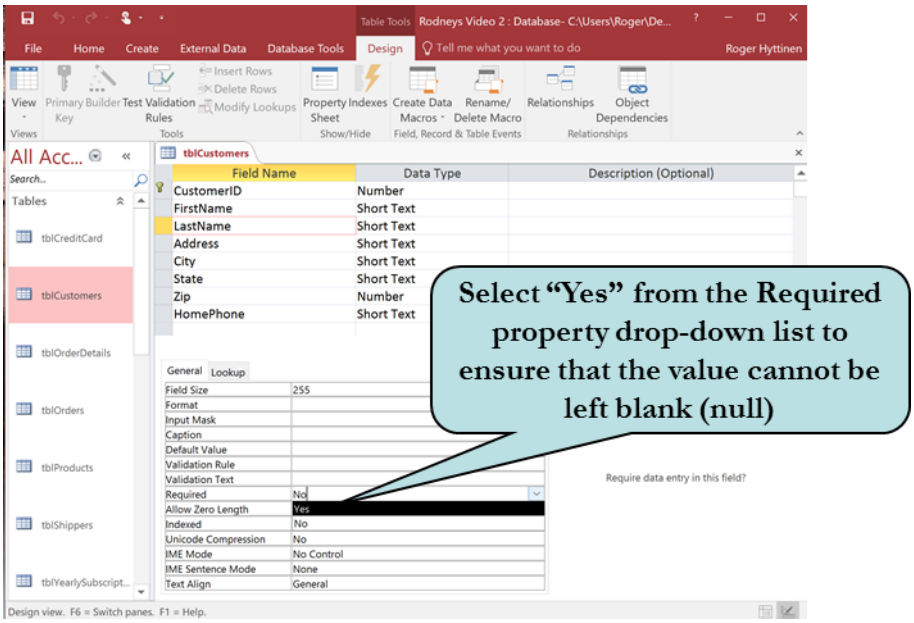


10. Click the Close button on the Indexes dialog box.	Closes the Indexes dialog box.
11. Press the **Ctrl + S** keystroke combination.	Saves our design changes.

2.4 Requiring Data Entry

In this lesson, you will learn how to set the Required field property.

Another common field property is the **Required** property. You can use the Required property to specify whether a value is required in a particular field. If the property is set to **Yes**, the user must enter a value in a field. This is helpful to ensure that essential data is not left out of a record. For example, you might want to make sure that the Last Name field in a Customer Table is never left blank.



To Set the Required Property

1. Open the table in Design View that contains the field you wish to modify.
2. Click anywhere in the row of the field to be changed.
3. Under Field Properties, click in the **Required** box.
4. Click the drop-down arrow and then choose either **Yes** or **No**.

Let's Try It!

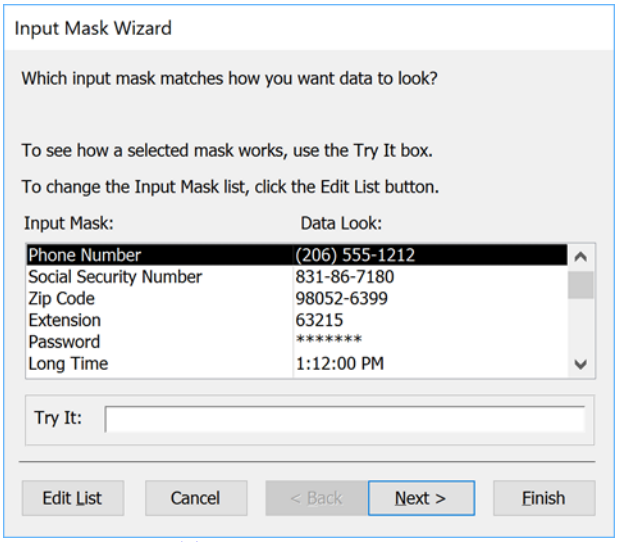
What	Why
1. Click in the Field Name column for the **LastName** field.	Displays the field properties for the LastName field.
2. Under Field Properties, click in the **Required** box.	Activates the Required field property box for the LastName field.
3. Click the arrow in the Required box and select **Yes**.	Sets the property of the LastName field to require a value.
4. Click the **Save** icon on the Quick Access toolbar.	A message box appears asking us if we wish to test the existing data with the new data integrity rules.
5. Click **Yes**.	Tests the data integrity rules and saves our design changes.

2.5 Creating an Input Mask

In this lesson, you will learn how to create an Input Mask for a field.

You can use the **Input Mask** property (for text or date/time data types only) to ensure that data gets entered in the correct format. For instance, you might want the phone number field to be in the format: **(000) 000-0000**. Using an input mask will not only ensure that the data is in a particular format, but it also saves you the trouble of typing certain characters, like parenthesis or hyphens. In the telephone number example, Access would not let you enter a number without an area code nor would it let you save a record that did not contain the required number of characters.

For common types of entries such as phone numbers, social security numbers, dates, or zip codes, use the Input Mask Wizard by clicking on the Build button in the Input Mask property box and then choose one of the available pre-defined Input Masks.



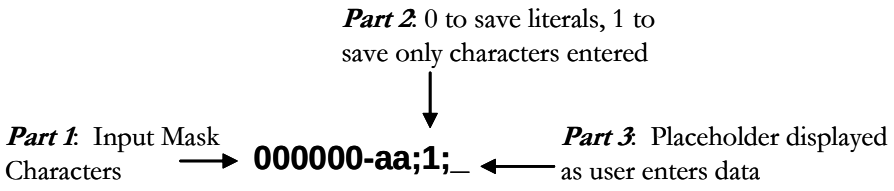
The Input Mask Wizard

For entries not supported by the Input Mask Wizard, you can create your own Input Mask manually. The table below lists the characters available to create a **manual Input Mask**. The Input Mask contains 3 sections, each separate by a semicolon:

1. The mask characters listed in the table below.
2. Enter 1 if you want all literal placeholders to be saved with the data. Enter 0 (or leave blank) to save only the characters in the field.
3. Optional: Enter the placeholder that you want to appear on-screen as the user enters data.

For example, let's say we had an employee number in the following format: ######-##. The first 6 characters are required and must be numbers, and the two characters after

the dash can be letters or numbers and are optional. We also want an underscore (_) as a placeholder. Thus, our manual Input Mask would be entered as 000000-aa;1;_. See the breakdown below.



Input Mask Characters

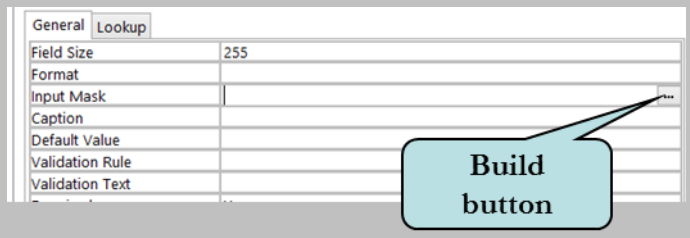
Character	Description
0	Number (0 through 9, entry required; plus and minus signs are not allowed).
9	Number or space (entry optional; plus and minus signs not allowed).
#	Number or space (entry optional; plus and minus signs allowed).
L	Letter (A through Z, entry required).
?	Letter (A through Z, entry optional).
A	Letter or number (entry required).
a	Letter or number (entry optional).
&	Any character or a space (entry required).
C	Any character or a space (entry optional).
. , : ; - /	Decimal placeholder and thousands, date, and time separators.
<	Converts all characters that follow to lowercase.
>	Converts all characters that follow to uppercase.
!	Characters are displayed from right to left, rather than from left to right.
\	Causes the character that follows to be displayed as a literal character (for example, \A is displayed as just A).
Password	Creates a password entry text box. Any character typed in the text box is stored as the character but is displayed as an asterisk (*).

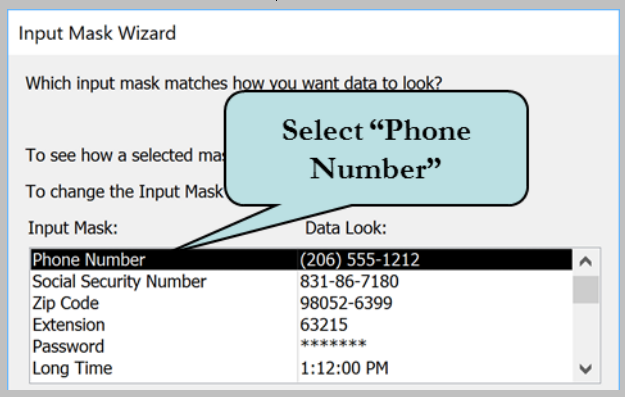
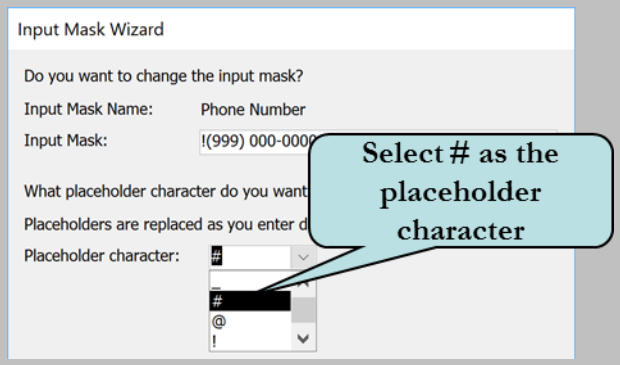
To Create an Input Mask

1. Select the table that contains the field for which you want to create an Input Mask.
2. Switch to **Design View**.
3. Click anywhere in the row of the field to receive the Input Mask.
4. To enter an Input Mask manually, type the desired characters in the Input Mask box in the Field Properties area.
5. To enter an Input Mask using the wizard:
   a. Click in the Input Mask box in the Field Properties area.
   b. Click the **Build button**.
   c. Chose the desired Input Mask from the list box.
   d. Click **Next**.
   e. Make any desired changes to the Input Mask characters or to the placeholder.
   f. Click **Next**.
   g. Select whether to store data with the literals or without the literals.
   h. Click **Finish.**

Let's Try It!

What	Why
1. Click in the Field Name column for the **HomePhone** field.	Displays the field properties for the HomePhone field.
2. Under Field Properties, click in the **Input Mask** box.	Activates the Input Mask field property for the HomePhone field.
3. Click the **Build button** on the right edge of the Input Mask box as shown below. Click **Yes** if asked to save the table.	Launches the Input Mask Wizard.



What	Why
4. Select **Phone Number** from the Input Mask window as shown.	Selects the Input Mask to use.
	
5. Click **Next**.	Moves to the next step of the Wizard.
6. Click the **Placeholder Character** arrow and then select **#** from the drop-down list as shown below.	Selects the placeholder we want use in our Input Mask.
	
7. Click **Next**.	Moves to the next step of the Wizard.
8. Click **Finish**.	As we do not wish to save the literal characters with the data, we will accept the default value.

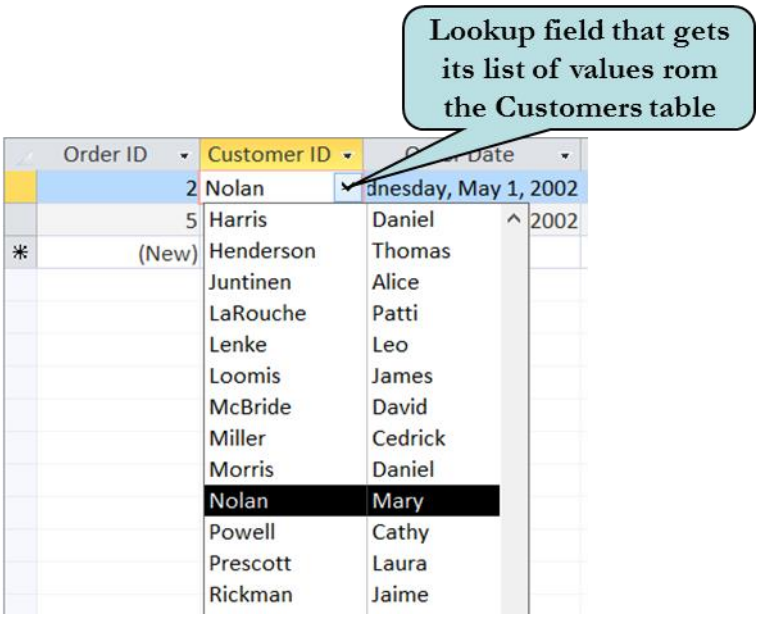
What	Why
9. Click the **Save** icon on the Quick Access Toolbar.	Saves our design changes.
10. Click the **View** button.	Switches to Datasheet View.
11. Click in the **Zip** field for **Jaime Rickman**	Sets the focus in the Zip field.
12. Press **Tab**.	Moves the focus to the HomePhone field.
13. Type: **4045550922**	Enters the phone number without having to enter a parenthesis around the area code or any dashes.
14. Press the **Ctrl + W** keystroke combination..	Closes tblCusotmers.

2.6 Creating a Lookup Field

In this lesson, you will learn how to create a Lookup Field.

Lookup Fields allow you choose the data for a field from a list of values, usually from a query or from another table. Let's say you were entering customer orders. If you remember from the last lesson, only the Customer ID is entered in the Orders table, not the customer's name. So how do you know what Customer ID goes with a particular customer? That's where a lookup field comes in. Using a lookup field, you can get a list of all customer names from the Customers table, and then choose which customer to enter into the orders table. Even though the customer names are displayed in the list, you set up your lookup field so that the Customer ID is stored in the field (in the case of our Orders table, only the Customer ID **can** be stored).

The best thing about creating a Lookup Field is that **the Lookup Wizard** will step you through the process of creating it. The Lookup Wizard is the last option in the Data Type drop-down list. If you have already created relationships, you may have to delete them in order to change the Data Type to the Lookup Wizard. Thus, it is advisable to create the Lookup fields in your table before establishing your relationships.

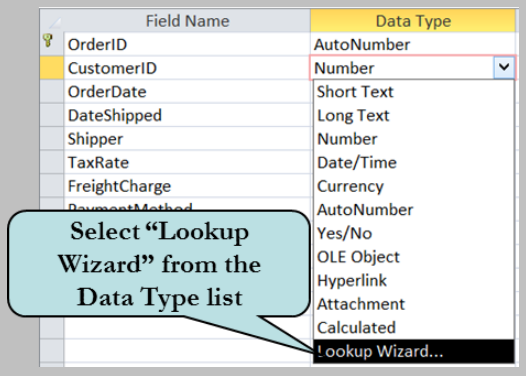


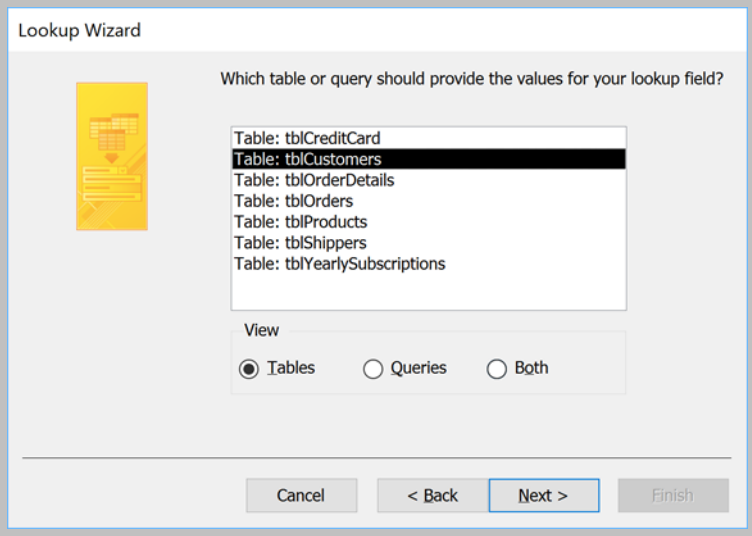
To Create a Lookup List

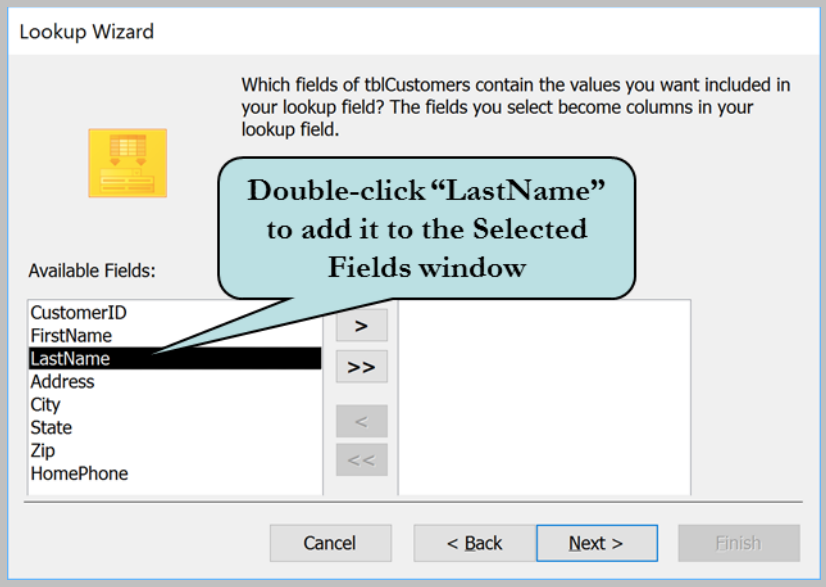
1. Select the table that contains the field to which you want to add a Lookup field.
2. Switch to **Design View**.
3. Click the **Data Type** arrow for the field to receive the Lookup list and then select **Lookup Wizard**.
4. Select the option that indicates you want the Lookup field to look up the values in a table or query.
5. Click **Next**.
6. Choose the table or query from where the lookup data will be retrieved.
7. Choose which field(s) are to be displayed in the Lookup List.
8. Adjust the columns to the desired width. Notice that the **Hide Key Column** is selected. Uncheck this box to display the Primary Key column (which will be the bound column).
9. Click **Next**.
10. Type the desired label for the Lookup column.
11. Click **Finish.**

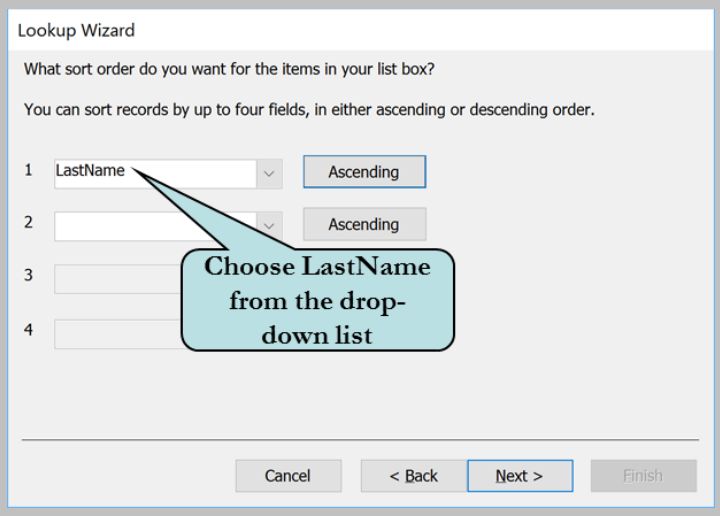
Let's Try It!

What	Why
1. Double-click **tblOrders** and then click the **View** button.	Displays tblOrders in Design View.
2. Click in the **Data Type** column for the **CustomerID** field.	Displays the Data Type arrow.
3. Click the arrow and then select **Lookup Wizard** from the drop-down list as shown below.	Launches the Lookup Wizard.



What	Why
4. Select the option that indicates you want the Lookup field to look up the values in a table or query.	Sets the option for the Lookup field to look up the values in an existing table or query.
5. Click **Next**.	Moves to the next step of the Wizard.
6. Select **tblCustomers** as shown below and then click **Next**.	Selects tblCustomers as the Lookup table (the table from where we will receive our list values) and then moves to the next step of the Wizard.
	
7. Double-click **Last Name** in the Available Fields window as shown below.	Adds the Last Name to the Selected Fields window. These fields will make up the lookup list. We do not need to select the CustomerID field as it is selected automatically but is hidden from view.

What	Why
	
8. Double-click **First Name** in the Available Fields window.	Adds the First Name field to the Selected Fields window.
9. Click **Next**.	Moves to the next step of the Wizard.
10. Click the arrow to the right of the first combo box and select **LastName** as shown below.	You can specify ascending or descending sort order of up to four fields in the Lookup Wizard. This feature is also available in the List Box Wizard and the Combo Box Wizard.

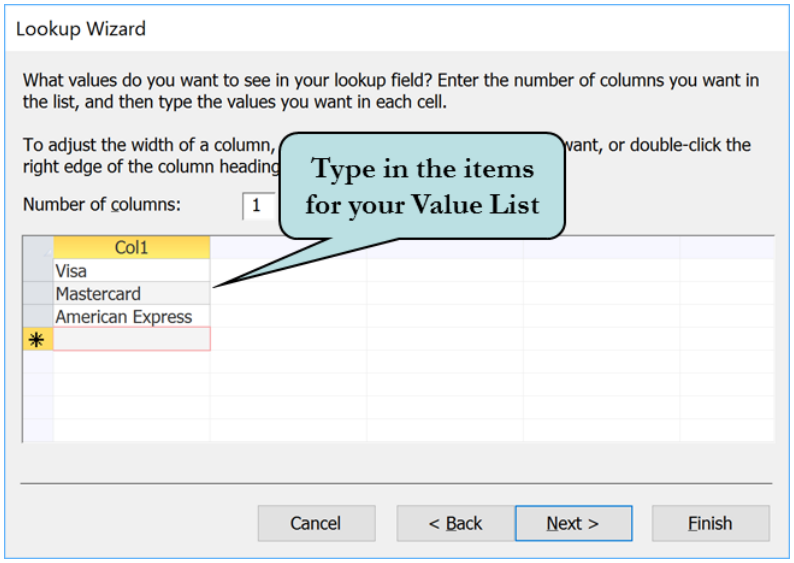
What	Why
	
11. Click **Next.**	Moves to the next step of the Wizard.
12. Click **Next**.	We will keep the default column width and then move to the next step of the Wizard.
13. Click **Finish**.	Completes the Lookup Wizard.
14. When the message displays informing you that the table must be saved before the relationship can be created, click **Yes**.	Saves the design changes of the table.
15. Click the **View** button.	Switches to Datasheet View. Notice that the CustomerID for the first record is displayed as **Nolan**. The actual value in this field is the CustomerID data – it is just hidden from view.
16. Click in the **CustomerID field**. of the first record.	Displays the arrow for the CustomerID field in the first record.
17. Click the arrow and then choose **Cathy Powell** from the drop-down list.	Changes the CustomerID to Cathy Powell for this record.

2.7 Creating a Value List

In this lesson, you will learn how to create a Value List.

A **Value List** is similar to a Lookup field except that instead of looking up the values in another table, you type in the values you want to be displayed. If there are only a few items that need to be displayed in a drop-down list, using a Value List is preferable to creating an entire table to hold just a few values to serve as a Lookup List.

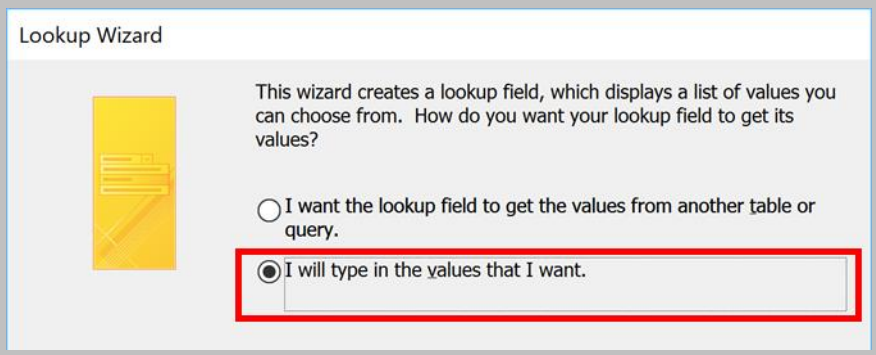
Use the Lookup Wizard to create a Value List just like we did in the last section. However, choose **"I will type in the values that I want'** in the first step of the Wizard, and then manually enter in the items that are to appear in your list.

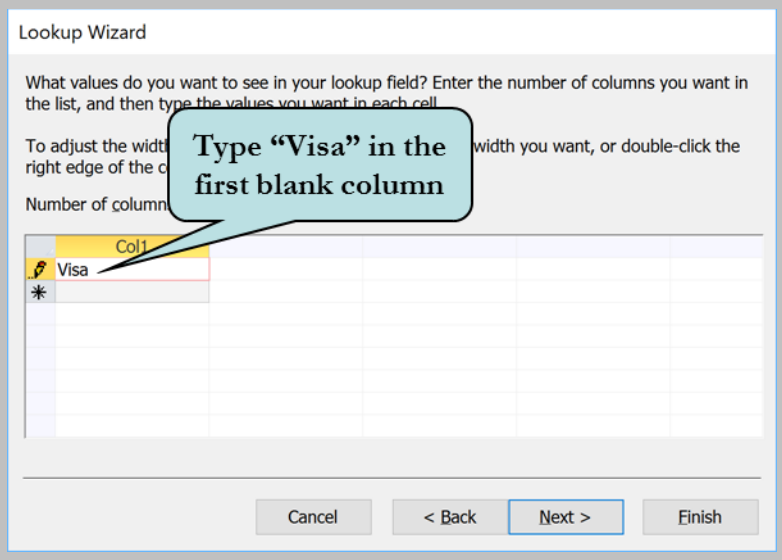


To Create a Value List

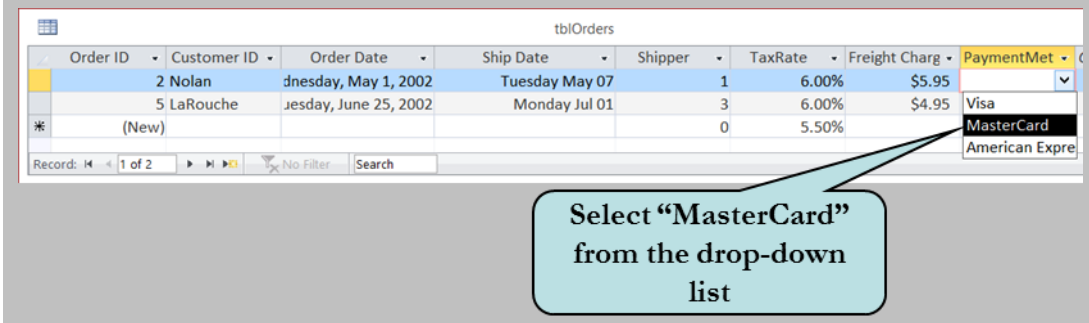
1. Select the table that contains the field to which you want to add a Value List.
2. Switch to **Design View**.
3. Click the **Data Type** arrow for the field to receive the Value list and then select **Lookup Wizard**.
4. Select the option **"I will type in the values that I want"**
5. Click **Next**.
6. Choose the number of columns that are to be displayed in the list.
7. Enter the data in the columns that should appear in your list.
8. Click **Next**.
9. Type the desired label for the Value List.
10. Click **Finish.**

Let's Try It!

What	Why
1. Click the **View** button on the Ribbon.	Displays tblOrders in Design View.
2. Click in the **Data Type** column for the **PaymentMethod** field.	Displays the Data Type arrow.
3. Click the arrow and then select **Lookup Wizard** from the drop-down list.	Launches the Lookup Wizard.
4. Select the option "**I will type in the values that I want"** as shown below.	Sets the option for the Lookup field to get its values from a manually typed list.
	
5. Click **Next**.	Moves to the next step of the Wizard.
6. Click in the first blank column and type: **Visa** as shown below.	Enters the first value of our Value List.

What	Why
	
7. Press the **Tab** key.	Moves to a new row.
8. Type: **MasterCard**	Enters the next value of our Value List.
9. Press the **Tab** key.	Moves to a new row.
10. Type: **American Express**	Enters the next value of our Value List
11. Click **Next**.	Moves to the next step of the Wizard.
12. Click **Finish**.	Completes the Lookup Wizard.
13. Click the **Save** icon on the Quick Access Toolbar.	Saves our design changes.
14. Click the **View** button on the Ribbon.	Switches to Datasheet View.

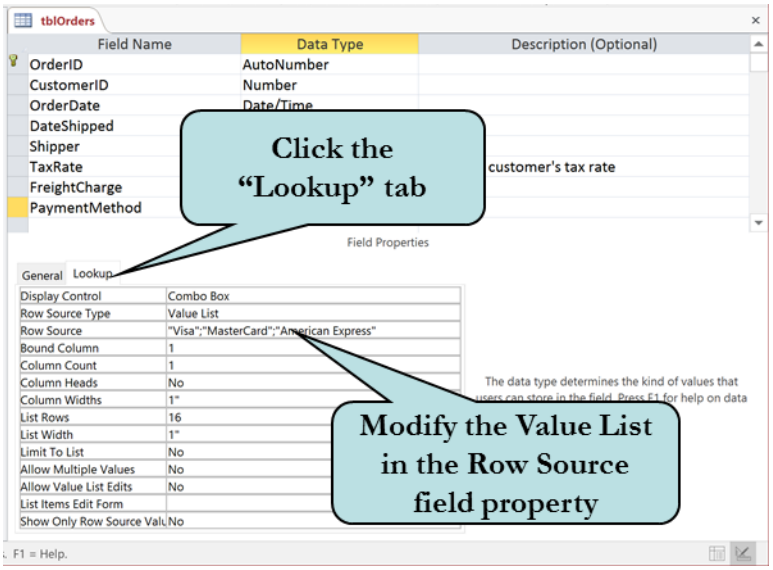
What	Why
15. Click in the **PaymentMethod** field for the first record.	Displays the arrow for the PaymentMethod field.
16. Click the arrow and then select **MasterCard** from the drop-down list as shown below.	Selects "MasterCard" from the Value List. This value will be stored in the PaymentMethod field.



2.8 Modifying a Value List

In this lesson, you will learn how to modify a Value List.

Modifying a Value List is almost as easy as creating one. To modify a value list, click the **Lookup** tab in the field properties for the field whose Value List you wish to modify and then enter the changes in the **Row Source** box. Each entry must be surrounded by quotes and separated from the other entries by a semicolon.



To Modify a Value List

1. Select the table whose value list you wish to modify.
2. Click the **Design View** button.
3. Click anywhere in the row of the field whose value list you wish to modify.
4. Click the **Lookup** tab in the Field Properties area.
5. Click in the **Row Source** box in the Field Properties area.
6. Type your changes.

Let's Try It!

What	Why
1. Click the **View** button on the Ribbon.	Opens tblOrders in Design View.
2. Click in the **Data Type** column for the **PaymentMethod** field.	Displays the Field Properties for the PaymentMethod field.
3. Click the **Lookup tab** under **Field Properties**.	Displays Value List/Lookup List properties.
4. Click in the Row Source box after the words "American Express"	Sets the insertion point in the Row Source box where we are going to add a new Value List entry.
5. Type: **;**	Enters a semicolon. A semicolon is used to separate one value list from another.
6. Type: **"Discover"** as shown below. Make sure that you surround the entry with quotation marks.	Enters a new Value List item.

General | Lookup

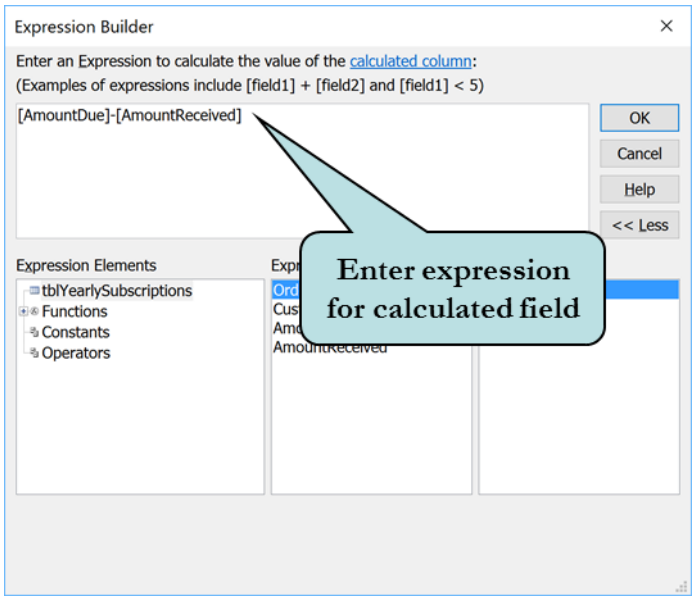
Display Control	Combo Box
Row Source Type	Value List
Row Source	"Visa";"MasterCard";"American Express";"Discover"
Bound Column	1
Column Count	1
Column Heads	No

7. Click the **View** button on the Ribbon. Click **Yes** when asked to save changes.	Saves our design changes and then switches to Datasheet View.
8. Click in the **PaymentMethod** field for the first record.	Displays the arrow for the PaymentMethod field.
9. Click the arrow and then select **Discover** from the drop-down list.	Selects our new Value List item, "Discover", from the Value List.

2.9 Creating Calculated Fields

In this lesson, you will learn how to create a calculated field in a table.

Access allows you to create calculated fields in tables. In older (pre-2010) versions of Access, you could only create calculated expressions on the fly with queries and reports. With the **Calculated** data type, you can now create calculations directly in your tables.

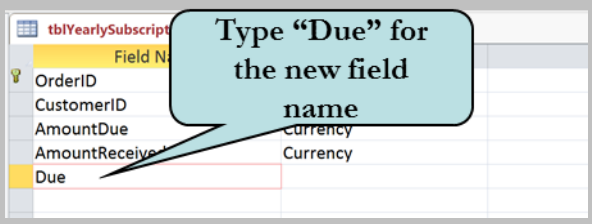


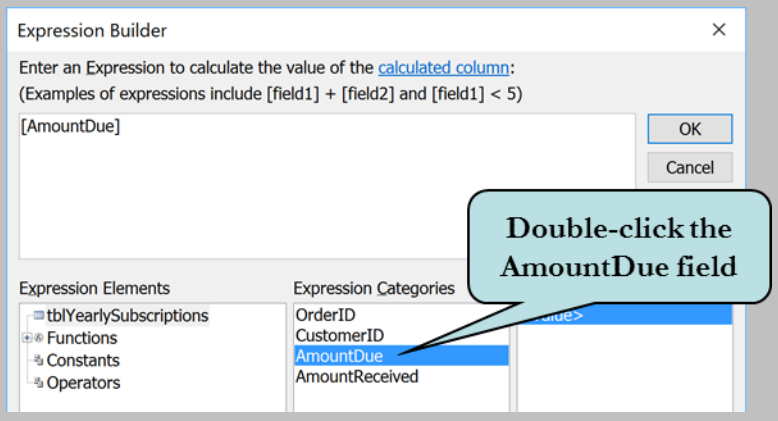
To Create a Calculated Field in a Table

1. Select the table into which you want to create a calculated field.
2. Click the **Design View** button.
3. Click in the first blank row in the Field Name column and type in a name for your new field.
4. Click in the **Data Type** column for the field.
5. Click the drop-down arrow in the Data Type column and choose **Calculated** from the list to display the **Expression Builder** dialog box.
6. In the **Expression Categories** column, double-click the name of the first field you want to add to the calculation.
7. Enter any operators such as +, -, / or *.
8. In the **Expression Categories** column, double-click the name of the second field you want to add to the calculation.
9. Repeat steps 7-8 for any additional fields you want to add to the calculation.
10. When finished, click **OK**.

Tip: To create a calculated field in Datasheet View, click in the first blank column, and click the contextual Fields tab on the Ribbon. Then, click the **More Fields** button on the Ribbon, point to Calculated Field, choose the data type for the fields from the menu and then create your expression.

Let's Try It!

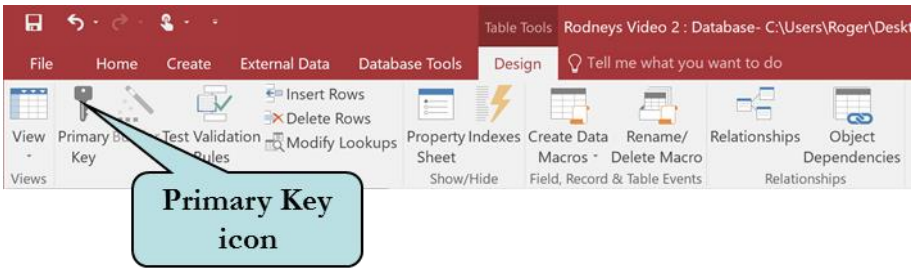
What	Why
1. Click the Close button on tblOrders.	Closes tblOrders.
2. Right-click **tblYearlySubscriptions** and then click **Design View** from the menu.	Displays tblYearlySubscriptions in Design View.
3. Click in the first blank row in the Field Name column and type: **Due** as shown below.	Names the new field Due.
	
4. Press **Tab**.	Moves to the Data Type row.
5. Click the **Data Type** drop-down arrow and choose **Calculated** from the list.	Displays the Expression Builder dialog box
6. Double-click the **AmountDue** field in the Expression Categories window as shown below.	Adds the AmountDue field to the expression window.

What	Why
	
7. Type the **minus (-) symbol** on your keyboard.	Adds a minus symbol to the Expression window.
8. Double-click the **AmountReceived** field in the Expression Categories window. Click **OK**.	Adds the AmountDue field to the expression window and then closes the window.
9. In the Field Properties area, click in the **Format** property box.	Displays the drop-down arrow for the Format property.
10. Click the drop-down arrow and choose **Currency** from the list.	Sets the format of the Due field to currency.
11. Click the **View** button on the Ribbon. Click **Yes** when asked to save the table.	Saves our table changes and switches to Design View. Notice that the Due field automatically calculates the difference between the AmountDue and AmountReceived fields.

2.10 Creating Multiple Primary Keys

In this lesson, you will learn how to create multiple primary keys in a table.

You have already learned that a primary key field prevents the entry of duplicate data in a field. For instance, if the customer number is set as a primary key field, you can only enter each customer number once in that field. However, there are instances where you wish to add more than one primary key field. **Multiple primary keys** prevent the entry of duplicate records of all primary key fields together.



Suppose we have a Student Classes table and we set the Student ID field and the Class ID field as primary key fields. In this case, you could enter duplicate Student ID records and duplicate Class ID records, but not a duplicate of the same Student ID and Class ID **together**. Look at the table below for an example. Smith and Jones can each take more than one class and each class can be taken by more than one student, but neither Smith nor Jones can take the same class more than once.

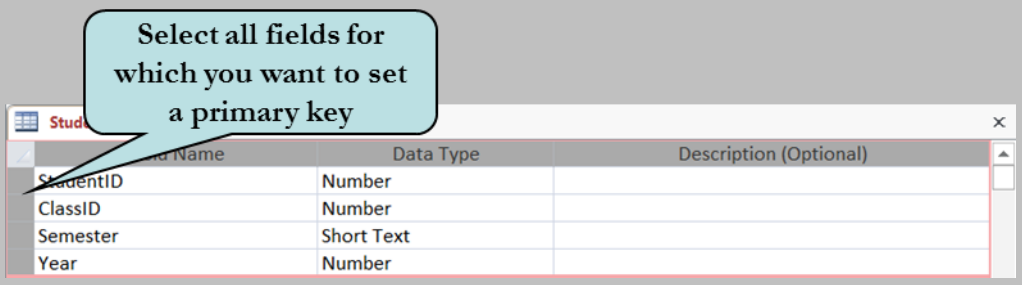
Student ID	Class ID
Smith	French
Smith	History
Jones	English
Jones	French

To Set Multiple Primary Keys

1. Select the table for which you want to set multiple primary keys.
2. Switch to **Design View**.
3. Select the rows that you want to set as primary key fields (**to select non-adjacent rows, hold down the Ctrl key and then select the rows**).
4. Click the **Primary Key** button on the Tools group on the Ribbon.

Let's Try It!

What	Why
1. Click the Close button on tblYearlySubscriptions.	Closes tblYearlySubscriptions.
2. Click the **File tab** on the Ribbon and click **Close**.	Closes the Rodneys Video 2 database and brings you to a blank Access window.
3. Click the **File tab** on the Ribbon and click **Open**.	Displays the Open pane.
4. Click **Browse** in the Center pane.	Displays the Open window.
5. Click **Desktop** in the left pane and then double-click **Lesson Files** in the right pane.	Displays the contents of the Lesson Files folder.
6. Click the **Class Registration 2** file and then click **Open**.	Opens the Class Registration 2 database.
7. Right-click the **StudentClasses** table and then click **Design View**.	Displays StudentClasses in Design View.
8. Move your mouse pointer over the record selector for the **StudentID** field until the cursor transforms into a right-pointing arrow and then click and drag downwards until all fields are selected as shown below.	Selects all fields. To ensure that no duplicate records are entered, we will set multiple primary keys for the StudentID, ClassID, Semester and Year fields.

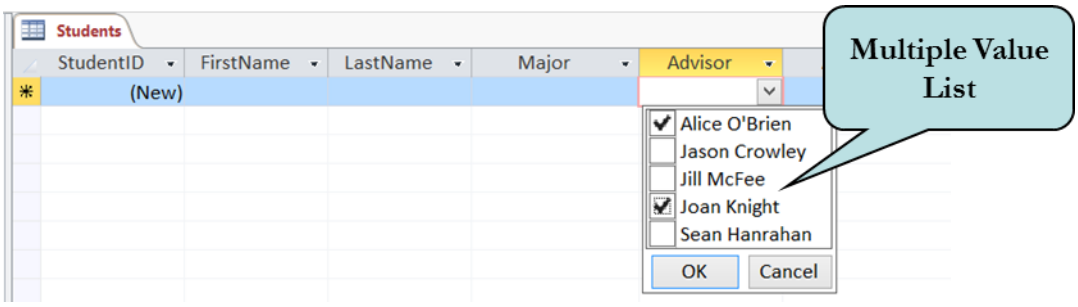


What	Why
9. Click the **Primary Key** icon on the Ribbon.	Sets all selected fields as primary key fields.
10. Click the **View** button on the Ribbon. Click **Yes** when asked if you want to save your changes.	Saves the design changes and then switches to Datasheet View. Observe the records.
11. Double-click in the **ClassID** field for the last record.	Selects the ClassID field for student 45.
12. Type: **34**	Changes the Class ID from 35 to 34.
13. Press the **Up Arrow** key.	You receive an error message because now you would have a duplicate record for all four fields.
14. Click **OK**.	Closes the error message box.
15. Press the **Esc** key.	Restores the original value.
16. Click the **Close button** on the StudentClasses table.	Closes the StudentClasses table.

2.11 Creating Multiple Field Values

In this lesson, you will learn how to create multiple field values in a table.

You have already learned that you can choose an item from a Lookup Field in a table. Access also provides the ability to store multiple values in a field using the Lookup Wizard. For instance, you may want to assign an employee to more than one supervisor or to more than one task. When you click the drop-down arrow on a multi-value field, the value list displays with a check box next to each item, allowing the user to check the value or values they want to store in the field.



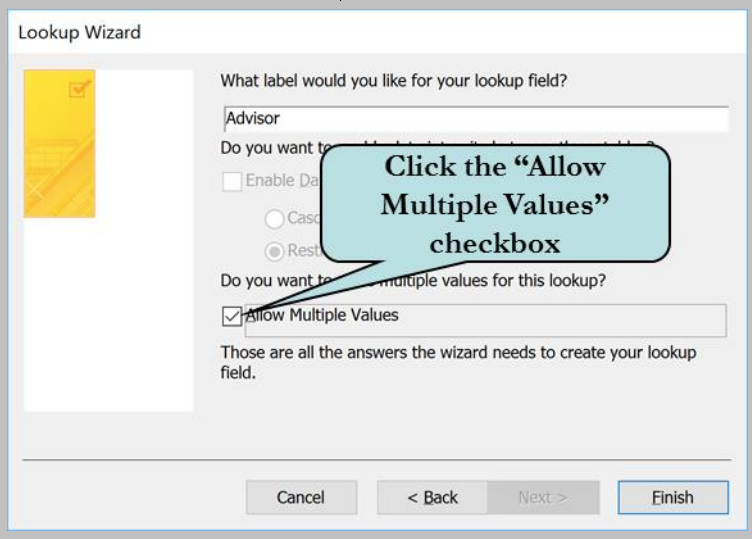
To create a multiple field value, click the Allow Multiple Values check box on the last screen of the Lookup Wizard.

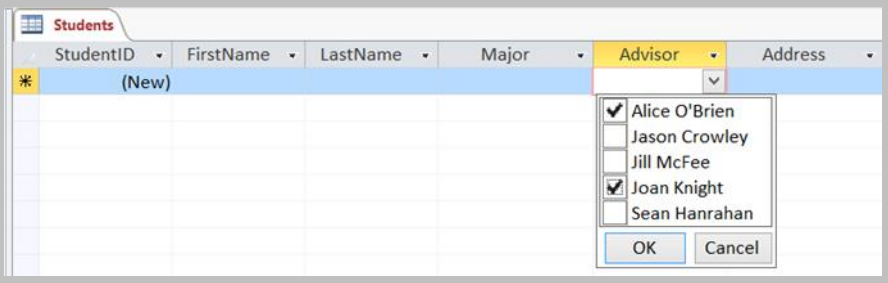
To Create a Lookup List

1. Select the table that contains the field to which you want to add a Lookup field.
2. Switch to **Design View**.
3. Click the **Data Type** arrow for the field to receive the Lookup list and then select **Lookup Wizard**.
4. Click the "I want the Lookup field to look up the values in a table or query" radio button. For a value list, choose "I will type in the values that I want".
5. Select your lookup options – either enter in the values you want or choose the table or query that contain the values you want to use.
6. On the last screen of the wizard, click the **Allow Multiple Values** check box.
7. Click **Finish.**

Let's Try It!

What	Why
1. Double-click the **Students** table and then click the **View** button.	Displays the Students table in Design View.
2. Click in the **Data Type** column for the **Advisor** field.	Displays the Data Type arrow.
3. Click the arrow and then select **Lookup Wizard** from the drop-down list.	Launches the Lookup Wizard.
4. Select the option that indicates you want the Lookup field to look up the values in a table or query.	Sets the option for the Lookup field to look up the values in an existing table or query.
5. Click **Next**.	Moves to the next step of the Wizard.
6. Select **Table: Advisors** and then click **Next**.	Selects the Advisors as the Lookup table (the table from where we will receive our list values) and then moves to the next step of the Wizard.
7. Double-click **Advisor** in the Available Fields window.	Adds the Advisor field to the Selected Fields window. This field will make up the lookup list.
8. Click **Next**.	Moves to the next step of the Wizard.
9. Click the arrow to the right of the first combo box and select **Advisor**.	Specifies that the list will be sorted in ascending order by the advisor field.
10. Click **Next.**	Moves to the next step of the Wizard.
11. Click **Next**.	We will keep the default column width and then move to the next step of the Wizard.

What	Why
12. Click the **Allow Multiple Values** check box as shown below.	Allows the user to choose more than one value from the value list.
	
13. Click **Finish**.	Completes the Lookup Wizard.
14. When the message displays informing you that you will not be able to under this action, click **Yes**.	Closes the message box.
15. When the message displays informing you that the table must be saved before the relationship can be created, click **Yes**.	Saves the design changes of the table.
16. Click the **View** icon.	Switches to Datasheet View.
17. Click in the **Advisor field** of the first record.	Displays the arrow for Advisor in the first record.

What	Why
18. Click the arrow and then click the check box next to **Alice O'Brien** and **Joan Knight** from the drop-down list as shown below.	Selects both values to be stored in the field.
	
19. Click **OK**.	Closes the multiple field values list.
20. **Double-click the right border** of the **Advisor** column.	Expands the column to accommodate the data.
21. Click the **Close button** on the Students table. Click **Yes** when asked to save your changes.	Saves and closes the Students table.
22. Click the **File tab** on the Ribbon and click **Close** from the File Options menu.	Closes the database.

Lesson Summary – Working with Tables

- In this Lesson, you learned how to set a validation rule - a property that defines valid input entries for a field in a table. You learned that when in Design View, you can either type in the rule directly in the Validation Rule box under Field Properties or use the expression builder.
- Next, you learned how to use the Format property of a field to change how data is displayed in your screen. You learned that Access has several pre-defined formats that you can use in addition to the custom formats you can enter. To change the formatting of fields, click the Format box under Field Properties in table Design View and select the format you want from the list.
- Next, you learned about Indexes, which enable Access to find and sort records more quickly. It is a good idea to index fields in which you frequently search for data or fields that you sort by in queries. To index a field, click the arrow in the Indexed box under Field Properties in table Design View and then choose the desired Index option from the drop-down list.
- Next, you learned how to require data entry in a field by setting the Required property to Yes. This specifies that the field cannot be left empty. To set the Required property, click in the Required box under Field Properties, click the drop-down arrow and choose either Yes or No.
- Next, you used the Input Mask property (for text or date/time data types only) to ensure that data gets entered in the correct format. Using an input mask not only ensures that the data is in a particular format, but it also saves you the trouble of typing in certain characters, like parenthesis or hyphens. To set an Input Mask, click in the Input Mask box in the Field Properties area, click the Build button and select the desired Input Mask from the list box.
- Next, you learned how to add a lookup field to your table, which allows you choose the data for a field from a list of values, usually from a query or from another table, using the Lookup Wizard. To add a lookup field, click the Data Type arrow for the field to receive the lookup list, click Lookup Wizard and follow the instructions of the Wizard.
- Next, you learned that a Value List is similar to a Lookup field except instead of looking up the values in another table, you type in the values you want to be displayed. To add a lookup field, click the Data Type arrow for the field to receive the lookup list, click Lookup Wizard, click "I will type in the values I want", enter the values you want to be displayed and follow the rest of the instructions of the Wizard.

- Next, you learned how to modify a value list, by clicking the Lookup tab in the Field Properties box for the field whose Value List you wish to modify and then entering the changes in the Row Source box. Each entry is surrounded by quotes and separated from the other entries by a semicolon.
- Next, you learned how to add a calculated field to a table using the Calculated data type. This allows you to store the calculation of two or more fields in your table. To create a calculated field, click the drop-down arrow in the Data Type column, choose Calculated from the list to display the Expression Builder dialog box and then type in the calculation in the Expression Builder window.
- Next, you learned how to enter Multiple Primary keys, which prevent the entry of duplicate records of all primary key fields together.
- Lastly, you learned that Access has the ability to store multiple values in a field using the Lookup Wizard. When you click the drop-down arrow on a multi-value field, the value list displays with a check box next to each item, allowing the user to check the value or values they want to store in the field. To create a multiple field value, click the Allow Multiple Values check box on the last screen of the Lookup Wizard.

Lesson 2 Quiz

1. To restrict entry in a record to specific criteria, you would set:
   A. An Input Mask
   B. A field Validation Rule
   C. A field Criteria Rule
   D. A field Index

2. In addition to Access' predefined formats, you can enter custom formats in the Field Properties Format box.
   A. True
   B. False

3. What is a field index?
   A. A rule that restricts data entry to a specific criteria.
   B. A field data type
   C. A setting that specifies that the field cannot be empty (null).
   D. A setting which enables Access to find and sort records more quickly.

4. What are the three available index settings?

5. You want the date in your Date field to display in the format: 05/02/2013. What Format setting would accomplish this?

   A. m/d/yyyy
   B. mmm dd yyyy
   C. mm/dd/yyyy
   D. m/d/yy

6. To ensure that a field cannot be empty (or NULL), you would set the _____ property to Yes (fill in the blank).

7. When entering data into a table, you want the user to be able to select from a list of values retrieved from another table. To accomplish this, you would add what to the field?
   A. A Lookup List
   B. An Indexed List
   C. A Value List
   D. A Memo List

8. To add a value list to a field, you would click the Data Type arrow for the field for which you want to add the list and then choose _____ (fill in the blank) from the Data Type list.

9. Once you create a value list, it cannot be edited so you must plan it out ahead of time.
   A. True
   B. False

10. When might you want to add more than one Primary Key to a table?
   A. If you want to sort by more than one field.
   B. You want to prevent duplicate values in any fields that contain a Primary Key.
   C. You want to allow the user to be able to add more than one item to a field.
   D. You want to prevent the entry of duplicate records of all Primary Key fields together.

11. How can you force the data in a field to display in all capital letters?

12. You want to ensure that the data in your telephone number field contains no spaces, hyphens or parenthesis. What property can you set to accomplish this?
   A. Text Only Property
   B. Caption Property
   C. Input Mask
   D. Validation Rule

LAB 2 – ON YOUR OWN

1. Open the **Lab2** database in the Lesson Files folder.

2. Open the tblStudents table in Design view. Set a validation rule for the **StudentID** field ensuring that the entry is **greater than 90000000** (all Student ID numbers begin with 9 and have 7 digits after the 9). Set the validation text to read: "**Entry must be greater than 90000000!"** Click the Save icon on the Quick Access toolbar. Click **Yes** to have Access check to ensure that existing data is valid for the validation rule.

3. Set the **FirstName** and **LastName** fields to be indexed, allowing duplicates.

4. Using the **Input Mask Wizard**, create an Input Mask for the **Phone** field. Use the Phone Number template. Choose **#** as the placeholder. Have Access store the data without the symbols. **Save** and **close** the tblStudents table.

5. Open tblStudentClasses in Design View. Launch the **Lookup Wizard** for the **ClassID** field (Hint: click the arrow in the Data Type field and then choose the last option, **Lookup Wizard**.). Choose the option to look up values in a table or query and choose the t**blClasses** table. Choose the **ClassName** field as the field to be displayed in the list and sort ascending by ClassName. Make sure the key column is hidden. Switch to Datasheet View and click the arrow in the ClassID field for the first record. Choose **Art 100** from the list (you may have to widen the column so all class names are visible).

6. Switch to Design View and then create a **Value List** for the **Semester** field (Hint: Launch the Lookup Wizard and then choose "I will type in the values I want"). Enter the following values for the Value List: **Spring, Summer, Fall** and then click Finish. Switch to Datasheet View and then click the arrow in the Semester field for the last record. Choose **Spring** from the drop-down list.

7. Close tblStudentClasses.

8. Close the Lab2 database.

Lesson 3

Lesson 3 - Working with Queries

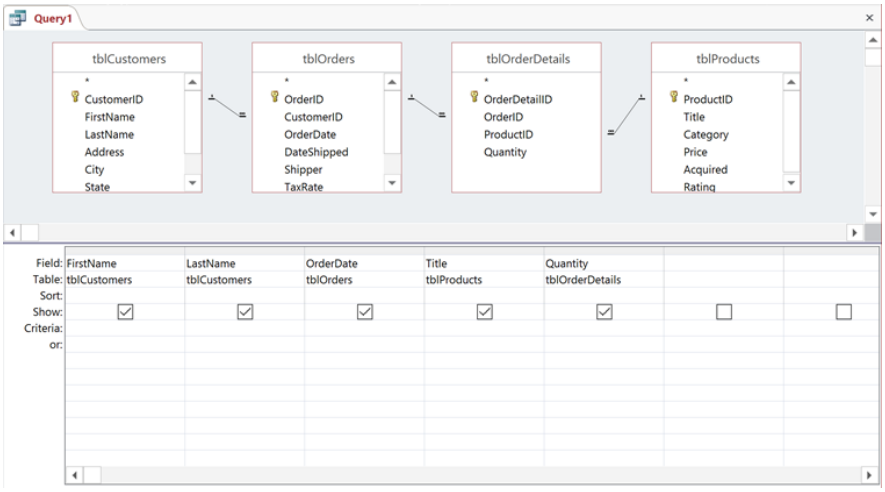
Lesson Topics:

3.1 Creating Multi-Table Queries

In this lesson, you will learn how to create a query using more than one table.

A **multi-table query** is a query that retrieves information from more than one related table. When adding tables to your query, Access automatically creates the joins between your tables, assuming that you have set up your relationships beforehand.

Once you have chosen the tables you want included in your query and the joins have been created, select which fields to add to the query grid and then specify any desired criteria.

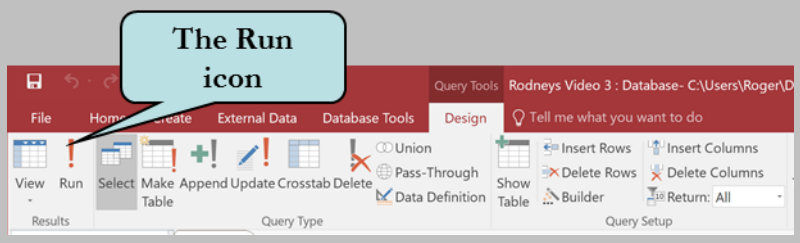


To Create a Multi-Table Query in Design View

1. Click the **Create tab** on the Ribbon.
2. Click the **Query Design button** on the Queries group of the Ribbon.
3. Click the **Tables** tab if necessary.
4. Select the first table upon which you want to base your query and then click the **Add** button.
5. Repeat step 4 until all desired tables have been added.
6. Click **Close** when finished.
7. Add the desired field to the query grid by:
   Double-clicking the field name in the field list box
   Or
   Clicking and dragging the field from the field list box to the design grid
   Or
   Clicking the field row and then choosing the desired field from the drop-down list.

Let's Try It!

What	Why
1. Click the **File** tab and then click **Open** from Backstage view.	Displays the Open dialog box.
2. Click the **Browse** icon in the center pane.	Displays the Open dialog box.
3. Click **Desktop** on the left side of your screen.	Displays the Desktop folder.
4. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
5. Select the **Rodneys Video 3** file and then click **Open**.	Opens the Rodneys Video 3 database.
6. Click the **Create tab** on the Ribbon.	Switches to Create commands and tools.
7. Click the **Query Design button** on the Queries tab of the Ribbon.	Displays the Show Table dialog box.
8. Select **tblCustomers** and then click **Add**.	Adds tblCustomers to the query.
9. Select **tblOrders** and then click **Add**.	Adds tblOrders to the query.
10. Select **tblOrderDetails** and then click **Add**.	Adds tblOrderDetails to the query.
11. Select **tblProducts** and then click **Add**.	Adds tblProducts to the query.
12. Click the **Close** button.	Closes the Show Table dialog box.

What	Why
13. Double-click the following fields to add them to the query grid: **FirstName (tblCustomers)** **LastName (tblCustomers)** **OrderDate (tblOrders)** **Title (tblProducts)** **Quantity (tblOrderDetails)**	Adds the selected fields to the query grid.
14. Click the **Save** button on the Quick Access Toolbar and then type: **qryCustomerOrders** in the Query Name box.	Provides a name for our query.
15. Click **OK**.	Saves the query.
16. Click the **Run button** on the Results group as shown below and observe the results.	Displays the results of our query.
	
17. Click the **View** button.	Switches to Design View.

3.2 Using Calculations in Queries

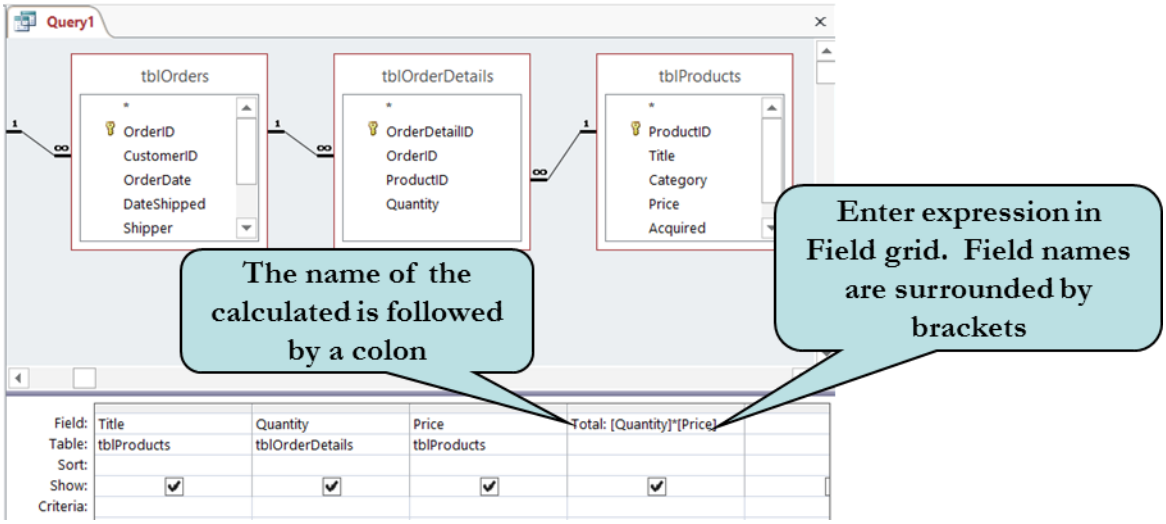
In this lesson, you will learn how to create calculations in queries.

When creating a database, you normally would not create a field in a table that could be calculated on the fly. For instance, in an Orders database you would rarely see a Total field in a table with hard-coded data as this can be easily calculated in a query, form or report by means of a **Calculated Field** (beginning with Access 2010, Calculated Fields are now available in tables as well). Calculated fields are completely new fields typically found in a query, form or report that perform arithmetic on fields to return information that is not contained elsewhere in your database. Most calculated fields contain an operator such as +, -, / or * and are used for values that are not a part of your database and/or values that can change over time.

For instance, to calculate the Line Total in an order database, you might enter the expression (or formula):

Total: [Quantity] * [Price]

In the above example, the new field that will display the results of the calculation is named **Total**. The desired name of the new field, followed by a colon (:), precedes the expression. When creating a calculated field, enter the field names that are part of the calculation in **brackets**. This tells Access that the field is part of a calculation.

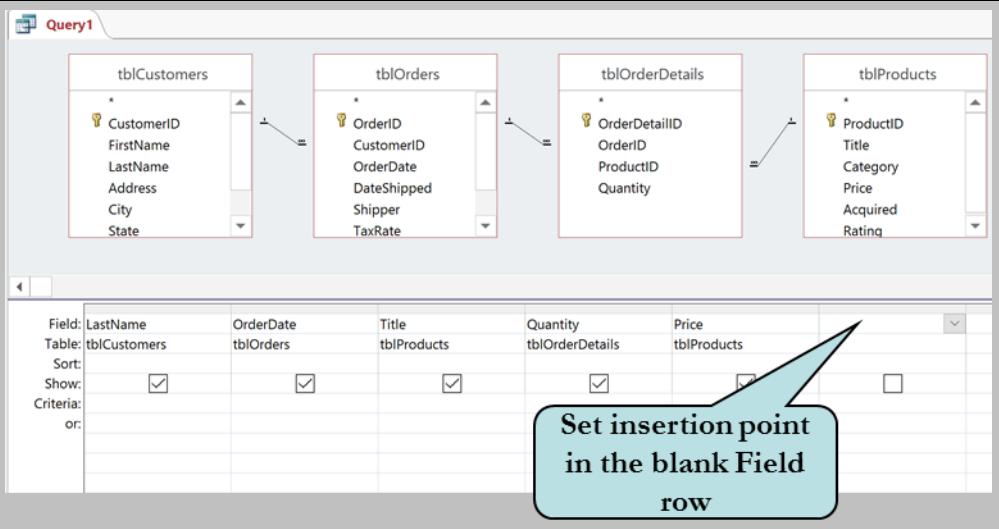


To Create a Calculated Field in a Query

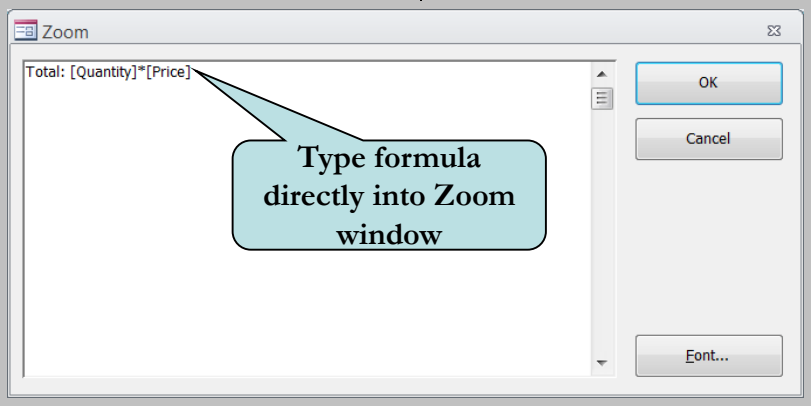
1. Open the query in Design View.
2. Click in the first blank **Field Row**.
3. Type a unique name for the calculated field, followed by a colon (:).
4. Type in your formula, surrounding field names with brackets.

Let's Try It!

What	Why
1. Double-click the **Price** field in the **tblProducts** field list.	Adds the Price field to the query grid.
2. Click in the first blank **Field Row** to the right of the Price column.	Sets the insertion point where we wish to enter our formula.



3.	Press the key combination **Shift + F2**. If the Zoom windows does not display, you may need to turn off the F-Lock on your keyboard.	Opens the Zoom window. While you can type your formula directly into the cell, using the Zoom window allows you to view your entire formula much easier.

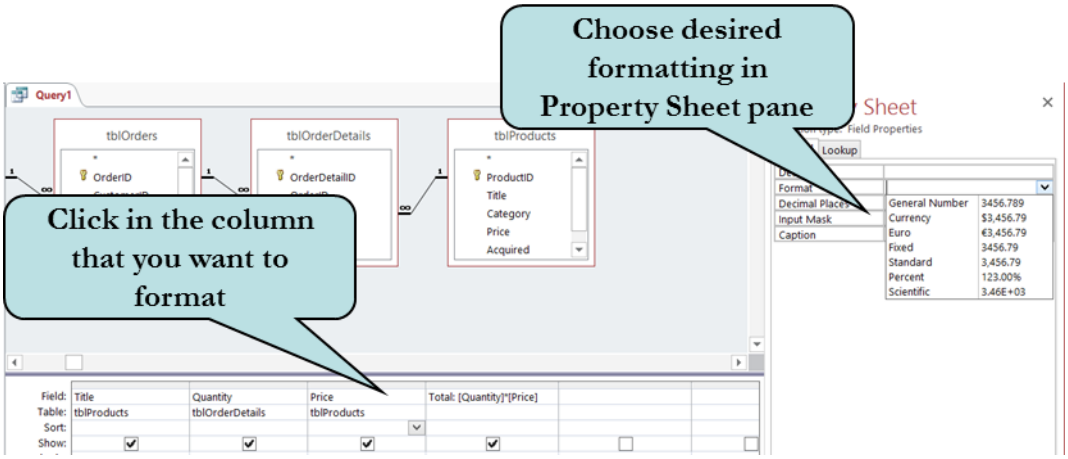


4.	Type: **Total:**	Enters the name for our calculated field.
5.	Type: **[Quantity] * [Price]**	Enters the calculation. Notice that each field name is surrounded by brackets but the operator is not.
6.	Click **OK**.	Closes the zoom window and places the expression in the cell.
7.	Click the **Save** button on the Quick Access Toolbar.	Displays the Save As box.
8.	Type: **qryCustomerOrders** in the Save As box and then click **OK**.	Provides a name for our query and then saves it.
9.	Click the **Run** icon.	Runs the query. Our new Total field is included in the recordset.

3.3 Changing Query Properties

In this lesson, you will learn how to modify field properties of your query.

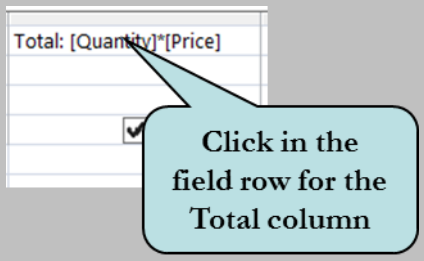
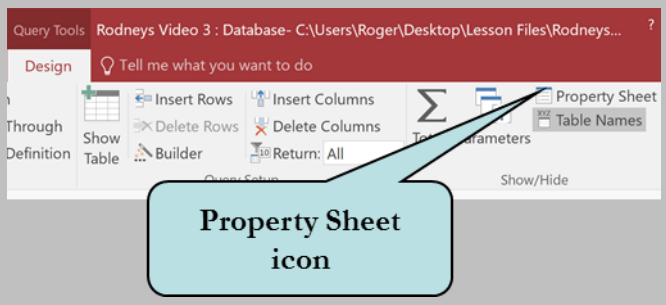
Notice that when we ran the query in the last lesson, the new Total field did not contain the currency symbol whereas the Price field does. Just as you are able to modify the properties of fields in tables, you can also modify how the data in the query fields is displayed as well. To do this, click anywhere in the column whose data you wish to format, right-click and then select **Properties** from the pop-up menu or click the **Property Sheet button** on the Show/Hide group of the Ribbon. You can then make the desired formatting changes in the Property Sheet Pane.



To Modify Field Properties in a Query

1. Click anywhere in the column whose formatting you wish to change.
2. **Right-click** and then choose **Properties** from the pop-up menu.
   Or
   Click the **Property Sheet** button on the Show/Hide group on the Ribbon.
3. Make the desired formatting in the Property Sheet Pane.

Let's Try It!

What	Why
1. Click the **View** button on the Ribbon.	Switches to Design View.
2. Click in the Field name row for the **Total column** as shown.	Selects the Total field. 
3. **Click** the **Property Sheet** on the Show/Hide group on the Ribbon as shown below.	Displays the Property Sheet Pane.
	
4. Click in the **Format Box**.	Sets the insertion point in the Format properties box.
5. Click the arrow and then select **Currency** from the drop-down list.	Sets the format of the selected cell to a currency data type.
6. Click the **Close button** on the Property Sheet Pane.	Closes the Property Sheet Pane.
7. Click the **Save** icon on the Quick Access Toolbar.	Saves the design changes.

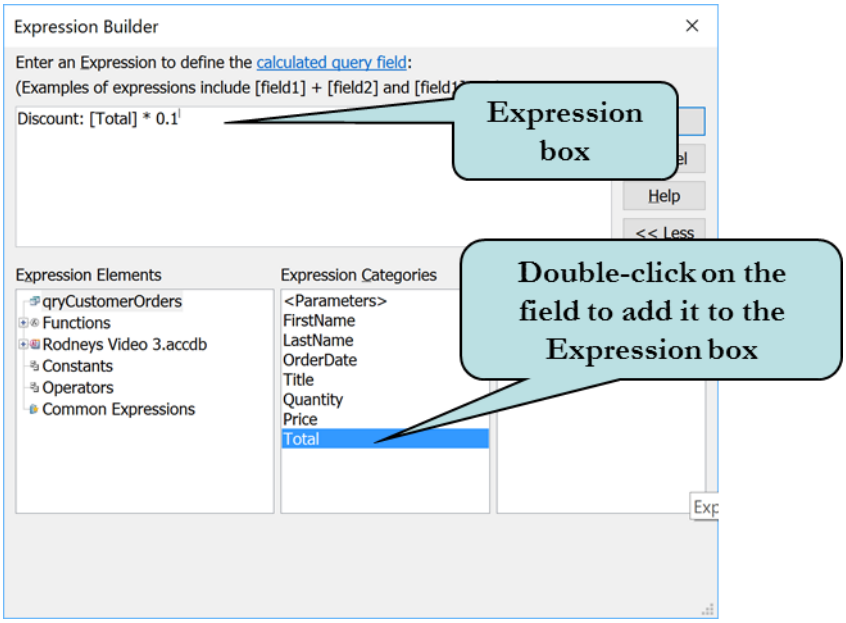
What	Why
8. Click the **Run** icon.	Displays the results. The data in the Total field is now preceded by a currency symbol.

3.4 Working with the Expression Builder

In this lesson, you will learn how to create calculated fields using the Expression Builder.

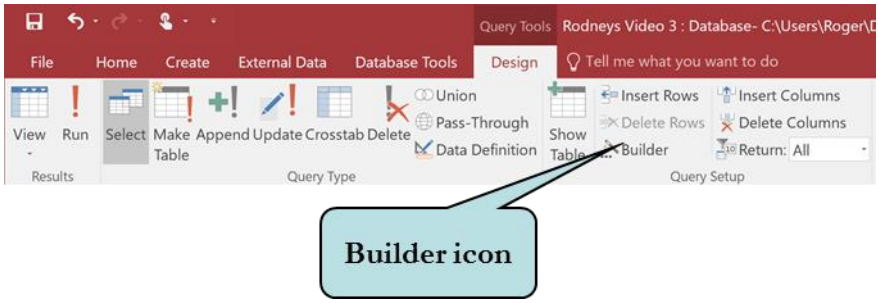
If you would rather not type in your expressions manually or are unsure of how to write an expression, Access provides a tool called the **Expression Builder** that helps you to build the expression that you need. The Expression Builder allows you to pick the fields from various tables and/or queries, operators or even choose from built-in functions for your expressions.

To launch the Expression Builder, click in the field for you which you wish to create an expression, and then click the **Builder** button on the Ribbon.



To Create a Calculated Field in a Query using the Expression Builder

1. Open the query in Design View.
2. Click in the first blank **Field Row**.
3. Click the **Builder icon** on the Query Setup group on the Ribbon.

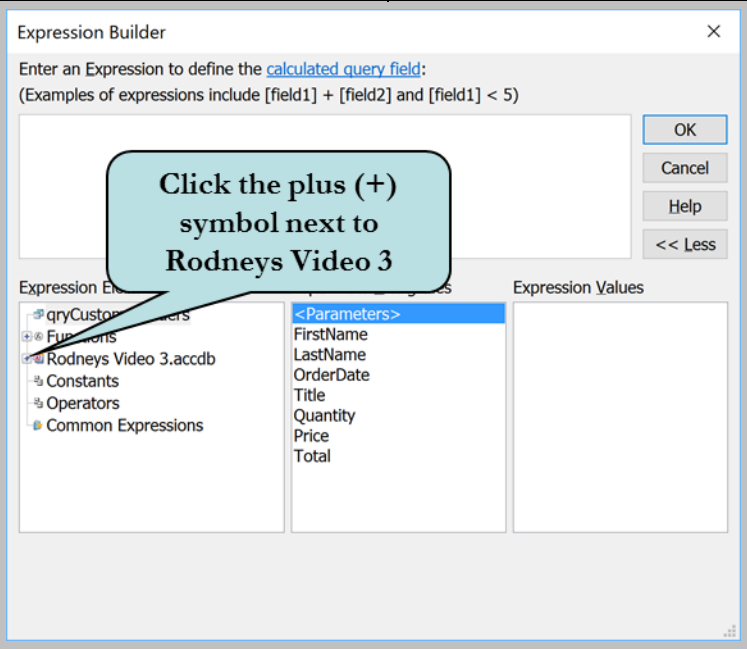


4. Type a unique name for the calculated field, followed by a colon in the expression window.
5. Click Tables to list all tables in the database or Queries to list all Queries in the database.
6. Double-click a field to add it to the expression window.
7. To add an operator to the expression window, click the desired operator button.
8. Type in any extra desired values.
9. Click **OK** when finished.

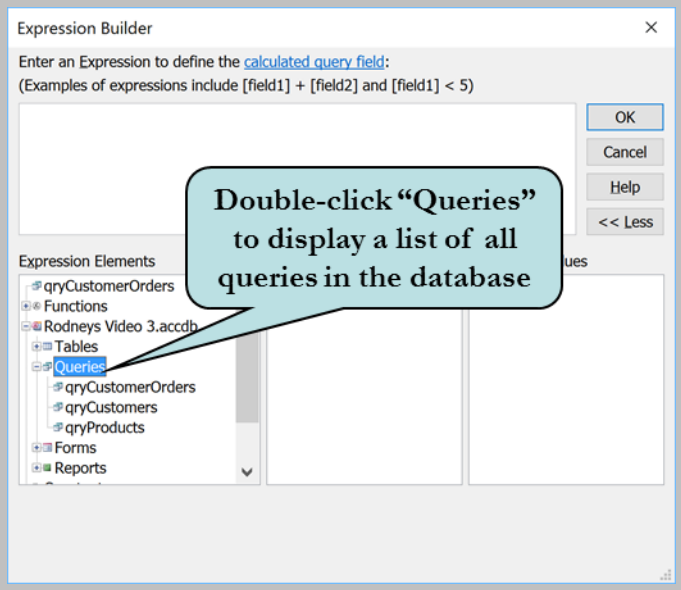
Let's Try It!

What	Why
1. Click the **View** button.	Switches to Design View.
2. Click in the **Field row** of the first blank column to the right of the Total column.	Sets the insertion point where we wish to enter our formula.
3. Click the **Builder** icon on the Query Setup group on the Ribbon.	Opens the Expression Builder box.
4. If necessary, click the **plus (+) symbol** next to Rodneys Video 3.accdb in the first window on the left as shown below.	Displays a list of all of the objects in the database.

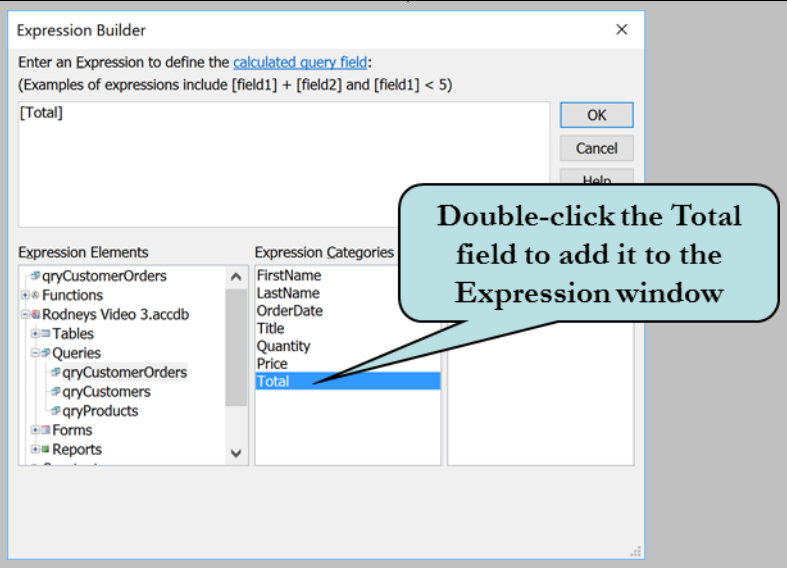
What	Why



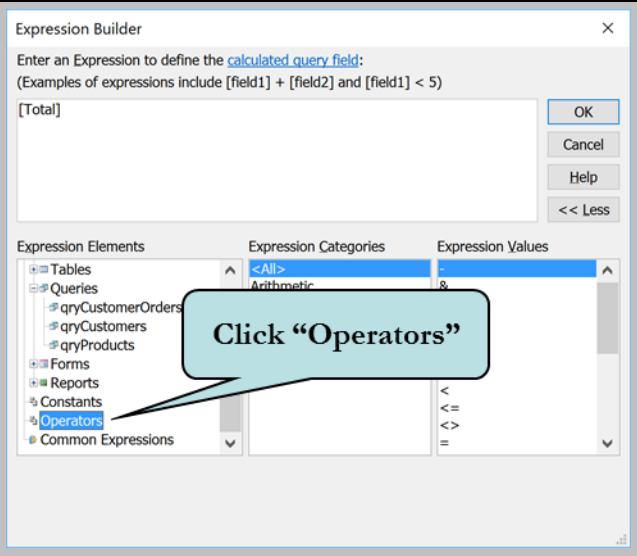
5. Double-click the word **Queries** in the first window on the left as shown below.	Displays a list of all queries in the database. You can double-click an item name as well as clicking the plus symbol to expand that item.



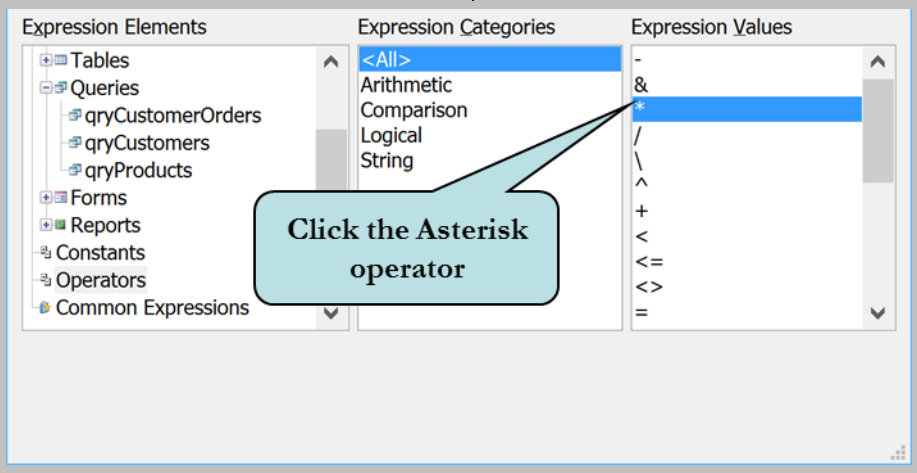
What	Why
6. Click **qryCustomerOrders** in the left window.	Displays a list of all the fields in the qryCustomerOrders query.
7. Double-click **Total** in the middle window as shown below.	Adds the Total field to the Expression Window.



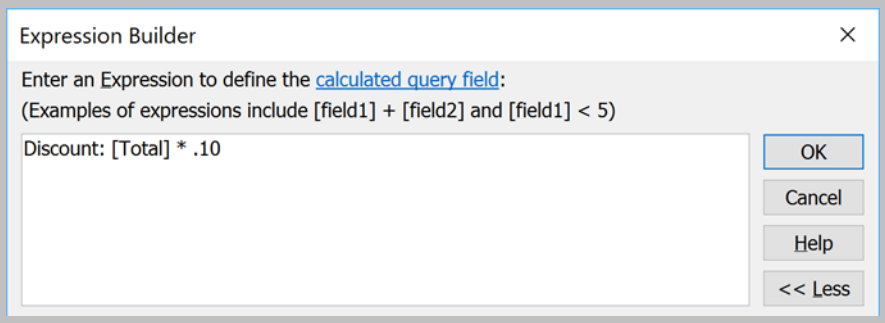
8. Click **Operators** in the left pane as shown below.	Displays a list of common mathematical operators.



What	Why
9. Double-click the asterisk (*****) operator in the right pane as shown below.	Adds the multiplication symbol to the Expression Window.



10. Type: **.10**	Enters a value of .10 after the multiplication symbol.
11. Press the **Home** key on your keyboard.	Moves to the beginning of the line. We now want to type a name for our new field.
12. Type: **Discount:** and then press the **Spacebar**. Your expression should be identical to the example below.	Enters a name for our field. We now have created a new field which calculates a 10% discount on each line item total.



13. Click **OK**.	Closes the Expression Builder box.

What	Why
14. Click the **Run** button and click **Save** when asked to save your changes. Observe the new field.	Runs the query. Our new calculated field, Discount uses another calculated field (Total) in its calculation in order to compute the discount of the total of each line item.
15. Click the **View** button on the Ribbon.	Switches to Design View.
16. Click in the **Field row** of the first blank column to the right of the Discount column.	Sets the insertion point where we wish to enter a new formula.
17. Type: **New Total:**	Enter a name for our new field.
18. Type: **[Total] – [Discount]**	Calculates the new total based on a 10% discount on the original total.
19. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.
20. Click the **Run** button and observe the new field.	Runs the query. Our new calculated field, New Total, subtracts the discount amount from the original total field.
21. Click the **View** button on the Ribbon.	Switches to Design View.
22. Click in the **Discount** field and then click the **Property Sheet button** on the Ribbon.	Displays the Property Sheet for the Discount field.
23. Click in the **Format box** and then select **Currency** from the drop-down list.	Sets Currency as the data type.
24. Click in the **Decimal Places** box and type: **2**	Sets the number of decimal places to 2.

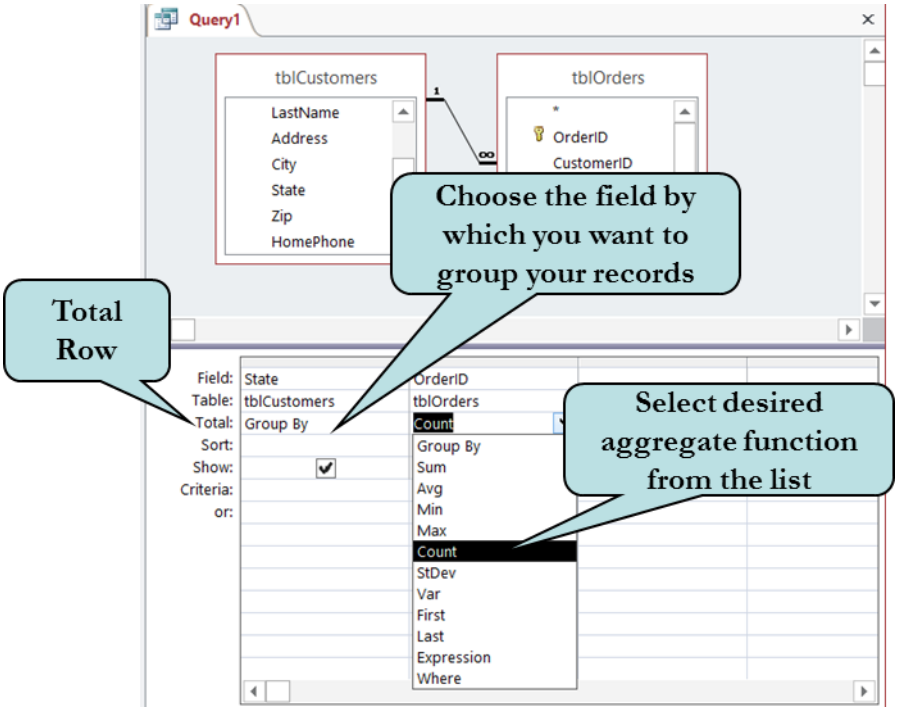
What	Why
25. Click the **Close button** on the Property Sheet window.	Closes the Property Sheet window.
26. Click in the **New Total** field and then click the **Property Sheet button** on the Ribbon.	Displays the Property Sheet for the New Total field.
27. Click in the **Format box** and then select **Currency** from the drop-down list.	Sets Currency as the data type.
28. Click in the **Decimal Places** box and type: **2**	Sets the number of decimal places to 2.
29. Click the **Close button** on the Property Sheet window.	Closes the Property Sheet window.
30. Click the **Run** button and observe the changes.	Runs the query. The Discount and New Total fields are now formatted as currency with two decimal places.
31. Click the Close button on the query window. Save any changes.	Saves and closes the query.

3.5 Creating a Totals Query

In this lesson, you will learn how to perform calculations on groups of records.

When working with a database, you will inevitably need to summarize information for a group of records, rather than working with individual records. For example, you might need to know the total amount of sales by each state or perhaps which customers spent more than $200. You can accomplish this be creating a **Totals Query**. To create a Totals Query, add a **Total** row to your query by clicking the **Totals Button** or by right-clicking and selecting **Totals** from the contextual menu.

The Totals Row allows you to choose the way each group of records is to be summarized. Access provides several **Aggregate Functions** from which to choose. These are listed in the table below.



To Create a Totals Query

1. Create a new query in design view.
2. Add the field(s) by which you to group your records to the grid.
3. Add the field to which you want to apply an aggregate function (such as sum) to the grid.

4. Click the **Totals Button** on the Show/Hide group to display the Total row.

Or

Right-click and choose **Totals** from the contextual menu.

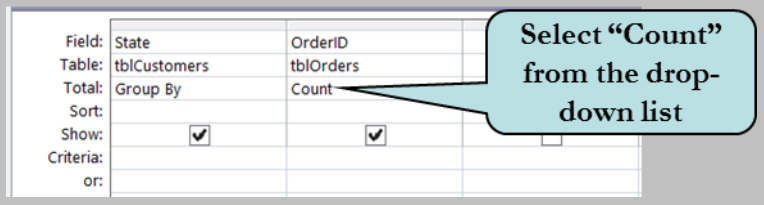
5. Click in the **Total** row for the field you wish to calculate.
6. Select the desired aggregate function from the drop-down list.

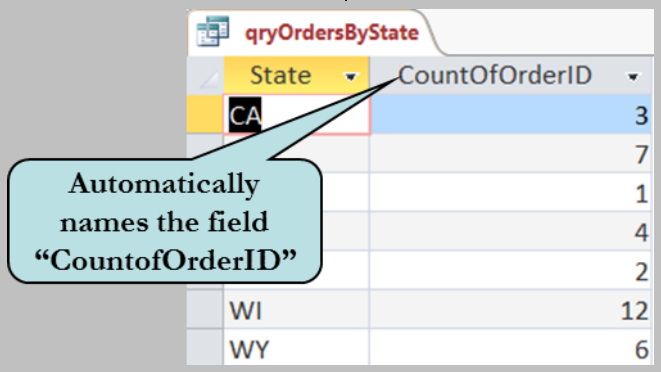
Aggregate Functions

Function	Description
Sum	Totals the values for each group.
Avg	Calculates the average value for each group.
Min	Returns the lowest value in each group.
Max	Returns the highest value in each group.
Count	Returns the number of items in each group, not including blank (Null) records.
StDev	Returns the standard deviation for each group.
Var	Returns the variance for each group.
First	Returns the first value in each group
Last	Returns the last value in each group.
Expression	Create a calculated field that includes an aggregate function in its calculation.
Where	Specify criteria for a field you are using to define groupings.
Group By	Define the groups for which you want to perform the calculations. For example, to show total sales by Product, select **Group By** for the Product Name field.

Let's Try It!

What	Why
1. Click the **Create tab** on the Ribbon.	Switches to Create commands and tools.
2. Click the **Query Design button** on the Other tab of the Ribbon.	Displays the Show Table dialog box.
3. Select **tblCustomers** and then click **Add**.	Adds tblOrders to the query.
4. Select **tblOrders** and then click **Add**.	Adds tblOrders to the query.
5. Click the **Close** button.	Closes the Show Table dialog box.
6. Double-click the **State** field in tblCustomers.	Adds the State field to the query grid. This is the field by which we wish to group our records.
7. Double-click the **OrderID** field in tblOrders.	Adds the OrderID field to the query grid. This is the field we wish to total.
8. Click the **Totals button** on the Show/Hide group on the Ribbon.	Displays the Total row.
9. Click in the **Total** row for the **OrderID** field.	Displays the drop-down arrow for the OrderID field.
10. Click on the arrow and then select **Count** from the drop-down list as shown below.	Selects Count as the aggregate function for the OrderID field. This query will generate a total of orders (count of all of the orders) by each state.



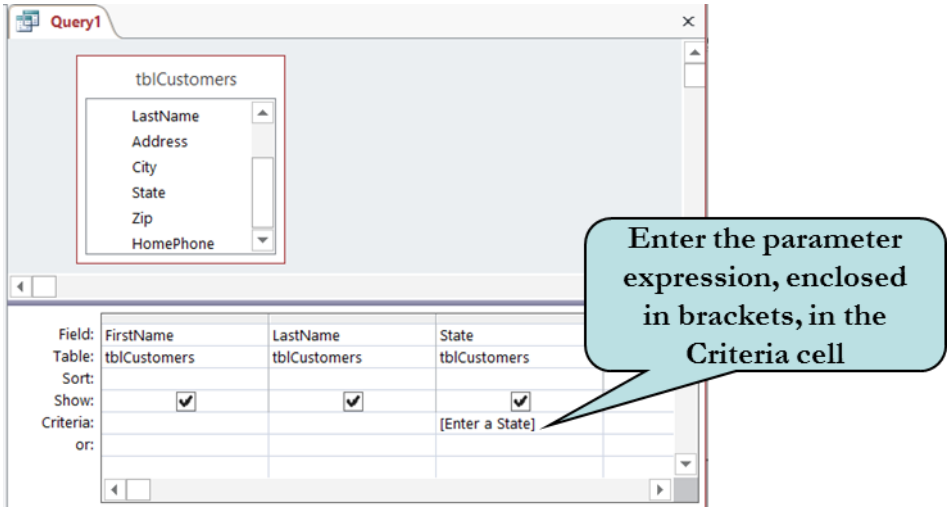
What	Why
11. Click the **Save** button and then type: **qryOrdersByState** in the Query Name box.	Provides a name for our query.
12. Click **OK**.	Saves the query and then closes the Query Name box.
13. Click the **Run** button.	Observe the results. The totals query displays the number of orders placed for each state. Note that the calculated field is automatically named: CountofOrderID as shown below.
	
14. Click the **View** button on the Ribbon.	Switches to Design View.
15. Click in the **Field** row of the **OrderID** field.	Sets the insertion point in the first row of the OrderID field.
16. Press the **Home** key on your keyboard.	Moves to the beginning of the line.
17. Type: **Total Orders:**	Changes the name of the calculated field to Total Orders.
18. Click the **Run** button.	Returns the results. Notice the name of the calculated field.

3.6 Creating a Parameter Query

In this lesson, you will learn how to create a parameter query.

If you find yourself changing the criteria for the same query over and over, you may wish to convert your query into a **Parameter Query**. Instead of manually entering the criteria, a Parameter Query prompts the user for the criteria before the query is run. For example, you could create a Parameter Query to view orders for different states, rather than having to build a separate query for each state. When the query is run, the user receives a custom message, such as "Please Enter a State." The data the user enters is then applied as the query's criteria.

To create a Parameter Query, click in the Criteria cell of the desired query column and then **type the message, enclosed in brackets**, that you want the user to receive when the query is run. Access will then display to the user a parameter prompt that contains the text of the parameter expression that you entered in the Criteria row.



To Create a Parameter Query

1. Create a new query in Design view.
2. Click in the Criteria row of the field to which you wish to add a parameter expression.
3. Type the message, enclosed in brackets, that you want to appear to the user.

Prompting for Dates

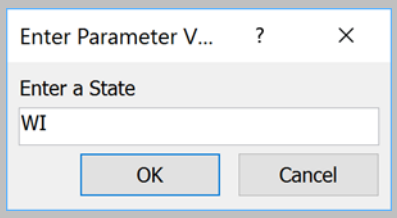
A common use of parameters is to prompt the user for a specific date range. For example, you might wish to see all orders for the past week. When you want to prompt the user for a specific date range, use the **Between And** operators, combined with parameter expressions as shown below:

Between [Enter the Beginning Date] And [Enter the Ending Date]

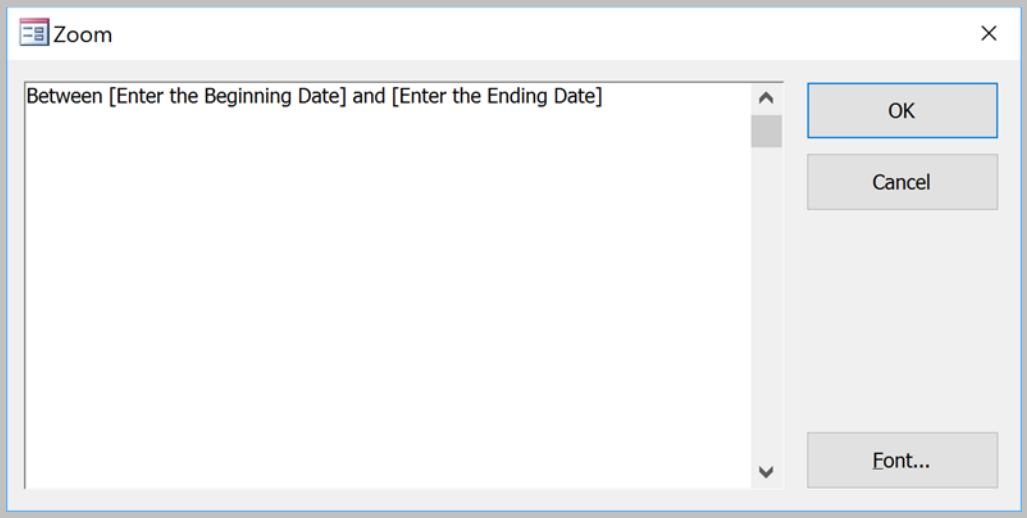
In the above structure, the user will receive two prompts – "Enter the Beginning Date" for the first date in the time period and "Enter the Ending Date" for the last date in the time period.

> **Tip:** To control the order of the parameters for multi-parameter queries or to control the data type, use the **Query Parameters** dialog box. Click the Parameters button on the Ribbon and enter your parameters on each row.

Let's Try It!

What	Why
1. Click the **View** button on the Ribbon.	Switches to Design View.
2. Click in the **Criteria Row** for the **State** field.	Sets the insertion point in the Criteria row for the field for which we want to enter a parameter expression.
3. Type: **[Enter a State]**	Enters the parameter expression.
4. Click the **Run** icon.	The Enter Parameter Value box appears.
5. Type: **WI** in the box as shown.	Enters the criteria for the query. 

What	Why
6. Click **OK**.	Runs the query, and applies the criteria of WI that you entered into the parameter value box.
7. Click the Close button on the Query window. **Save** your changes.	Saves and closes the query. We will now create a new query that prompts the user for a specific date range.
8. Click the **Create tab** on the Ribbon and then click the **Query Design button.**	Displays the Show Table dialog box.
9. Select **tblProducts** and then click **Add**.	Adds tblProducts to the query.
10. Click the **Close** button.	Closes the Show Table dialog box.
11. Double-click **Title**.	Adds the Title field to the query.
12. Scroll down and then double-click **Acquired**.	Adds the Acquired field to the query.
13. Click in the **Criteria Row** for the **Acquired** field.	Sets the insertion point in the Criteria row of the field for which we want to enter a parameter expression.
14. Press the **Shift + F2** key combination.	Opens the Zoom window.
15. Type: **Between [Enter the Beginning Date] And [Enter the Ending Date]** in the Zoom Window as shown below.	Enters the parameter expression for a specific time period.

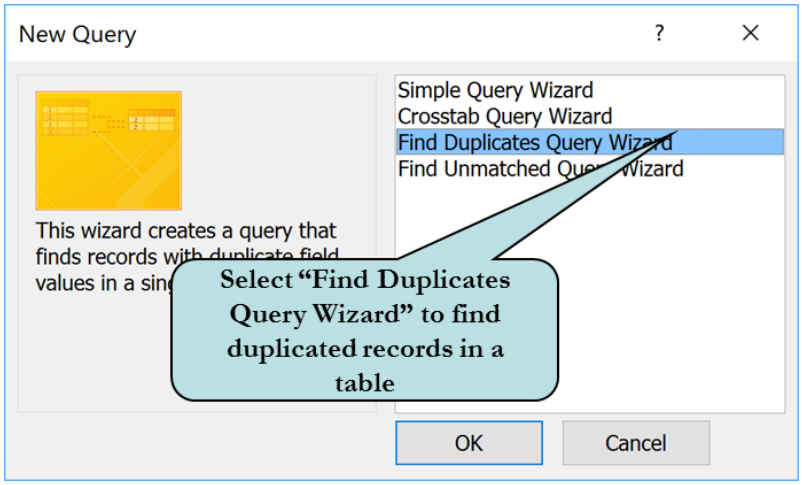
What	Why
	
16. Click **OK**.	Closes the Zoom window.
17. Click the **Save** button and then type: **qryParamAcquired** in the Query Name box.	Provides a name for our query.
18. Click **OK**.	Saves the query and then closes the Query Name box.
19. Click the **Run** icon.	Displays the parameter box for the first time period date. In this case, we want to see all movies acquired during 2002.
20. Type: **1/1/02** and then click **OK**.	Enter the first parameter and then displays the parameter box for the last time period date.
21. Type: **12/31/02** and then click **OK**.	Enter the second parameter and then displays the query results.
22. Click the Close button on the Query window.	Closes the query.

3.7 Creating a Find Duplicates Query

In this lesson, you will learn how to create a query to find duplicate records.

Access provides a nice tool to help you quickly find duplicate records in a table. For instance, the same customer could have been entered into the Customers table more than once or perhaps an order was inadvertently entered in twice by different data entry persons. To quickly find duplicate records, use the **Find Duplicates Query Wizard**.

To launch the Find Duplicates Query Wizard, click the Query Wizard button on the Create Ribbon and then choose the Find Duplicates Query Wizard. The wizard will then step you though the process of finding duplicate records in your table.

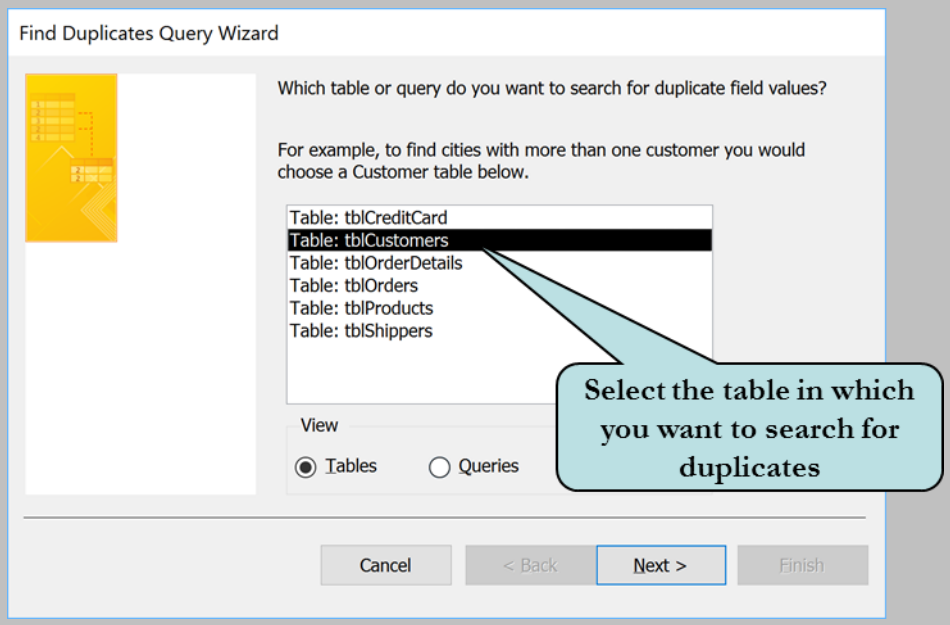


To Create a Find Duplicates Query

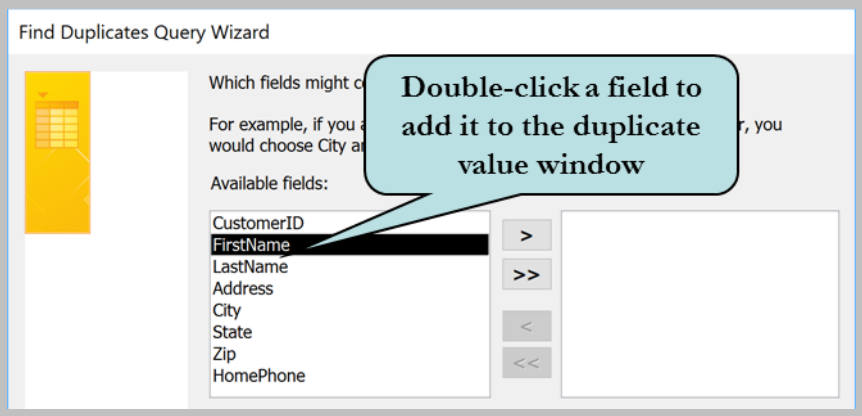
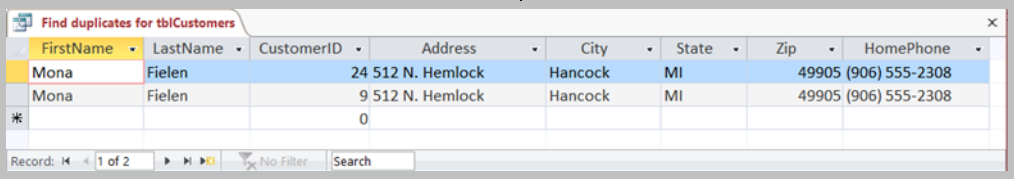
1. Click the **Create** tab on the Ribbon.
2. Click the **Query Wizard** on the Queries group of the Ribbon.
3. Click **Find Duplicates Query Wizard**.
4. Click **OK**.
5. Select the table that you want to search for duplicate values.
6. Click **Next**.
7. Double-click the fields that you want to search for duplicate values.
8. Click **Next**.
9. Double-click any other fields you want to see in the results (or click the >> button to add all additional fields at once)
10. Click **Next**.
11. Type in a name for your new query.
12. Click **Finish**.

Let's Try It!

What	Why
1. Click the **Create** tab on the Ribbon.	Displays Create commands and tools.
2. Click the **Query Wizard button** on the Queries group on the Ribbon.	Launches the Query Wizard.
3. Select **Find Duplicates Query Wizard** and then click **OK**.	Launches the Find Duplicates Query Wizard.
4. Select **tblCustomers** as shown below.	Select the table in which we want to search for duplicates.



5. Click **Next**.	Moves to the next step of the Wizard.
6. In the available fields window, **double-click** the following fields as shown below: **FirstName** **LastName**	Select the fields that we want to search for duplicates. As several customers could have the same last name, we will search for duplicates in the FirstName and LastName fields.

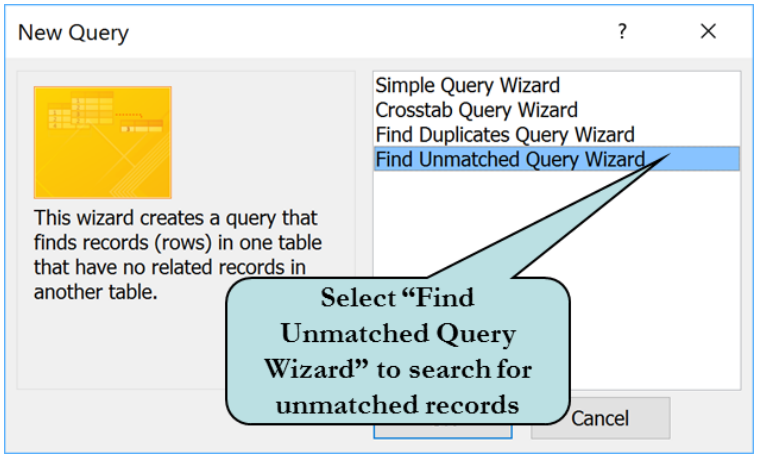
What	Why
	
7. Click **Next**.	Moves to the next step of the Wizard.
8. Click the **>>** button.	Adds the rest of the fields to the query. This is optional – you could just include only the fields for which you want to find duplicates.
9. Click **Finish**.	Completes the Wizard and runs the query. As we can see, we have one duplicate record for Mona Fielen.
	
10. Click the record selector for the first record, CustomerID of 24.	Selects the duplicate record we want to delete.
11. Press the **Delete** key.	Displays a warning message confirming that you are about to delete 1 records.
12. Click **Yes.**	Deletes the selected record.
13. Click the **Close button** for the query. Save any changes.	Closes the Find Duplicates query.

3.8 Creating a Find Unmatched Records Query

In this lesson, you will learn how to create a query to find unmatched records in two tables.

Another helpful Query Wizard is the **Find Unmatched Query Wizard**. This wizard builds a query that helps you find records in one table that do not have matching records in another table. A use for this query might be to find customers who have never placed an order. If this were the case, a record for a customer would exist in the Customers table but not in the Orders table.

Another use for the Find Unmatched Query Wizard may be to fix Referential Integrity Errors. Someone could have typed in an incorrect customer number in the Orders table, thus creating an orphaned record; that is to say, a record in the child table that does not have a related record in the parent table. Of course, many of these types of problems can be avoided by setting Referential Integrity when creating your relationships.



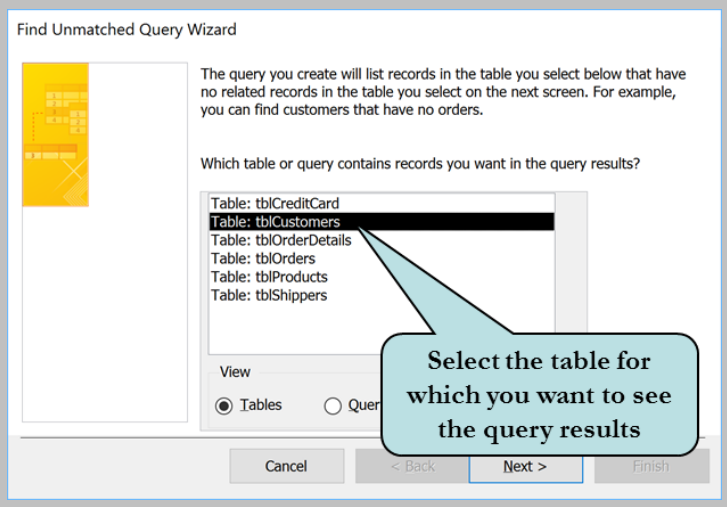
To Create a Find Unmatched Query

1. Click the **Create** tab on the Ribbon.
2. Click the **Query Wizard** on the Queries group of the Ribbon.
3. Select **Find Unmatched Query Wizard** and then click **OK**.
4. Select the table for which you want to display the query results. For example, in a Customers → Orders scenario, this would be the Customers Table.
5. Click **Next**.
6. Select the table that contains the related records. For example, in a Customers → Orders scenario, this would be the Orders Table.
7. Click **Next**.

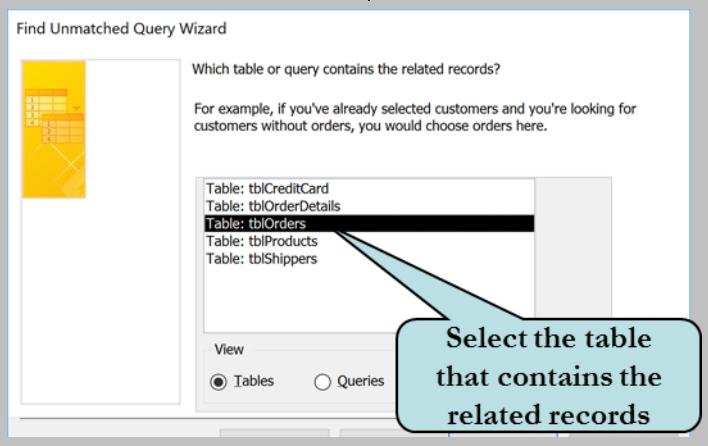
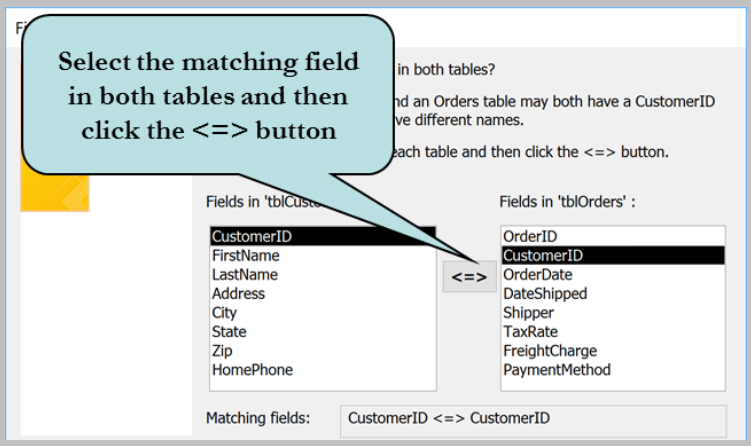
8. Select the matching field in both tables. For example, in a Customers → Orders scenario, this would most likely be the Customer ID field.
9. Click **Next**.
10. Double-click any fields that you want to appear in the query's results.
11. Click **Finish**.

Let's Try It!

What	Why
1. Click the **Create** tab on the Ribbon.	Displays Create commands and tools.
2. Click the **Query Wizard button** on the Queries group on the Ribbon.	Launches the Query Wizard.
3. Select **Find Unmatched Query Wizard** and then click **OK**.	Launches the Find Unmatched Query Wizard.
4. Select **tblCustomers** as shown below.	Selects the table for which we want to see the query results. This would often be the parent table in a relationship.



5. Click **Next**.	Moves to the next step of the Wizard.

What	Why
6. Select **tblOrders** as shown below.	Selects the table that contains the related records. This would often be the child table in a relationship.
	
7. Click **Next**.	Moves to the next step of the Wizard.
8. Select the **CustomerID field** in both the tblCustomers window and the tblOrders window and then click the **<=> button** as shown below.	Selects the matching field in the two tables.
	
9. Click **Next**.	Moves to the next step of the Wizard.

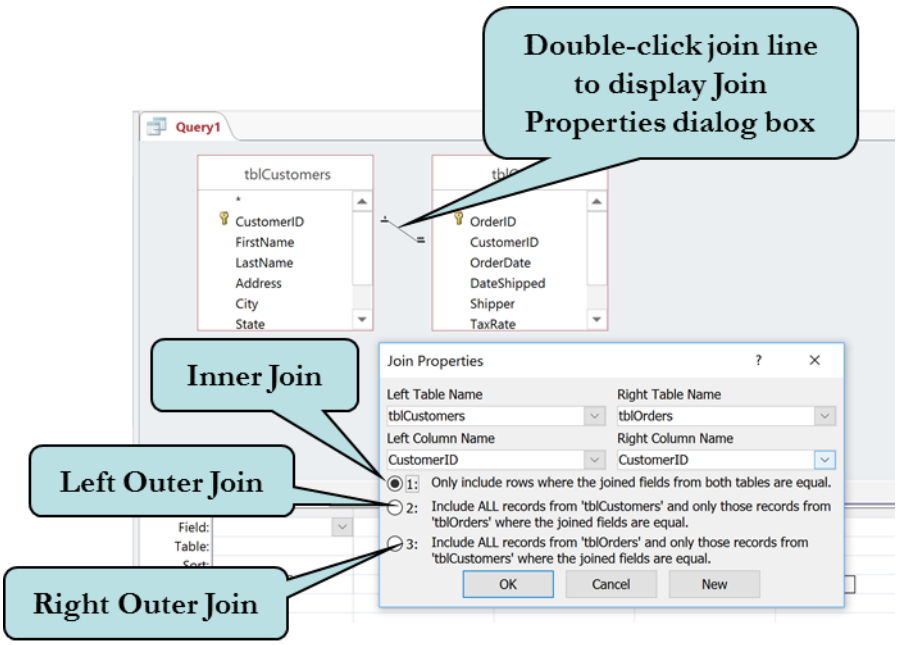
What	Why
10. Click the **>>** button.	Adds the rest of the fields to the query.
11. Click **Finish**.	Completes the query and displays the results. In this case, we have two customers that have not placed an order, Sara Beckman and Jaime Rickman.
12. Click the **Close button** on the query window. Save any changes.	Closes the Find Unmatched query.

3.9 Modifying Query Joins

In this lesson, you will learn how to change the type of join in a query.

We create relationships between our tables by dragging from one table to another. This in turn creates a **join line**, which informs us that a relationship exists between two tables. The default join type is an **inner join**, which displays data only if there are matching values in both the join fields.

For example, in the last section, we discovered that there were some customers in the tblCustomers who did not place an order. Thus, there was no matching record for them in tblOrders. If we created a query than included tblCustomer and tblOrders, joining the two tables on CustomerID, the customers who had never ordered would not be displayed in the query results.



If you want the query to display all records from one table regardless of whether it has matching records in the other table, you can change the join type to an **outer join.** There are two types of outer joins: the **left outer join** and the **right outer join**. A left outer join displays all records from the table on the left side of the join and only matching records from the table on the right side of the join. Likewise, a right outer join displays all records from the table on the right side of the join and only matching records from the table on the left side of the join.

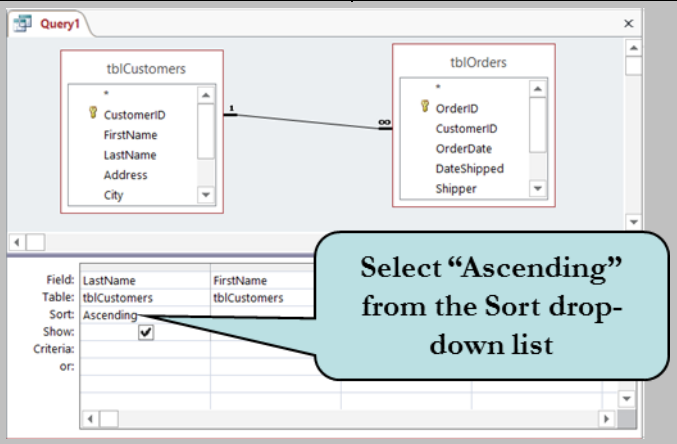
To change the join type of a relationship in a query, double-click the join line and then select number 1 for an inner join, number 2 for a left outer join or number 3 for a right outer join.

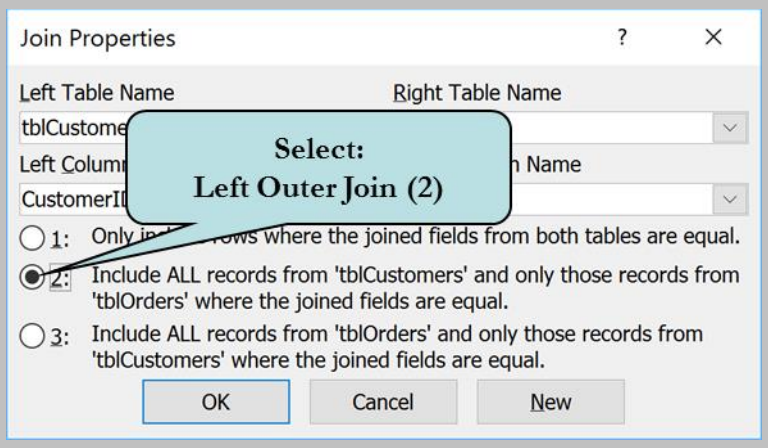
To Modify a Join Type in a Query

1. Select the query whose **join type** you want to change.
2. Click the **Design View** button.
3. Double-click the **join line** that you wish to modify.
4. In the Join Properties box:
   a. Select **1** to set the join type as an **inner join**.
   b. Select **2** to set the join type as a **left outer join**.
   c. Select **3** to set the join type as a **right outer join**.
5. Click **OK**.

Let's Try It!

What	Why
1. Click the **Create** tab on the Ribbon.	Displays Create commands and tools.
2. Click the **Query Design button** on the Queries group on the Ribbon.	Displays the Show Table dialog box.
3. Select **tblCustomers** and then click the **Add** button.	Adds tblCustomer to the query.
4. Select **tblOrders** and then click the **Add** button.	Adds tblOrders to the query.
5. Click the **Close** button.	Closes the Show Table box.
6. Double-click the **LastName** field in the Field List for tblCustomers.	Adds the LastName field to the Query Grid.
7. Double-click the **FirstName** field in the tblCustomers field list.	Adds the FirstName field to the Query Grid.

What	Why
8. Double-click the **OrderID** field in the tblOrders field list.	Adds the OrderID field to the Query Grid.
9. Click in the **Sort** field for the LastName field and then chose **Ascending** by clicking on the arrow as shown below.	Sets the query to sort ascending by the LastName field.
	
10. Click the **Run** button.	Executes the query. Notice that the two customers who did not place an order, Sara Beckman and Jaime Rickman are not listed in the results. There are 35 records in the table.
11. Click the **View** button on the Ribbon.	Switches to Design View.
12. **Double-click** the join line between tblCustomers and tblOrders.	Displays the Join Properties box.
13. Click the radio button to the left of the **2** as shown below.	Sets the join type as a left outer join. This will display all records from tblCustomers and any matching records from tblOrders. All customers, regardless of whether or not they placed an order, will be displayed.

What	Why
	
14. Click **OK**.	Closes the Join Properties box.
15. Click the **Save** button.	Opens the Save As dialog box, as we have not yet saved our query.
16. Type: **qryCustomersWithoutOrders** in the Query Name box.	Provides a file name for our new query.
17. Click **OK**.	Saves the query and closes the Query Name dialog box.
18. Click the **Run Query** button.	Executes the query. Notice that Sara Beckman and Jaime Rickman are now included in the results. The OrderID field for these two customers is blank however, as they had not placed any orders.
19. Click the **Close button** on the query window.	Closes the query.
20. Click the **File tab** on the Ribbon and click **Close** from the File Options menu.	Closes the database.

Lesson Summary – Working with Queries

- In this lesson, you worked with multi-table queries - a query that retrieves information from more than one related table. When adding multiple tables to your query, Access automatically creates the joins between them, assuming that you have set up your relationships beforehand.
- Then, you learned how to perform calculations in queries by entering the calculation, with the field names in brackets, in the Field Row in the query grid. An example of a calculation is: Total: [Quantity] * [Price].
- Next, you learned how to change the formatting of query fields from the Query Property Sheet pane. Select the field you want to format and click the Property Sheet button on the Ribbon.
- Next, you worked with the Expression Builder which helps you build your expressions by allowing you to pick the fields from various tables and/or queries, operators and even built-in functions for your expressions. To launch the Expression Builder, click in the field for which you wish to create an expression, and then click the Builder Button on the Ribbon.
- Next, you learned how to summarize information for a group of records by creating a Totals Query. For example, you might need to know the total amount of sales by each state or perhaps which customers spent more than $200. To create a Totals Query, add a Total row to your query by clicking the Totals Button (or by right-clicking and selecting Totals from the contextual menu) and choosing the aggregate function you want from the Totals drop-down list.
- Next, you learned how to create a Parameter Query which prompts the user for the criteria before the query is run and then applies the data that the user entered as the query's criteria. To create a Parameter Query, click in the Criteria cell of the desired query column and then type the message, enclosed in brackets, that you want the user to receive when the query is run.
- Next, you learned how to quickly find duplicate records in a table using the Find Duplicates Query Wizard. Click the Query Wizard button on the Create Ribbon and then choose the Find Duplicates Query Wizard. The wizard will then step you though the process of finding duplicate records in your table.
- Next, you learned how to find records in one table that do not have matching records in another table using the Find Unmatched Query Wizard. Click the Query Wizard button on the Create Ribbon and then choose Find Unmatched Query Wizard. The wizard will then step you though the process of finding duplicate records in your table.

- Lastly, you learned how to change the join type of a relationship in a query by double-clicking the join line and then selecting number 1 for an inner join (only matching records in both tables are returned), number 2 for a left outer join (displays all records from the table on the left side of the join and only matching records from the table on the right side of the join) or number 3 for a right outer join (displays all records from the table on the right side of the join and only matching records from the table on the left side of the join).

Lesson 3 Quiz

1. You don't need to worry about setting up relationships beforehand – Access will automatically do this for you when you create a multi-table query.
   A. True
   B. False

2. You have two fields in your query – a Quantity field and an ItemCost field. You want to create a calculated expression that will multiply these two fields together to calculate the total cost for an item. Write the expression that will accomplish this, naming the new field "ItemTotal"

3. To change the format of a field in a query, you select the field you want to modify and then:
   A. Click the Format button on the Design Ribbon, click the Format drop-down list and choose the desired format.
   B. Click the Properties button on the Design Ribbon, click the Format drop-down list and choose the desired format.
   C. Click the Property Sheet button on the Design Ribbon, click the Format drop-down list and choose the desired format.
   D. Click the Properties button on the Create Ribbon, click the Format drop-down list and choose the desired format.

4. What is the keyboard command to launch the Zoom Window?
   A. Alt + F2
   B. Shift + F2
   C. Ctrl + F2
   D. Ctrl + Z

5. What tool helps you to build the calculation that you need by allowing you to choose the fields from the tables and queries in your database?
   A. Calculation Builder
   B. Functions Builder
   C. Zoom Builder
   D. Expression Builder

6. To summarize information for a group of records, you would use a _____ (fill in the blank) Query.

7. Which of the following is not an example of an aggregate function?
   A. Count
   B. Sum
   C. Multiply
   D. Min

8. How can you display the Totals Row in a query?

9. Write the criteria for a parameter query that will prompt the user to enter a specific date range.

10. If you wanted to see if there were two or more identical records in a table, you would use:
    A. The Find Duplicates Query Wizard
    B. The Find Identical Records Query Wizard
    C. The Find Matched Records Query Wizard
    D. The Return Duplicate Records Query Wizard

11. You want to find out if there are any orphaned records in your Orders table. To do this you would create a _____ (fill in the blank) query.

12. To display all of the records in your customers table (even if they haven't placed an order) and all of the records in your orders table (assuming there are no orphaned records). What type of table join would you need to establish?
    A. Inner Join
    B. Left Inner Join
    C. Left Outer Join
    D. Right Outer Join

LAB 3 – ON YOUR OWN

1. Open the **Lab3** database in the Lessons folder.
2. Create a new multi-table query in design view. Add the following tables to the query:

   tblClasses
   tblStudentClasses
   tblStudents

   Add the following fields to the query:

   FirstName (tblStudents)
   LastName (tblStudents)
   ClassName (tblClasses)
   Semester (tblStudentClasses)
   Year (tblStudentClasses)
   ClassCost (tblClasses)

   Save the query with the name: **qryRegistration**
3. Create a new calculated field that adds a 20 dollar administration fee to the Class Cost. Name the field: **Total with Fee**. (Hint: Do not surround the number 20 in brackets).
4. Change the format of the **Total with Fee** field to Currency. Run the query and observe the results.
5. Switch to Design view. Add a parameter in the **Year** field that prompts the user to enter a year. Run the query and enter 2003 as the year when prompted. Save and close the query.
6. Create a new query in Design view and add the same tables as in Step 2. Add the **FirstName**, **LastName, Year** and **ClassCost** fields. Create a Totals Query that totals the class cost for each student for 2003. (Hint: Use the Sum function on the ClassCost field). Change the format of the ClassCost field to Currency with two decimal places. Save the query as: **qryStudentCost** and then run the query. Close the query.
7. Create a new query using the tblStudents and tblStudentClasses tables. Add the **FirstName, LastName,** and **ClassID** field. Change the join type to a **left outer join** (Hint: Join Type 2). Save the query as: **qryStudentsNotRegistered**. Run the query. How many students have not signed up for classes?
8. Close the query and the database.

Lesson 4

Lesson 4 - Working with Forms

Lesson Topics:

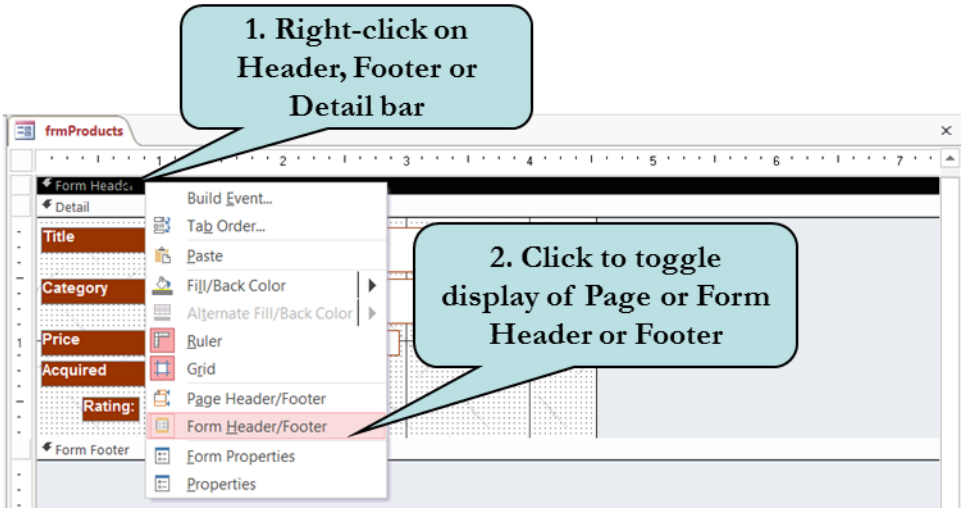
4.1 Adding Headers and Footers

In this lesson, you will learn how to add a header and footer to a form.

Forms are tools that interface between a user and the data, so that entering and editing data is easier. Most forms contain a **detail section** that displays the records from your table and most form controls appear in the detail section. There are also four other optional form sections:

- **Page Header** – information in this section appears on the top of each page of the form.
- **Page Footer** – information in this section appears on the bottom of each page of the form.
- **Form Header-** information in this section appears on the first page of the form.
- **Form Footer** – information in this section appears on the last page of the form.

When creating a new form, a Form Header and Form Footer are added by default. As the purpose of forms is typically for data entry and not printing, the Page Header and Footer are not automatically displayed. However, if you wish to add a Page Header and Footer, right-click on the Form Header bar, Form Footer bar or the Detail bar and choose Page Header/Footer from the contextual menu to toggle it on or off. Likewise, you can toggle the Form Header and Footer by selecting the Form Header/Footer from the contextual menu.



Page Headers and Footers are useful for information such as page numbers, column titles, or any other information that you want to appear on each printed page. Form headers and footers are useful for information such as the form title, a company logo, or any other information that you want to appear on the first or last printed page of the form.

Before adding controls to a form section, you may need to **resize the section** first. To resize a header or footer section, move your mouse pointer over the bottom edge of the section until the pointer transforms into a **black cross with a vertical arrow**, and then drag downwards until the section is the desired size.

Black Cross with Vertical Arrow Pointer

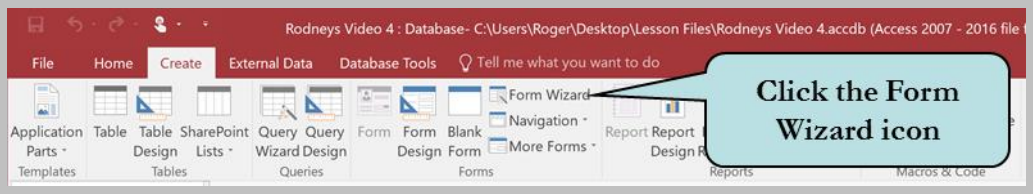
To Add a Header and Footer to a Form

1. Open the form in Design View
2. To add or remove a form header/footer, right-click on the Form Header bar, Form Footer bar or the Detail bar and choose Form Header/Footer from the contextual menu to toggle the display.
3. To add or remove a page header/footer, right-click on the Form Header bar, Form Footer bar or the Detail bar and choose Page Header/Footer from the contextual menu to toggle the display.
4. To resize a header or footer, move your mouse pointer over the bottom edge of the section until the pointer transforms into a **black cross with a vertical arrow,** and then drag downwards until the section is the desired size.

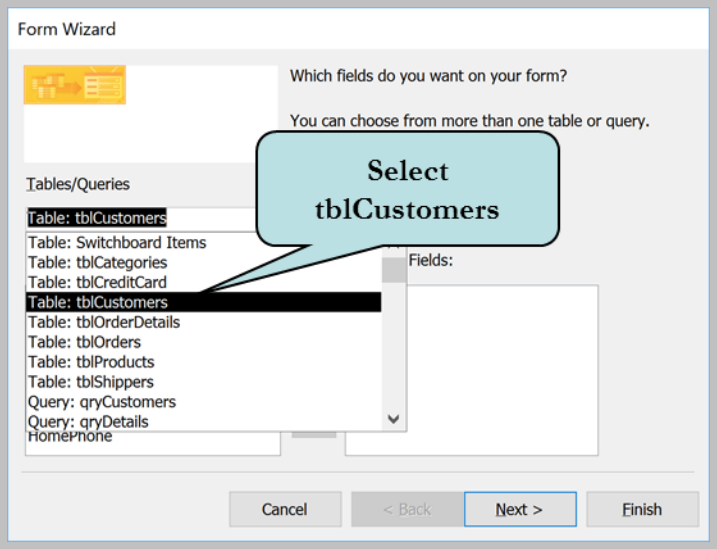
Let's Try It!

What	Why
1. Click the **File** tab on the Ribbon.	Displays Backstage view.
2. Click **Open** from Backstage view.	Displays the Open pane.
3. Click the **Browse** icon in the center pane.	Displays the Open dialog box.
4. Click **Desktop** on the left side of your screen.	Displays the Desktop folder.
5. Double-click the **Lesson Files** folder.	Opens the Lesson Files folder and displays the files in that folder.
6. Select the **Rodneys Video 4** file and then click **Open**.	Opens the Rodneys Video 4 database.

What	Why
7. Click the **Create tab** on the Ribbon.	Switches to Create commands and tools.
8. Click the **Form Wizard** button on the Forms group as shown below.	Launches the Form Wizard.

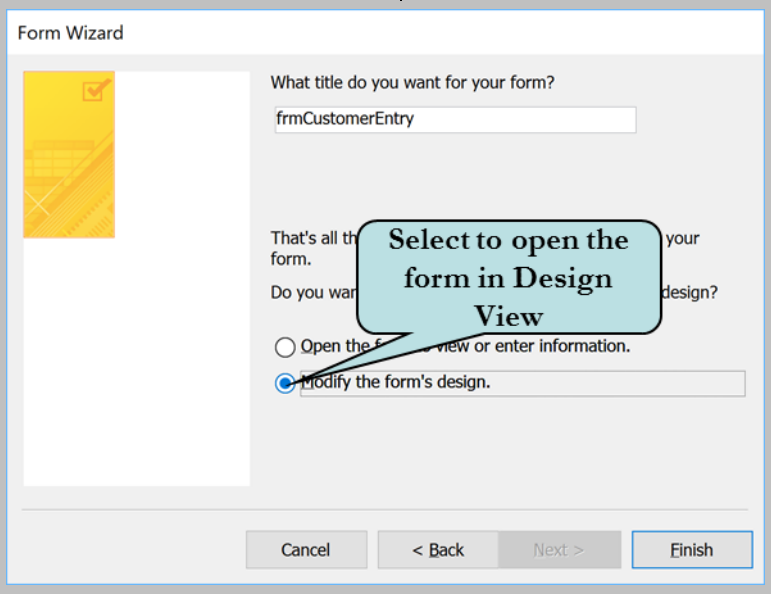


9. Click the **Tables/Queries** drop-down list, scroll up and select **tblCustomers** as shown below.	Selects the table upon which we want to base our form.

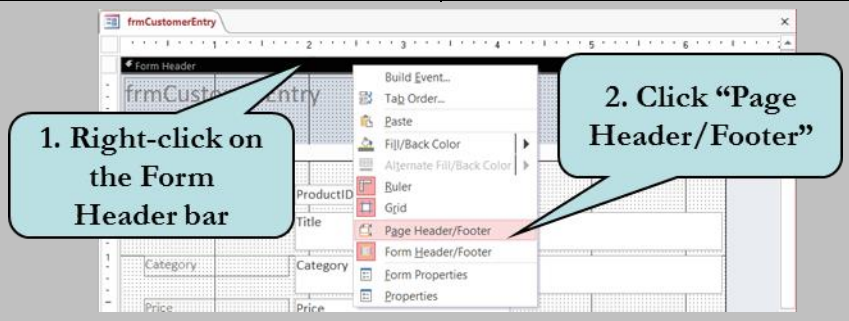


10. Click the **>>** button and then click **Next**.	Adds all fields to the form and then moves to the next step of the wizard.
11. Choose **Columnar** and then click **Next**.	Chooses the form layout and then moves to the next step of the wizard.
12. Type: **frmCustomerEntry** in the Form Title Box.	Enters a title and file name for our form.

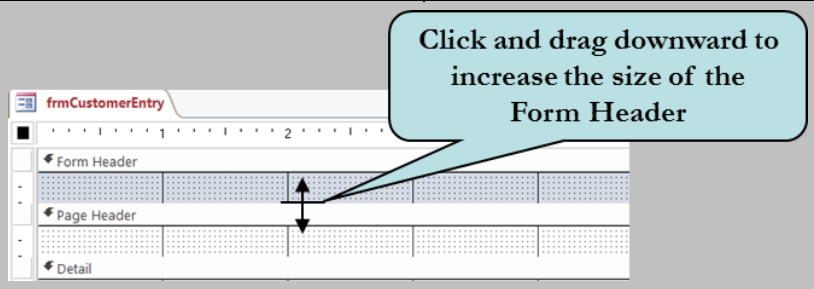
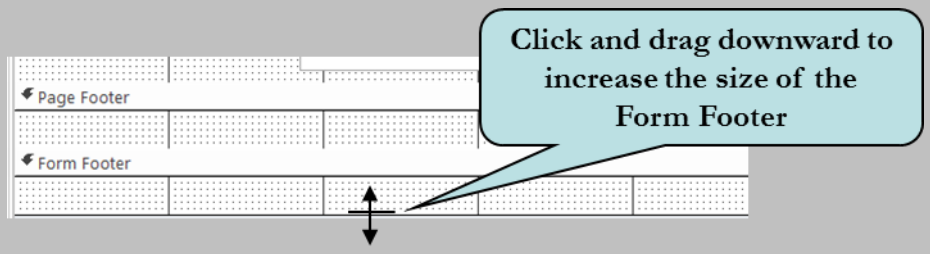
What	Why
13. Click the **Modify the Form's Design** radio button as shown below and then click **Finish.**	Opens the form in Design View.



14. Right-click on the **Form Header bar** and then choose **Page Header/Footer** from the menu.	Displays the Page Header & Footer



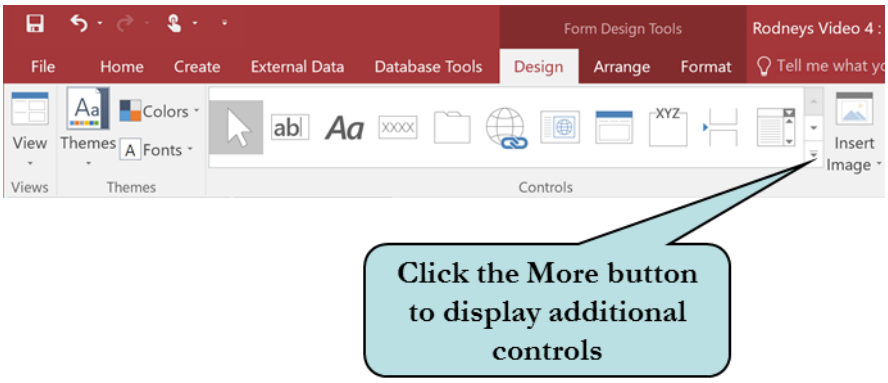
15. Right-click on the **Form Header** bar and then choose **Form Header/Footer** from the menu. Click **Yes** when asked if you wish to delete the section.	Removes the Form Header and Footer.

What	Why
16. Right-click on the **Page Header** bar and then choose **Form Header/Footer** from the menu.	Adds the Form Header back into the Form. Note that when you remove the Form Header, any controls or formatting are permanently deleted.
17. Move your mouse pointer over the bottom border of the **Form Header** section until the pointer transforms into a **black cross with a vertical arrow** as shown below. **Click** and then **drag** downwards as shown below until the Form Header is about 1 inch tall.	Increases the size of the Form Header to about 1 inch.
	
18. Move your mouse pointer over the bottom border of the **Form Footer** until the pointer transforms into a **black cross with a vertical arrow** as shown below. **Click** and then **drag** downwards until the Form Footer is about ½ inch tall.	Increases the size of the Form Footer to about ½ inch.
	
19. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.

4.2 Adding Controls to a Form

In this lesson, you will learn how to add controls to a form.

The objects on a form are called **Controls.** These include text boxes, labels, graphics, lines, radio buttons, combo boxes and list boxes, just to name a few. You can add a control to a form by clicking the control you wish to use on the **Controls group** of the Design Ribbon and then dragging it onto the form. To display a Smart Tab that informs you of the name of a control, position your mouse pointer over any control on the Ribbon.



Controls group on the Design Ribbon

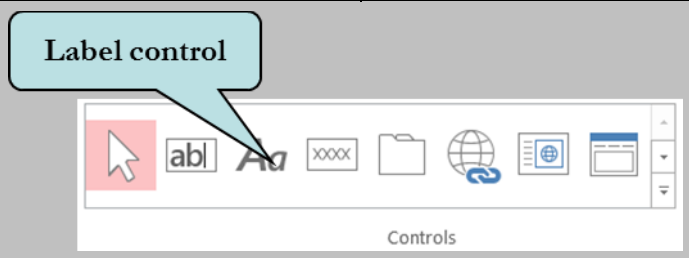
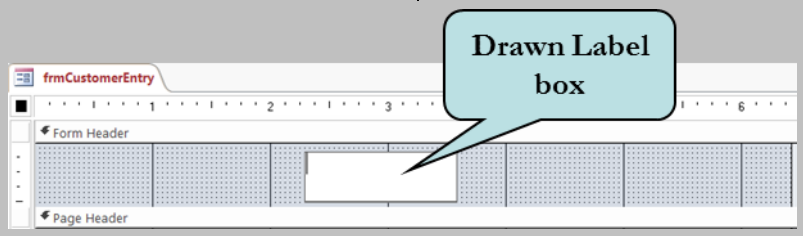
Once a control is placed on your form, it can easily be resized or moved to a different location.

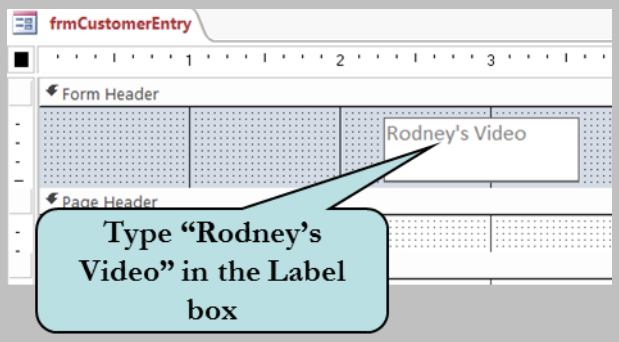
To Add a Control to a Form

1. Open the form in Design View.
2. If necessary, click the Design tab on the Ribbon.
3. Click the control on the Controls group that you want to add to your form. To display additional controls, click the **More button** on the Controls group.
4. Drag the control on the desired location of your form.

Tip:	You can also insert a pre-formatted Title box by clicking the **Title** button on the Header/Footer group on the Ribbon. The box will automatically be inserted in the Form Header.

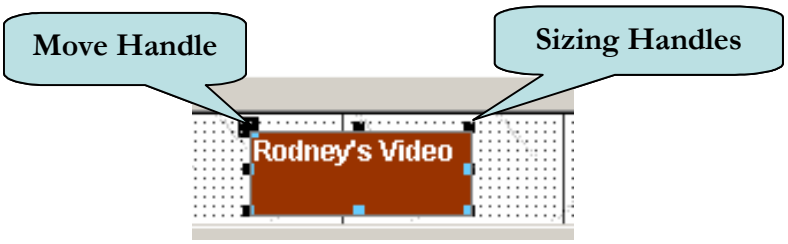
Let's Try It!

What	Why
1. Click the **Design tab** on the Ribbon.	Switches to form Design commands and tools.
2. Click the **Label** tool on the Controls group of the Ribbon as shown below.	Activates the label tool. We are going to add a label to the Form Header.
	
3. Click your left mouse button and then **draw a box** about ½ tall and 1 inch long in the middle of the Form Header as shown below.	Draws the Label box in the Form Header.
	
4. Type: **Rodney's Video** as shown below.	Enters text in our label box.

What	Why
	
5. Click anywhere outside of the label control.	Deselects the label control.
6. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.

4.3 Moving and Sizing Controls

In this lesson, you will learn how to move and size controls on a form.



Once you add a control to a form, chances are that you will either change its location on the form or modify its size. When you select a control, small boxes called **sizing handles** appear around it. To change the control's length or height, move your cursor over the desired sizing handle until the cursor transforms into a **double black arrow**, then click and drag until the control is the desired size.

You can move a control that is selected in one of two ways. One way is to use the **move handle**, which is located on the top left of the selected control. Position your mouse pointer over the move handle until the pointer transforms into a 4-way arrow, click and then drag the control to the desired location. You can also move your mouse pointer over any border of the selected control until your pointer transforms into a 4-way arrow. Then, click and then drag the control to the desired location.

4-Way arrow pointer

Tip:	You can also move and resize controls from **Form Layout View**.

To Resize a Control

1. Open the form in Design View.
2. Select the control that you want to resize.
3. Click the desired sizing handle and then drag until the control is the desired size.

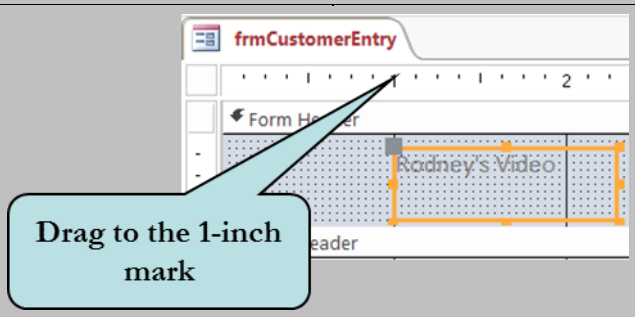
To Move a Control

1. Open the form in Design View.
2. Select the control you wish to move.
3. Move your mouse pointer over the border until the pointer changes to a 4-way arrow
   Or
   Move the pointer over the move handle until the pointer changes to a 4-way arrow.
4. Click and then drag the control to the desired location.

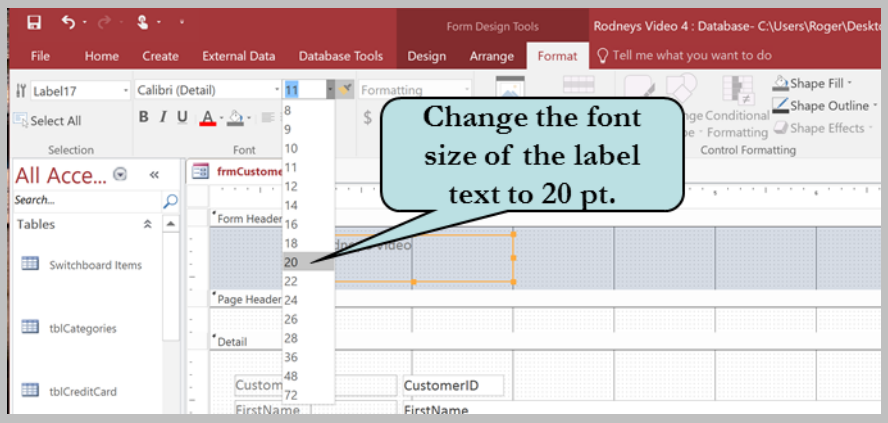
> **Tip:** When moving a text box and its label, use the moving handle to move either the text box or its label independently of each other. To move the text box and its label together, click on the border of either object and then drag to the desired location.

Let's Try It!

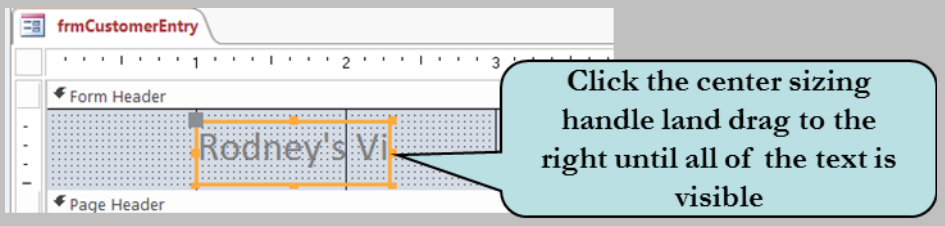
What	Why
1. Click the border of the **Rodneys Video** label in the Form Header.	Selects the object we wish to move.
2. Position your cursor over the move handle on the top left corner of the label until the cursor transforms into a 4-way arrow.	Enters move mode.
3. Click and drag the label to the left until its left edge is at the 1 inch mark as shown. Release the mouse button.	Moves the label so that the left edge is at the 1 inch mark.



What	Why
4. Click the **Format tab** on the Ribbon.	Displays Format commands and tools.
5. With the control still selected, click the arrow in the **Font Size** box on the Font group and then select **20** from the drop-down list as shown below.	Changes the font size to 20. Notice that some of the text in our label is now cut off.



6. Move your mouse cursor over the center sizing handle on the right edge of the label as shown below and then drag to the right until all of the text is visible (about the 3-inch mark)	Changes the size of the label to accommodate the new font size.



7. Click the **Save** button.	Saves the design changes.
8. Press the **Ctrl + W** keystroke combination.	Closes the frmCustomerEntry form.

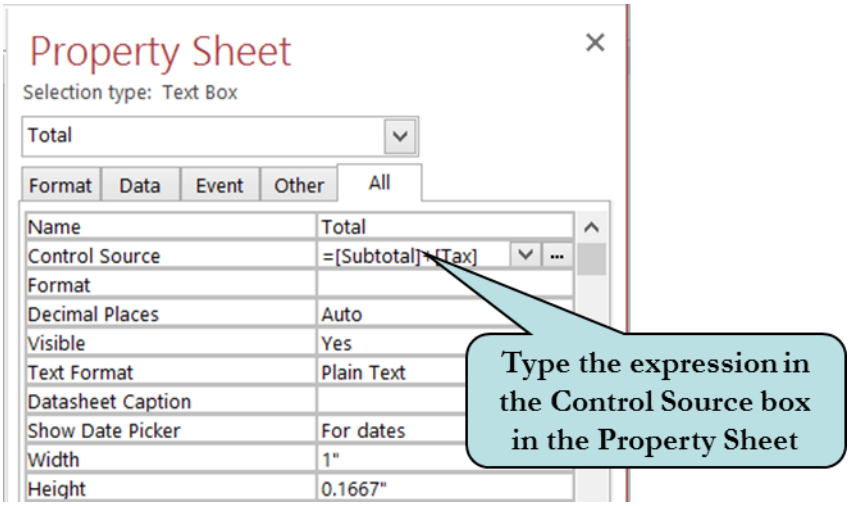
4.4 Creating a Calculated Control

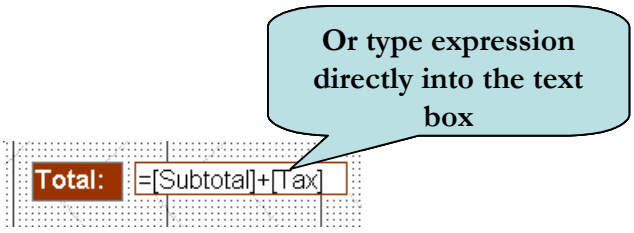
In this lesson, you will learn how to create a control that performs a calculation.

When creating a table in a database, you do not usually include any fields that can be calculated, such as "Total" fields (although beginning with Access 2010 you can add calculated fields in tables). We have already seen how to create a calculated field in a query. You can also perform calculations in forms by adding a **Calculated control** to your form. A Calculated control is an **unbound** control (that is to say, it is not bound to any field in a table) whose value is determined by an **expression.** Remember that expressions are a combination of identifiers, operators and values that produce a result. For example, to calculate an order total by adding the tax field to the subtotal field, you might enter an expression as follows:

=[Subtotal] + [Tax]

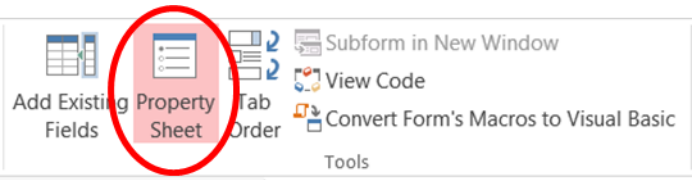
In forms, calculated controls are typically text boxes. All expressions in calculated controls are preceded by an equal (=) sign. This tells Access that the value is an expression. To create a calculated control, type the expression directly into an unbound text box or enter the expression in the **Control Source Property** of the **Property Box** as illustrated below.





To Create a Calculated Field on a Form

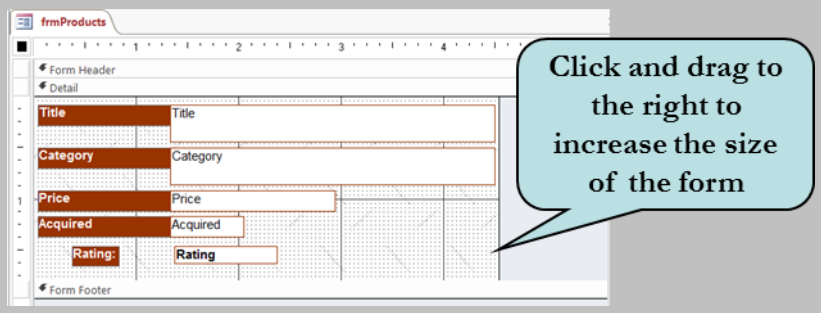
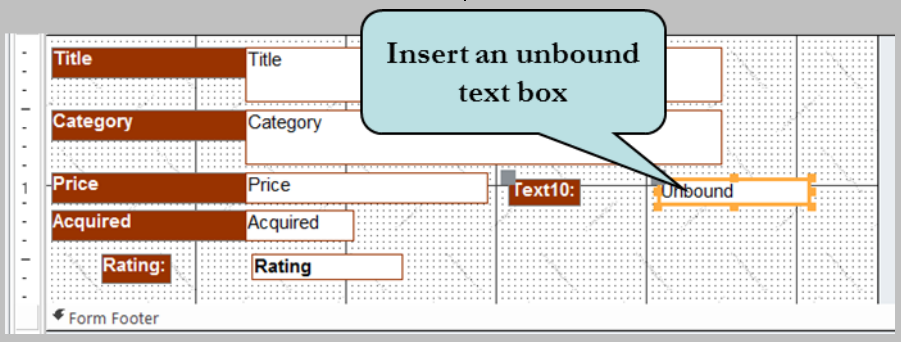
1. Display the form in Design View.
2. Click the Text Box tool on the Controls group of the Design Ribbon.
3. Click on your form at the location where you want to place the calculated field.
4. Place the insertion point in the text box and type the expression.
   Or
   Select the text box, click the **Property Sheet** button on the Tools group of the Design Ribbon and then type the expression in the **Control Source** property box.



Property Sheet Button

Let's Try It!

What	Why
1. Right-click **frmProducts** and then click **Design View** from the contextual menu. Maximize the form.	Switches to Design View and then maximizes the form.
2. Move your cursor over the right edge of the form until it transforms into a Double-arrow Mouse Pointer.	Enters drag mode.
3. Click and drag to the right as shown below until the right edge of the form is at the **5 ½** inch mark.	Increases the size of the form so we will have room to add a control to the right of the price field.

What	Why
	
4. Click the **Text Box Tool** on the Design Ribbon as shown below.	Activates the Text Box Tool.
	
5. Click to the right of the **Price** text box at the **4 inch mark** to insert an unbound text box as shown below.	Inserts an unbound text box to the right of the Price field at the 4 inch mark.
	
6. Click directly into the text box.	Sets the insertion point inside of the unbound text box.
7. Type: **=[Price] * .10**	Creates a new calculated control that calculates a 10% discount on the Price field.

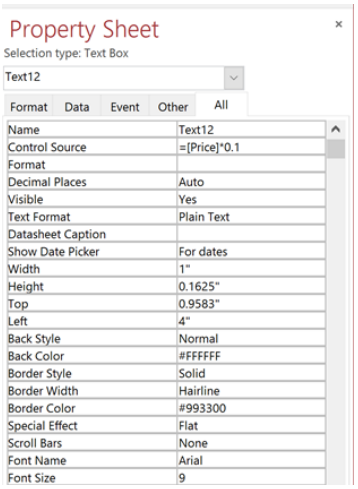
What	Why
8. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.
9. Click the **View** button on the Ribbon and observe the new field.	Switches to Form View. The new field calculates a 10% discount on the Price field for each record.

4.5 Changing Control Properties

In this lesson, you will learn how to modify the properties of a control.

The properties of a control allow you to change the look of the selected control. You can change the font size, font style, font color, number of decimal places, caption, and alignment just to name a few. You can even change the name of a control or provide a name to a new unbound control. Each type of control has many such properties or attributes that you can set.

You change the control properies via the **Property Sheet Pane**. To display the Property Sheet Pane, select the object and then click the **Property Sheet button** on the Tools group of the Design Ribbon. You can also **double-click** any object to display its Property Sheet or **right-click** on the object and then choose Properties from the pop-up menu.



Property Sheet for the Text Box Control

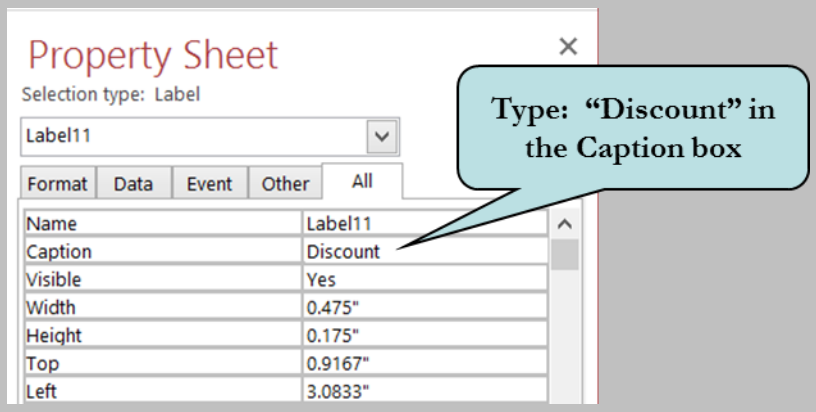
You can change the properties of **multiple controls** by selecting the first control, holding down the **Shift** key and then selecting any additional controls. Next, display the **Property Sheet Pane** and then change the desired properties. The changes you make will be applied to all of the controls you have selected.

To Change the Properties of a Control

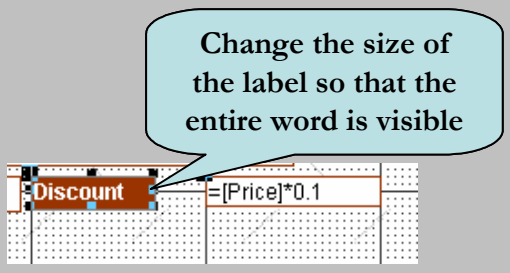
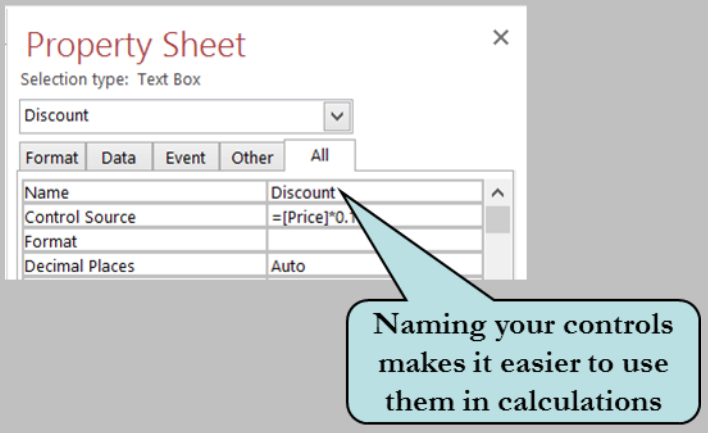
1. Select the control(s) whose properties you wish to change.
2. Click the **Property Sheet button** on the Design Ribbon
   Or
   Double-click the object to display its Property Sheet
   Or
   Right-click and then choose **Properties** from the pop-up menu.
3. Enter the desired changes in the Properties box.

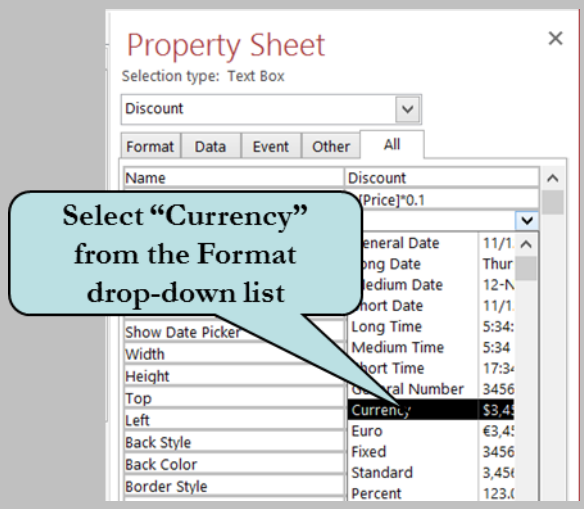
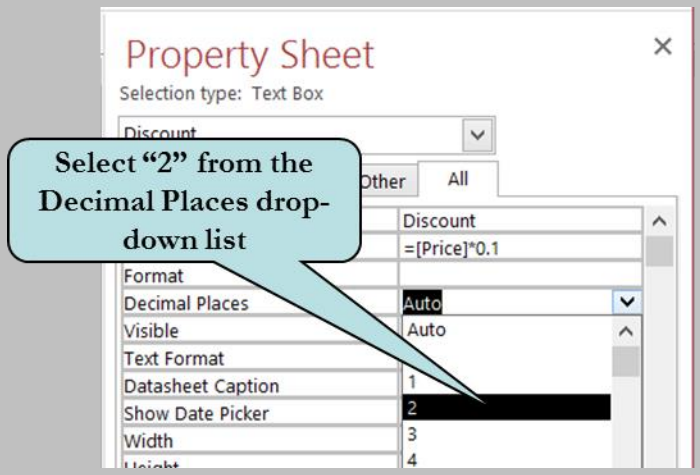
Let's Try It!

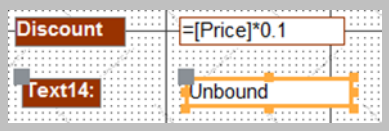
What	Why
1. Click the **arrow** on the **View** button and then click **Design View** from the menu.	Switches to Design View.
2. Click the **label** (not the text box) for the calculated control you created in the last section.	Selects the control whose properties we wish to change.
3. Click the **Property Sheet** button on the Design tab of the Ribbon.	Displays the Properties Box for the selected control.
4. In the **Caption box**, highlight the existing text and then type: **Discount** as shown below. Press Enter.	Changes the text of the selected label. Notice that part of the text of the label is cut off.



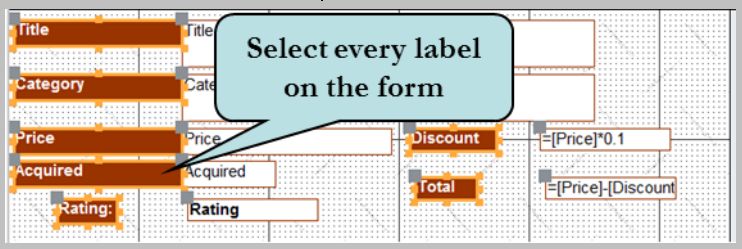
5. Click the **Close button** on the Property Sheet pane.	Closes the Property Sheet pane.

What	Why
6. With the **Discount Label** still selected, move your mouse pointer over the center sizing handle on the right edge of the label until your pointer transforms into a double arrow. Click and drag to the right until all of the text is visible as shown on the right.	Changes the size of the label to accommodate the text. 
7. Select the **Text Box** (not the label!) for the Discount field.	Selects the Text Box whose properties we wish to change.
8. Click the **Property Sheet Button** and then type: **Discount** in the **Name** Property box as shown (if you don't see the Name property, click the All tab on top of the Property Sheet). Press Enter.	Provides a name for our new field.
	
9. Click in the **Format** box.	Activates the Format property box and displays the drop-down arrow.
10. Click the drop-down arrow and select **Currency** from the drop-down list as shown below.	Changes the format of the field to currency.

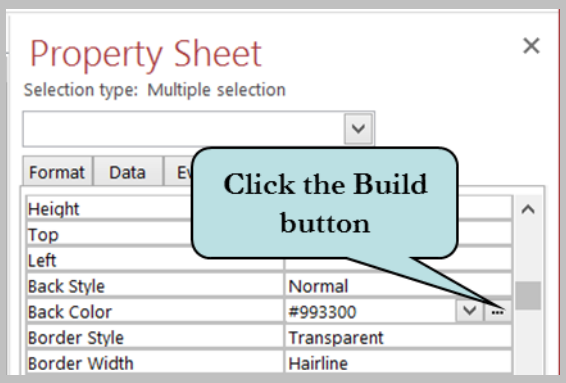
What	Why
	
11. Click in the **Decimal Places** box and select **2** from the drop-down list as shown.	Sets the number of decimal places to 2.
	
12. Click the **Close button** on the Properties Box.	Closes the Properties Box.
13. Click the **Text Box** tool on the Control group of the Design Ribbon.	Activates the Text tool.

What	Why
14. Click underneath the **Discount** box at the **4 inch mark** to insert an unbound text box as shown below.	Inserts an unbound text box to the underneath the Discount text box. 
15. Select the new text box and then click the **Property Sheet** button.	Displays the Properties for the new text box.
16. In the **Name** box, type: **DiscountTotal**	Enters a name for the Text box.
17. In the **Control Source** property, type: **=[Price] – [Discount]**	Creates a new calculated field that subtracts the Discount value from the Price value.
18. Click in the **Format** box.	Activates the Format property box and displays the drop-down arrow.
19. Click the drop-down arrow and select **Currency** from the drop-down.	Changes the format of the field to currency.
20. Click in the **Decimal Places** box and select **2** from the drop-down list.	Sets the number of decimal places to 2.
21. Click the **Label** for the new field.	Properties pane switches to properties for the label.
22. In the **Caption** box., type: **Total** and then press Enter.	Changes the text of the new label to Total.
23. Select the **Title** label.	Selects the first control whose properties we want to change.

What	Why
24. Hold down the **Shift** key and then select each label on the form until all labels are selected as shown below.	Select all labels on the form. We are going to change a property for all of the selected labels at once.



25. Click in the **Back Color** property box and then click the **build button** as shown below.	Opens the color palette allowing us to choose a background color.



26. Click on **Dark Blue (1st row, 4th column under Standard Colors)** as shown below. Click the **Close button** on the Property Sheet box.	Chooses dark blue as the background color for the selected labels.

What	Why
	
27. Click the **Save** button on the Quick Access toolbar.	Saves the design changes.
28. Click the **arrow** on the **View** button on the Ribbon and click **Form View**. Observe the changes.	Switches to Form View.

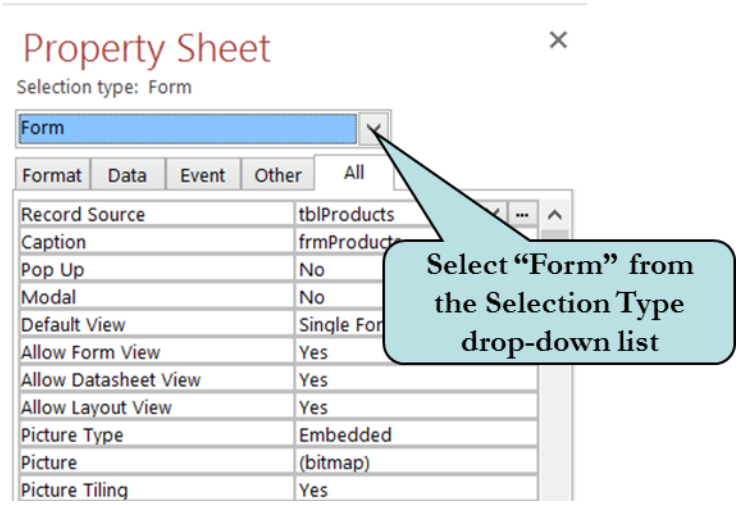
4.6 Changing Form Properties

In this lesson, you will learn how to change the properties of a form.

So far, we have been working with changing properties of a control, such as background color, caption, etc. **Forms**, just like controls, also have their **own set of properties** that you can modify.

For instance, you can change the properties of a form so that the scroll bars, record selectors, minimize and maximize buttons are not visible to the user. Or you can determine whether to allow edits, deletions or additions of records.

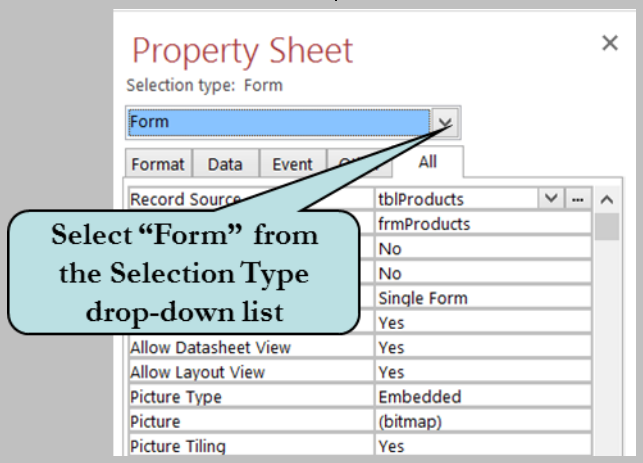
To display a form's **Property Sheet,** display the Property Sheet button for any control, click the Selection Type drop-down arrow and select Form from the list (you can also choose any control on your form from this list). You can also click on the gray area of the form and then click the **Property Sheet** button.

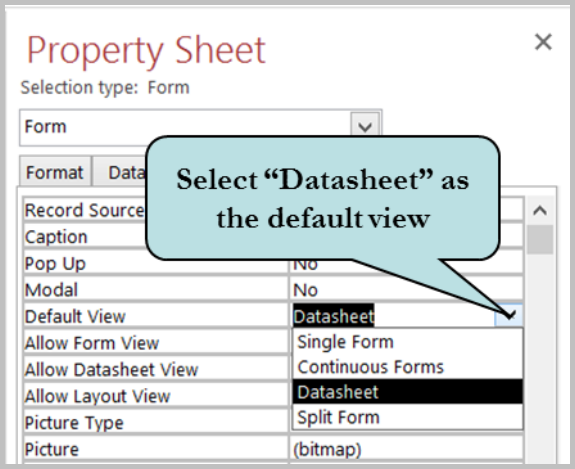
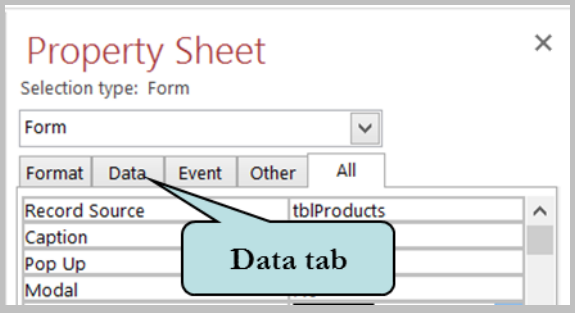


To Change the Properties of a Form

1. Open the form in Design View.
2. Click the **Property Sheet** button on the Ribbon.
3. Click the **Selection Type** drop-down arrow and select **Form** from the list.
   Or
   Click the gray area of the right side of the form and then click the Property Sheet button.
   Or
   Right-click anywhere on the form and choose **Form Properties** from the list.
4. Set the desired properties in the Property Sheet pane.

Let's Try It!

What	Why
1. Click the **arrow** on the **View** button and click **Design View**.	Switches to Design View.
2. If the Property Sheet is not displayed, click the **Property Sheet** button on the Ribbon.	Displays the Property Sheet.
3. Click the **Selection Type** arrow and choose **Form** from the drop-down list as shown below.	Displays the properties for the form.
	
4. Click in the **Default View** box.	Displays the arrow for the Default View property.
5. Click the arrow and then select **Datasheet** as shown below.	Selects Datasheet View as the default view for the form. The other options are Single Form (displays one record at a time on the form), Continuous Form (displays multiple records on the form), Split Form (that gives you two views of your data at the same time — a Form view and a Datasheet view) PivotTable or PivotChart.

What	Why
	
6. Click the **Data tab** on top of the Property Sheet window as shown.	Rather than display all of the properties for the form, we will display only those relating to data entry. This makes it easier to find the property for which you are searching.
	
7. Click in the **Allow Edits** box and then select **No** from the drop-down list.	Does not allow the user to make any changes to the existing data.
8. Click the **Close button** on the Property Sheet pane.	Closes the Property Sheet pane.
9. Click the **View** button on the Ribbon.	Displays the form in Datasheet View because we set Datasheet as the default view.

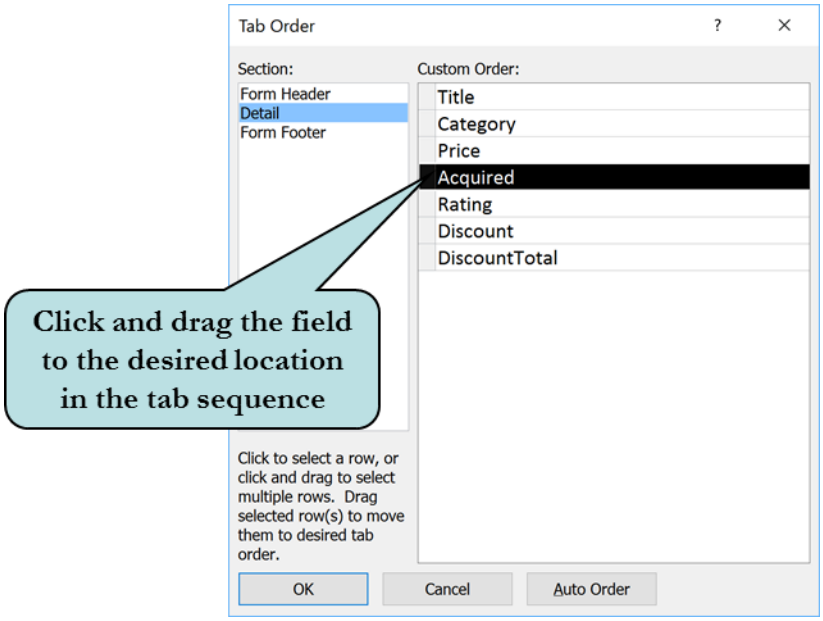
What	Why
10. Highlight the **Title** in the first record and then type: **Terminator 2**.	As we set the Allow Edits property to No, we are unable to make any changes to the data.
11. Click the arrow on the **View** button and click **Design View**.	Switches back to Design View.
12. Click the **Design** tab on the Ribbon and then click the **Property Sheet** button.	Displays the properties for the form.
13. Click the **Format** tab on the Property Sheet pane.	Displays form properties relating to formatting.
14. Click in the **Default View** box.	Displays the arrow for the Default View property.
15. Click the arrow and then select **Single Form**.	Sets Single Form as the default view for the form.
16. Click the **Property Sheet** button on the Ribbon.	Hides the Property Sheet from view.
17. Click the **Save** button on the Quick Access toolbar.	Saves the design changes.

4.7 Changing the Tab Order

In this lesson, you will learn how change the tab order of the fields on a form.

When entering data into a form, pressing the **Tab key** moves the insertion point from one field to the next. As you move fields around, add fields to or delete fields from your form, the tab order may no longer indicate the layout of the fields on your form. The tab order does not automatically change when you rearrange, add or delete fields.

To change the tab order of the fields in a form, click the **Design tab** on the Ribbon and then click the **Tab Order** box on the Tools group. The **Tab Order** box will then display. Click the small box to the left of the field whose tab order you want to change, then click and drag the field to the desired location in the tab sequence. As you drag, a black line appears informing you of the location of the field. You can also change the tab order by clicking the **Auto Order** button, which automatically rearranges the tab order to match the layout of the fields on the form. The Auto Order will move from left to right on the form, which may not always be what you want.

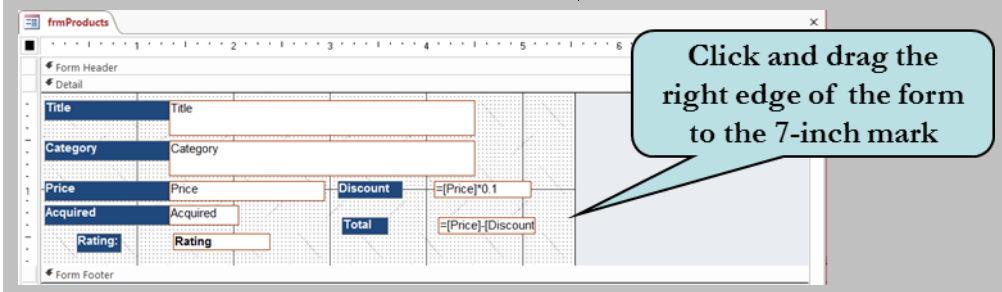


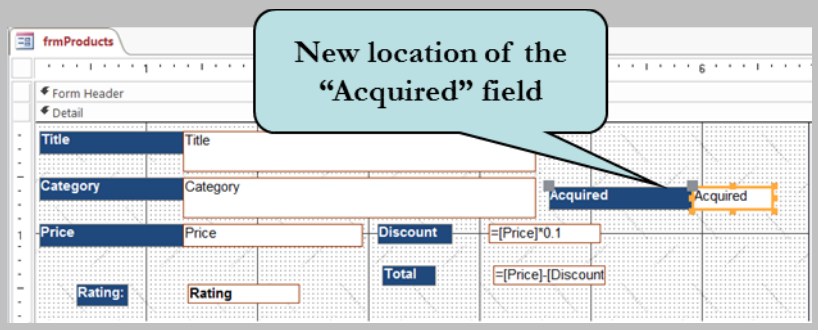
To exclude a control altogether from the tab order sequence (such as in the case of a calculated control), display the properties for the field you wish to exclude and then set the **Tab Stop** property to **No**.

To Change the Tab Order of a Form

1. Open the form in Design View.
2. Click the **Design tab** on the Ribbon.
3. Click the **Tab Order** button on the Tools group on the Ribbon.
4. Click the small box next to the field to select it.
5. Click and drag the field to the desired location in the tab sequence.
6. Repeat steps 4 and 5 for any additional fields you want to move.

Let's Try It!

What	Why
1. If the form is not maximized, click the **Maximize button**.	Maximizes the form in your screen.
2. Click the right edge of the form and then drag to the right to the 7 inch mark on the ruler as shown.	Increases the width of the form.
	
3. Click the **text box** for the **Acquired** field.	Selects both the text box and the label for the Acquired field.
4. Move your cursor over the border of the selected text box (anywhere except for a sizing handle) until the cursor transforms into a 4-way arrow.	Enters move mode.
5. Click and drag the text box and label for the Acquried field to the **right** of the **Category** field as shown.	Moves the text box and label for the Acquired field to the right of the Category field.

What	Why
	
6. Click the arrow on the **View** button and click **Form View**.	Switches to Form View.
7. Press **Tab 6 times** and observe the tab order.	The tab order does not correspond very well to the layout of the fields on the form.
8. Click the arrow on the **View button** and then click **Design View**.	Switches to Design View.
9. Click the **Design tab** on the Ribbon.	Ensures that the Design tab is the active tab.
10. Click the **Tab Order** button on the Tools group on the Ribbon.	Displays the Tab Order dialog box.
11. Click on the box to the left of **Acquired** field in the Tab Order box and release the mouse button. Click in the small box and then drag upwards until the black line is directly below Category.	Sets the Acquired as the next tab stop after the Category field.
12. **Release** the mouse button.	Completes the move action.
13. Click **OK**.	Closes the Tab Order box and applies the changes. Next, we will exclude our calculated fields from the tab sequence.

What	Why
14. Click the text box for the **Discount** field.	Selects the first field whose properties we wish to change.
15. Hold down the **Shift** key and then click the text box for the **Total** field.	Selects the second field whose properties we wish to change.
16. Right-click and then choose **Properties** from the contextual menu.	Displays the Property Sheet pane.
17. Click the **Other tab** on the Property Sheet pane.	Displays properties in the "Other" category.
18. Click in the **Tab Stop** property box and then set it to **No**.	Excludes the two selected fields from the tab sequence.
19. Click the **Close button** on the Properties Box.	Closes the Properties Box.
20. Click the arrow on the **View button** and then click **Form View**.	Switches to Form View.
21. Press the **Tab key 6 times** and observe the new tab order.	Tabs throughout the form. Notice that the calculated fields are now excluded and that Acquired field receives focus after the Category field.

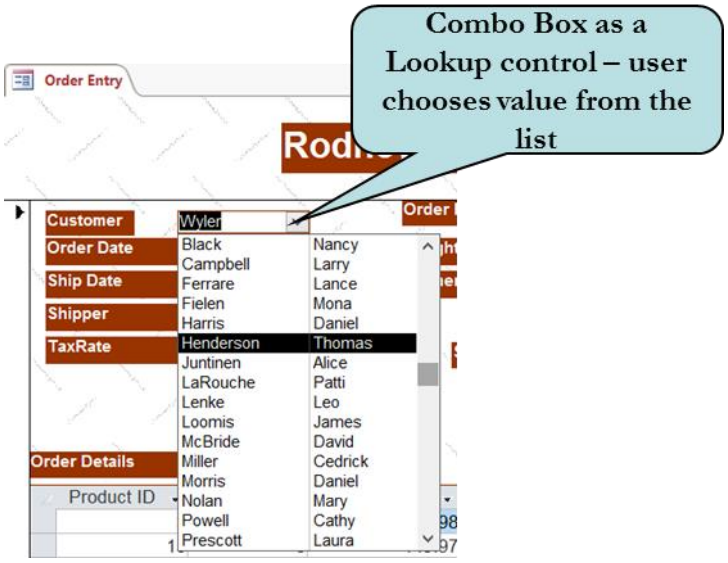
4.8 Adding a Lookup Control

In this lesson, you will add a lookup control to a form.

In an earlier lesson, we created a Lookup Field in a table that allowed you choose field data from a list of values, usually from a query or from another table. A **Lookup Control** works similarly to a Lookup Field in a table. A Lookup Control can be a combo box or a list box and allows the user to choose from list of values based upon another table or query or can be a value list - that is to say, a list of designated values from which the user can choose.

Before choosing a combo box or a list box as the control type, you will want to make sure that **Control Wizards** are activated. The Control Wizard helps you to create your lookup control by asking you a series of questions about what you want the control to do. For instance, you will have to decide where the list values will come from and what you want Access to do with that value after the user has chosen it (store the value in a particular field or use the value later by passing its value to another control).

You often will see combo boxes rather than list boxes used for lookup controls. An advantage of using a combo box is that they take up less room on a form as the list is not displayed until the user clicks the control. You can also control whether or not to allow values that are not part of the lookup list to be entered into the field.



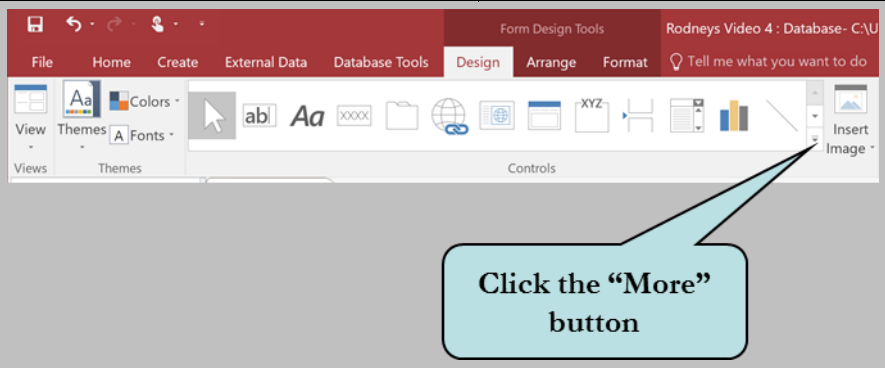
To Create a Lookup Control

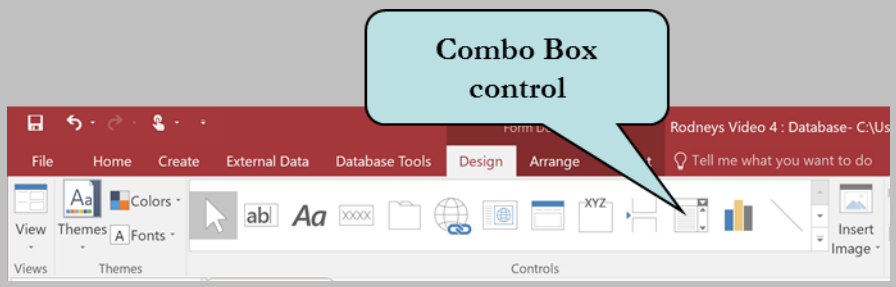
1. Select the form to which you want to add a Lookup field.
2. Switch to Design View.
3. Click the More button on the Controls group of the Ribbon and then click **Use Control Wizards** if it is not already activated.
4. Select the control you want to use from the Controls group and then place it in the desired location on the form.
5. Select the option that indicates you want the Lookup field to look up the values in a table or query.
6. Click **Next**.
7. Choose the table or query from where the lookup data will be retrieved.
8. Click **Next**.
9. Choose which field(s) are to be displayed in the Lookup List by selecting each field you want to include and then clicking the **>** button.
10. Click **Next**.
11. To sort your lookup list, click in the first blank combo box and select the field by which the list is to be sorted. Click in the next blank combo box to sort by another field. Repeat for up for four fields. Click the button to the right of the combo box to toggle the sort order (ascending or descending).
12. Click **Next** when finished choosing the sort fields.
13. Adjust the lookup columns to the desired width by clicking and dragging the column's right edge. Notice that the **Hide Key Column** is selected. Uncheck this box if you wish to display the Primary Key column (which most often is the bound column).
14. Click **Next**.

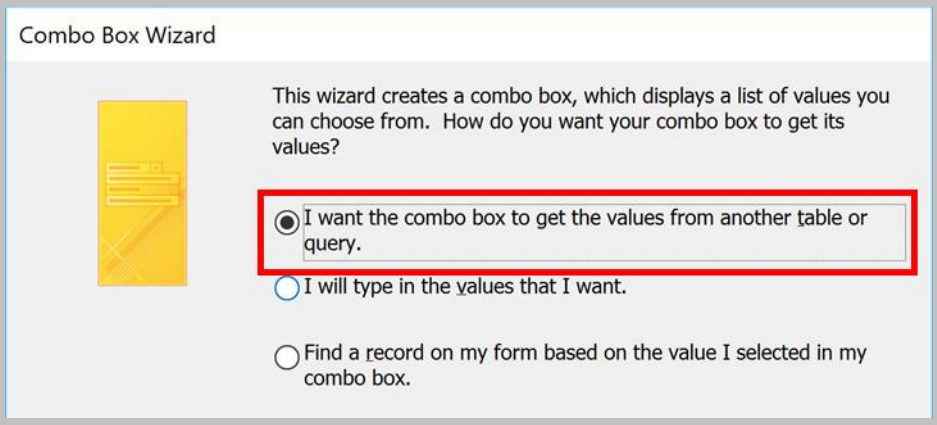
15. To store the selected value in a particular field, select **Store that value in this field** and then select the field where the value is to be stored from the drop-down list.
16. Click **Next**
17. Type the desired label for the Lookup column.
18. Click **Finish.**

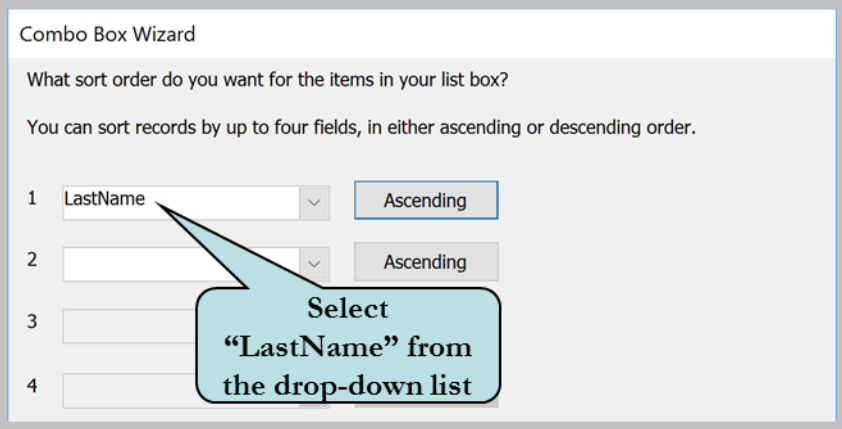
Let's Try It!

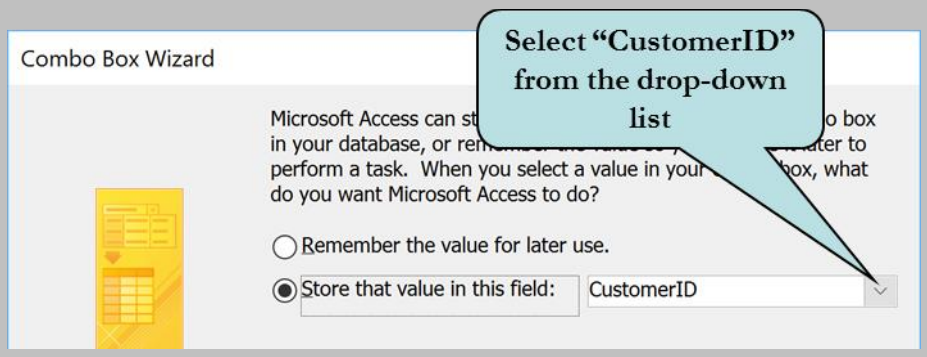
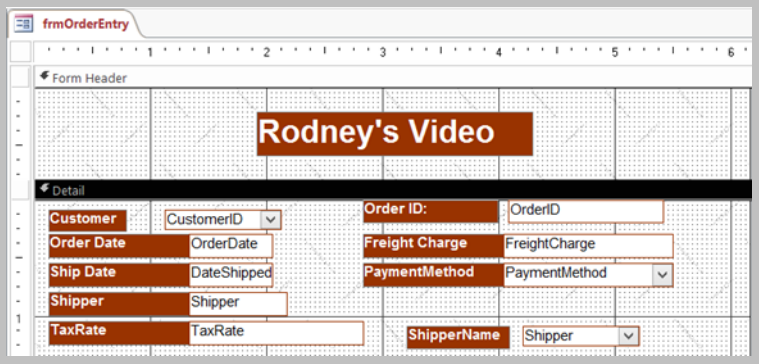
What	Why
1. Press the **Ctrl + W** keystroke combination. **Save** any changes.	Closes frmProducts.
2. Right-click on **frmOrderEntry** and then click **Design View**.	Opens frmOrderEntry in Design View. This form contains a subform (a form within a form), the many part of the relationship. We will learn about subforms in a later lesson.
3. Click the **text box** for the **CustomerID** field.	Selects the controls we want to delete. We are instead going to create a lookup control.
4. Press the **Delete** key.	Deletes the CustomerID text box and label.
5. Click the **More** button on the Controls group as shown below.	Displays additional Controls options.

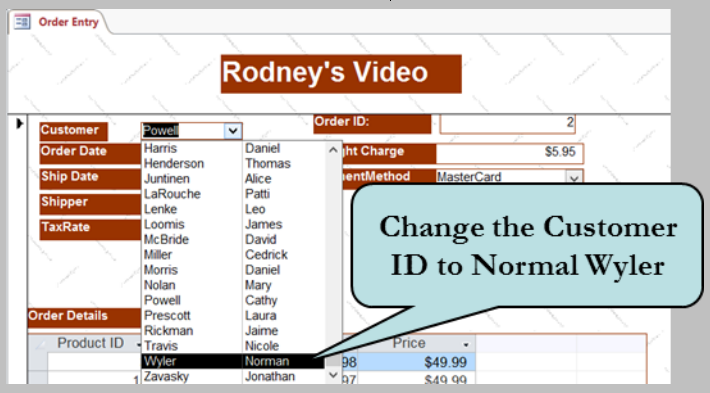


What	Why
6. If the **Control Wizard** button is not activated (lit) on the Ribbon, click it as shown below.	Activates the Control Wizard button. The control wizard will walk us through the process of creating a Lookup Control.
	
7. Click the **Combo Box tool** on the Controls group on the Ribbon as shown below.	Activates the Combo Box tool.
	
8. Click on the form directly above the **Order Date** text box at about the 1-inch mark.	Drops the control on the form and launches the Combo Box Wizard.
9. Make sure that **I want the combo box to look up the values from another table or query** is selected as shown below.	Sets the combo box to retrieve its list of values from a table or query.

What	Why
	
10. Click **Next**.	Moves to the next step of the Wizard.
11. Select **tblCustomers** and then click **Next**.	Selects the table from where the combo box will retrieve its values and then moves to the next step of the Wizard.
12. Select the **CustomerID** field and then click the **>** button**.**	Selects the CustomerID field to be added to the combo box.
13. Select **Last Name** then click the **>** button.	Selects the Last Name field to be added to the combo box.
14. Select **First Name** then click the **>** button.	Selects the First Name field to be added to the combo box.
15. Click **Next**.	Moves to the next step of the Wizard.
16. Click in the first blank combo box and select **LastName** as shown below.	Selects the first field by which we wish to sort in ascending order.

What	Why
	
17. Click in the next blank combo box and select **FirstName** from the drop-down list.	Selects the second field by which to sort in ascending order.
18. Click **Next**.	Moves to the next step of the Wizard.
19. Click **Next**.	We will leave the column widths as is and leave the key column (the CustomerID field) hidden from view. Moves to the next step of the Wizard.
20. Click the **Store that value in this field** radio button.	Sets the option to store the value that the user selects from the combo box in a particular field in the table upon which the form is based.
21. Click the arrow and then select **CustomerID** from the drop-down list as shown below.	Selects the CustomerID field as the field in the table where the value will be stored.

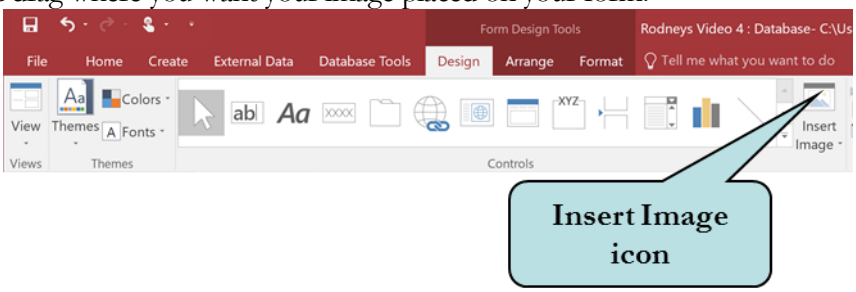
What	Why
	
22. Click **Next**.	Moves to the next step of the Wizard.
23. Type: **Customer** in the label box and then click **Finish.**	Sets Customer as the label for the combo box and then completes the Wizard.
24. Rearrange and/or resize the label and the combo box so that they are situated on the form as shown below. Remember that to move a control individually, click on the box on the top left corner of the control and then drag.	Rearranges the new controls on the form.
	
25. Click the arrow on the **View button** and click **Form View**.	Switches to Form View.

What	Why
26. Click on the arrow for the **Customer combo box** and then select **Norman Wyler** as shown below.	Changes the customer to Norman Wyler. Even though that Customer ID field is hidden from view, it is this value that is stored in the CustomerID ield, not the customer last name.
	
27. Click the **Save** button on the Quick Access toolbar.	Saves the design changes.

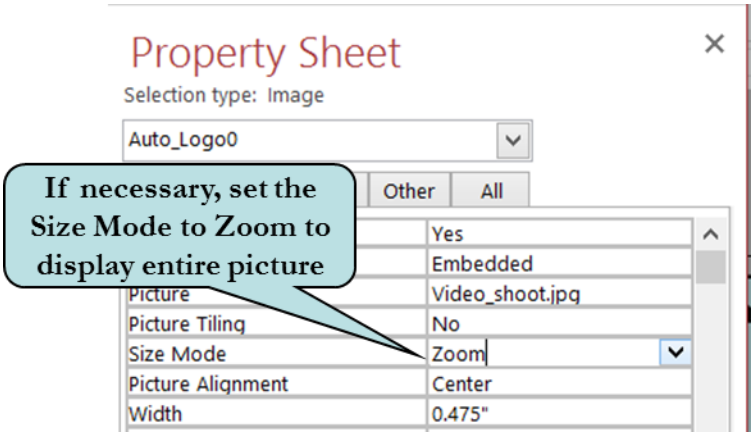
4.9 Inserting Graphics

In this lesson, you will learn how to insert pictures into your form.

Adding **graphics** can really add pizzazz to your forms. You can add a variety of different graphic file formats to your forms such as **.jpg, .gif, .bmp, .tif, and .wmf**. To add an image to your form, click the **Insert Image icon** on the Controls group on the Ribbon and click **Browse** to navigate to the folder where the image you want to insert is located. Next, select the image you want to insert and then click and drag where you want your image placed on your form.



Depending on the size of the image and the size of the image box that you drew on your form, some parts of your image may be cut off. If the object is larger than the control, the image may be clipped on the right and bottom by the control's borders. To remedy this problem, display the properties for the image object and then set the **size mode** to **Zoom**. This displays the entire graphic in the image object without distorting the proportions of the graphic. Most of the time, this should not be an issue as Access now by default, automatically sets the Size Mode to Zoom.

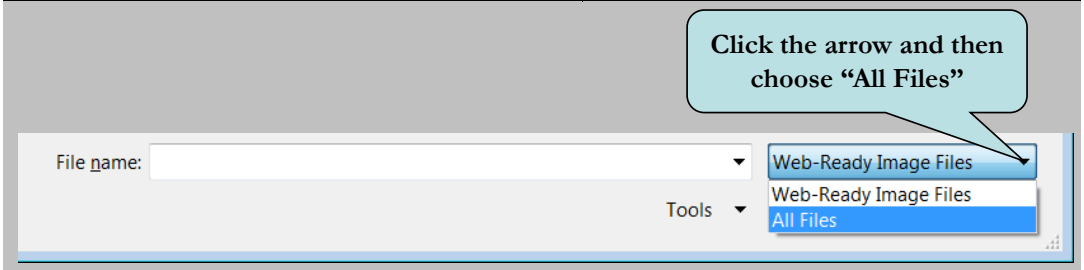


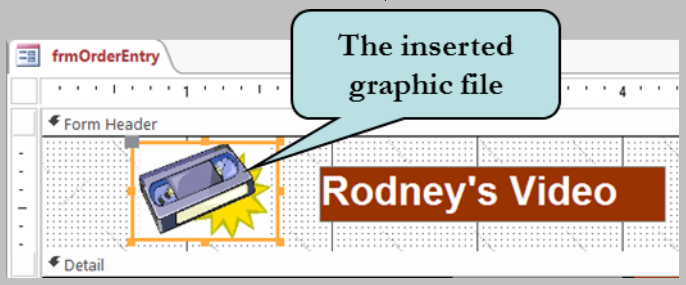
Tip: You can also insert a picture by clicking the **Logo** button on the Header/Footer group on the Ribbon. The picture will automatically be inserted in the Form Header.

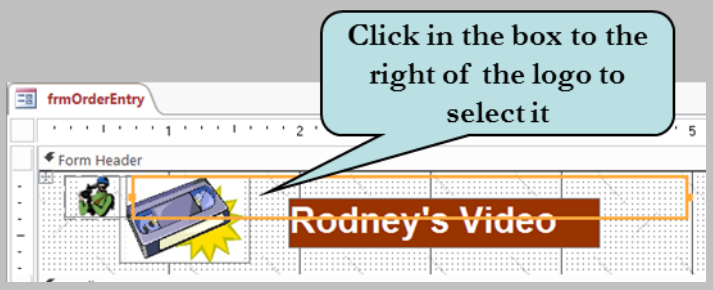
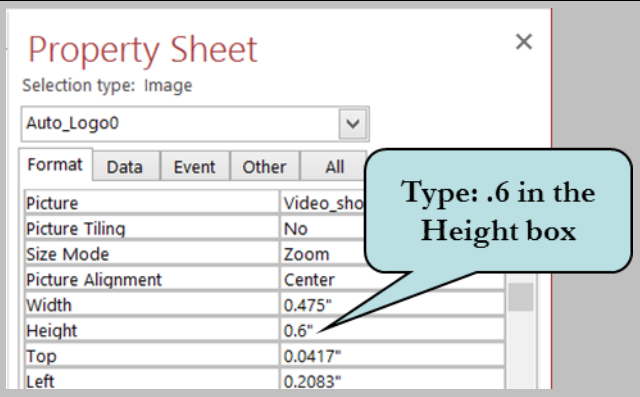
To Insert a Picture into a Form

1. Open the form into which you want to insert a graphic file.
2. Switch to **Design View**.
3. Click the **Insert Image** button on the Ribbon and click **Browse**.
4. Navigate to the folder that contains the image you wish to insert.
5. Select the graphic file and then click **OK**.
6. Click and drag on the form until the image box is the desired size.
7. If the image appears clipped:
   a. Select the image.
   b. Click the Property Sheet button.
   c. Click in the **Size Mode** property box.
   d. Select **Zoom** from the drop-down list.

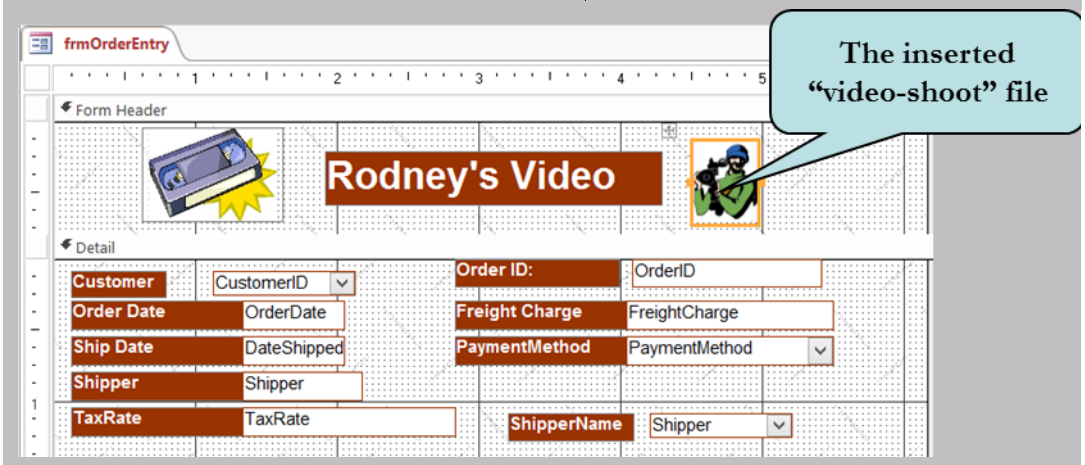
Let's Try It!

What	Why
1. Click the arrow on the **View button** and click **Design View**.	Switches to Design View.
2. Click on any white area of the form to deselect any selected controls. Then, click the **Insert Image** button on the Controls group of the Ribbon and then click **Browse**.	Displays the Insert Picture dialog box.
3. Click the drop-down arrow to the right of the **File Name** box on the bottom of the window and choose **All Files** as shown below.	Sets the option to display all files, not only Web-Ready images.
	
4. Click **Desktop** button on the left side of your screen.	Opens Desktop folder.

What	Why
5. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
6. Select the **video_cassette** file and then click **OK**.	Selects the file we wish to insert.
7. In the Form Header, draw an image box about **1 inch high by 1 inch wide** to the left of the Rodney's Video label.	Sets the size of the image and then inserts the image.
	
8. Click the **Logo** button on the Ribbon.	Displays the Insert Picture dialog box. By using the Logo tool, the image we select will automatically be inserted into the Form header.
9. Click the drop-down arrow to the right of the **File Name** box and choose **Graphics Files**.	Sets the option to display all graphics files.
10. Click **Desktop** on the left side of your screen.	Opens Desktop folder.
11. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
12. Select the **video_shoot** file from the Lesson Files folder and then click **OK**.	Inserts the graphic file named video_shoot into the Form Header.

What	Why
13. **Click in the box** to the right of the video_shoot graphic to select it as shown below.	As we do not need a tagline box, we will delete it.
	
14. Press the **Delete** key.	Deletes the text box.
15. Click the new image and then click the **Property Sheet** button.	Displays the Property Sheet for the video_shoot image.
16. Click the **Format tab** in the Property Sheet box.	Displays Format properties.
17. Select all the text in the height box and type: **.6** as shown below. Click the **Close** button on the Property Sheet box when finished.	Increases the height of the image and then closes the Property Sheet box.
	

What	Why
18. Click and drag the new image so that it is situated to the right of the Rodney's Video label as shown below.	Repositions the video_shoot graphic.



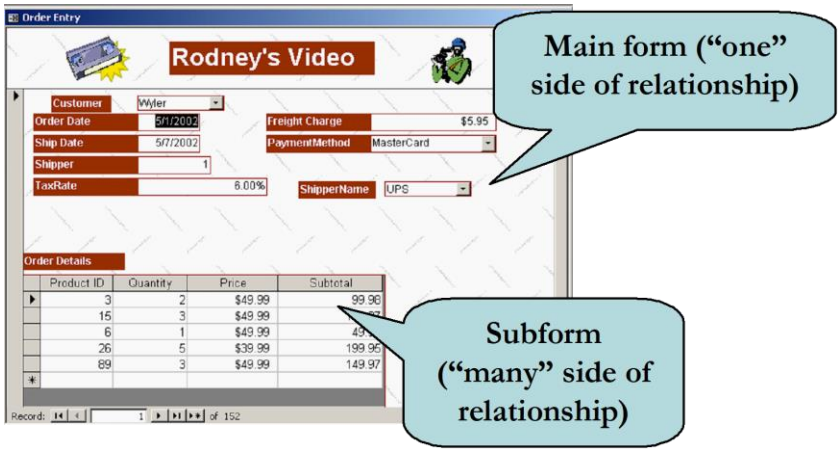
19. Click the arrow on the **View button** and click **Form View**.	Switches to Form View.

4.10 Creating a Subform

In this lesson, you will learn how to create a form within a form.

A **subform** is a form that is inserted into another form. The primary form is called the **main form** or **parent form** and the form within the main form is referred to as the **subform**. Subforms are used when you want to display data from or enter data into tables or queries with a one-to-many relationship. A classic example of this is the Customers table (the "one" side of the relationship) and the Orders table (the "many" side of the relationship). The main form displays the "one" side of the relationship and the subform displays the "many" side of the relationship.

The main form and subform are linked (usually by the Primary Key in the main form and the Foreign Key in the subform) so that the subform only displays records that are related to the main form. Using the Customers/Orders relationship as an example, when the main form displays a particular customer, only orders for that customer are displayed in the subform.



You can create a subform by using the **Subform/Subreport tool** on the toolbox after your main form has been created or you can create both forms at the same time. In this lesson, we are going to assume that you will create both the main form and subform at the same time using the Form Wizard.

Note: Before creating a Main Form/Subform, a relationship must already exist between the two tables.

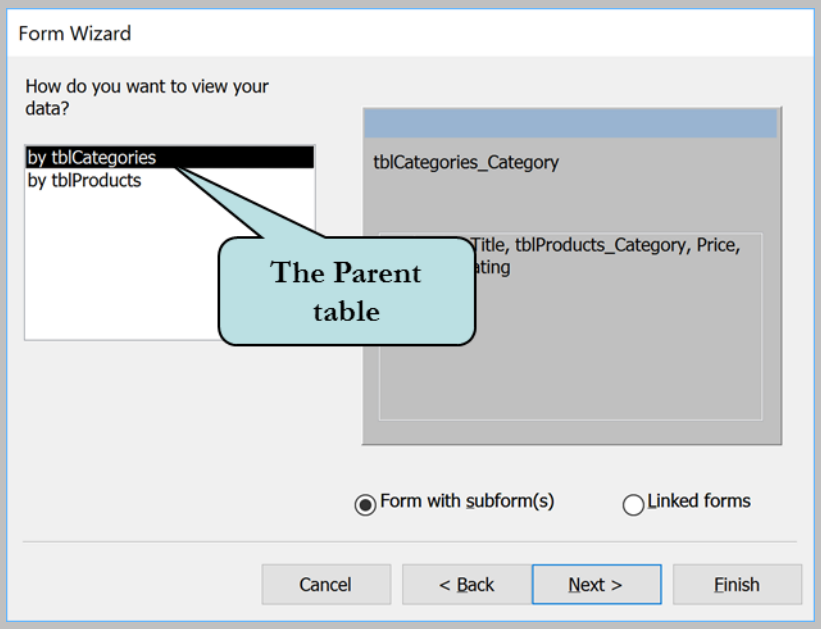
To Create a Subform

1. Click the **Create tab** on the Ribbon.
2. Click the **Form Wizard** button on the Ribbon.
3. In the **Tables/Queries** combo box, select the first table or query to add. This will be for the parent part of the form.
4. Select the fields to be added to the form by selecting each desired field and then clicking the **>** button.
5. In the same wizard dialog box, select the second table or query to add from the **Tables/Queries** combo box. This will be the child part of the form.
6. Select the fields to be added to the form by selecting each desired field and clicking the **>** button.
7. Click **Next**.
8. Select how you want to view your data. Typically, you would choose the Parent table.
9. In the same wizard dialog box, select the **Form with subform(s)** option.
10. Click **Next**.
11. Choose the desired layout for the subform (datasheet is often used).
12. Click **Next**.
13. Type a name for your form and subform in the appropriate text boxes.
14. Click **Finish**.

Let's Try It!

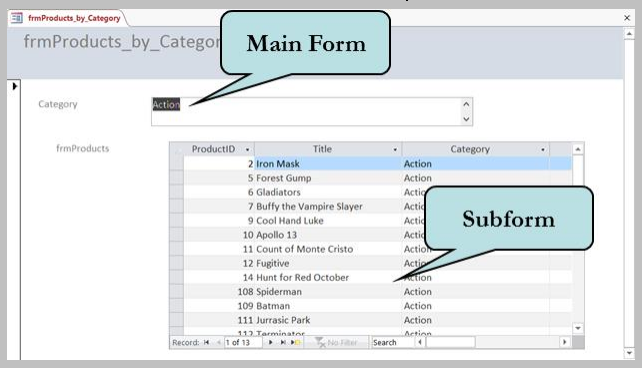
What	Why
1. Click the **Close button** on frmOrderEntry. Click **Yes** if asked to save your changes.	Closes frmOrderEntry.
2. Click the **Create tab** on the Ribbon.	Displays Create tools and options.
3. Click the **Form Wizard** button on the Ribbon.	Launches the Form Wizard.
4. From the **Tables/Queries** drop-down box, scroll up and then select **tblCategories**.	Selects the Parent table (the "one" side of the relationship).
5. Select **Category** and then click the **>** button.	Adds the Category field to the form.

What	Why
6. In the same wizard dialog box, select the **tblProducts** from the **Tables/Queries** combo box.	Adds the Child table (the "many" side of the relationship).
7. Click the **>>** button.	Adds all of the fields from tblProducts.
8. Click **Next**.	Moves to the next step of the Wizard.
9. Make sure the option to view the data by **tblCategories** is selected and that **Form with subform(s)** is selected as shown below.	Sets the option to create a form with subform, with tblCategories as the Parent Form.

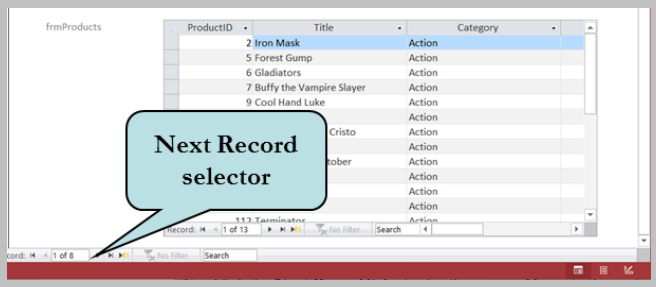


10. Click **Next**.	Moves to the next step of the Wizard.
11. Select **Datasheet** for the layout of the subform and then click **Next**.	Selects the layout of the subform and then moves to the next step of the Wizard.

What	Why
12. In the **Form** box, type: **frmProducts_by_Category.**	Sets the name and title of the Main Form (or Parent form).
13. In the **Subform** box, type: **frmProductsSubform**.	Sets the name and title of the Subform (or Child form).
14. Click **Finish**.	Displays the form in Form View. The main form displays a category, in this case "Action" and the subform displays all films of that category.



15. Click the **Next Record Selector** for the Main Form as shown below.	Moves to the next record. The category as well as the related records changes.



16. Click the **Close button** on the Form window.	Closes the Form/Subform.
17. Click the **File tab** and click **Close** from the File Options pane.	Closes the database.

Lesson Summary – Working with Forms

- In this lesson, you learned how to show or hide a Page Header, Page Footer, Form Footer and Form Header on forms by right-clicking on any data bar and then clicking Page Header/Footer or Form Header/Footer from the contextual menu.
- Then, you worked with form controls such as text boxes and labels. You learned how to add controls to forms from the Controls group on the Design Ribbon.
- Next, you learned that when you select a control, small boxes called sizing handles appear around the control. To change the length or height of a control, move your cursor over the desired sizing handle until it transforms into a double black arrow, then click and drag until the control is the desired size. To move a control, position your mouse pointer over the border of the control until the pointer transforms into a 4-way arrow, click and then drag the control to the desired location.
- Next, you learned that you can perform calculations in forms by adding a Calculated control to your form - an unbound control (usually a text box) whose value is determined by an expression such as =[Subtotal] + [Tax]. To create a calculated control, type the expression directly into an unbound text box or enter the expression in the Control Source Property of the Property Sheet pane.
- Next, you learned that changing the properties of a control allows you to change the look of the control. You can change the font size, font style, font color, number of decimal places, caption, and alignment just to name a few via the Property Sheet Pane. To display the Property Sheet Pane, select the object and then click the Property Sheet button on the Tools group of the Design Ribbon. You can also double-click any object to display its Property Sheet or right-click on the object and then choose Properties from the pop-up menu.
- Next, you learned how to change the properties of a form. For instance, you can change the properties of a form so that the scroll bars, record selectors, minimize and maximize buttons are not visible to the user. Or you can determine whether to allow edits, deletions or additions of records. To display the form's Property Sheet, click the Property Sheet button for any control, click the drop-down arrow next to Selection Type and select Form from the list (you can also choose any control on your form from this list).
- Next, you learned how to change the tab order of the controls on your form using the Tab Order dialog box. Click the Design tab on the Ribbon and then click the Tab Order box on the Tools group. Click the small box to the

left of the field whose tab order you want to change, then click and drag the field to the desired location in the tab sequence

- Next, you learned how to use a Lookup Control (usually a combo box or list box) which allows the user to choose from list of values based upon another table or query or from a value list - that is to say, a list of designated values from which the user can choose. To use a Lookup Control, make sure the Control Wizard button on the Ribbon is activated, add the control to your form and then follow the instructions of the control wizard.
- Next, you learned how to insert graphics into your form by using the Insert Image control on the Design Ribbon. Click the Image button, select the image you want to use and then click and drag on the form until the image box is the desired size. You also learned that you can also insert a picture by clicking the Logo button on the Controls group. The picture will automatically be inserted in the Form (or Report) Header.
- Lastly, you learned how to insert a subform into your form; that is to say, a form that is inserted into another form. The primary form is called the main form or parent form and the form within the main form is referred to as the subform. Subforms are used when you want to display data from or enter data into tables or queries with a one-to-many relationship. To insert a subform, use the Subform Control on the Controls group of the Design Ribbon or launch the Form Wizard and add both tables or queries during the wizard process.

Lesson 4 Quiz

1. When creating a new form, the Form Header and Form Footer are automatically displayed.
   A. True
   B. False

2. To show or hide the Form header and footer, you:
   A. Click the Form Header/Footer button on the Controls group of the Design Ribbon.
   B. Click the Form Header/Footer button on the Show/Hide group of the Arrange Ribbon.
   C. Right-click any section bar in the form and choose Form Header/Footer from the menu.
   D. Click the View tab on the Ribbon and then click the Form Header/Footer button.

3. When you select a control, _____ (fill in the blank) appear around the control which allow you to change the width or height of the control.

4. What are two ways to add a calculation to an unbound control?

5. You want to add a calculated to control to add together the Price and the Tax fields on your form. What calculation would accomplish this?

6. To display the properties for a control, you (select all that apply):
   A. Click the control to select it and then click the Control Properties button on the Controls group of the Design Ribbon.
   B. Click the control to select it and then click the Property Sheet button on the Tools group of the Design Ribbon.
   C. Double-click on the border of the control.
   D. Click the control to select it and then click the Label button on the Controls group of the Design Ribbon.

7. How can you change the tab order of the controls on your form?
   A. Click the Tab Order tab on the Ribbon, click the Tab Order box on the Order group and then drag the fields to the desired position.
   B. Click the Design tab on the Ribbon, click the Control Order box on the Layout group and then drag the fields to the desired position.
   C. Click the Design tab on the Ribbon, click the Tab Order box on the Tools group and then drag the fields to the desired position.
   D. Display the Property Sheet for the form, click the Tab Order build button and then drag the fields to the desired position.

8. What types of controls are usually used for Lookup Controls (select all that apply)?
   A. Text Boxes
   B. Combo Boxes
   C. Labels
   D. List Boxes

9. Before you can use the Wizard to add a Lookup Control to a form, you must first activate the _____ button.

10. What control allows you to insert an image in the Detail area of your form?
    A. The Logo Control
    B. The Image Control
    C. The Picture Control
    D. The Graphic Control

11. You can add a subform to your form by using the Subform control as well as using the Form Wizard.
    A. True
    B. False

12. Why might you want to add a subform to a form?

LAB 4 – ON YOUR OWN

1. Open the **Lab4** database in the Lesson Files folder.
2. Use the Form Wizard to create a form that includes all the fields from the Students table. Choose **Columnar** for the layout. Name the form: **frmStudentEntry**.
3. Switch to **Design** view and then maximize the form. Expand the **Form Header** area so that it is about an inch high. Delete the existing label in the Form Header area. Add a new label with the text: **Student Entry Form**. Display the **properties** for the label and change the **Font Size** to **22.** Expand the size of the label so that all of the text is visible. Move the label so that it is centered within the header.
4. Change the Properties of the StudentID field so that it is not a tab stop. Close the form and save your design changes.
5. Open **frmStudentClasses** in Form View and then tab through the form to observe the tab order. Change the tab order to the following sequence:

   StudentID
   FirstName
   LastName
   Major
   Address
   City
   State
   Zip
   Phone
   tblStudentClasses Subform

   Test the new tab order. Save and close the form.
6. Open **frmClasses** in Design View. Add a text box and label below the Class Cost field. Create a calculated field in the new text box that adds a $20 student fee to the Class Cost. Change the text of the label to read: **Total with Student Fee** and change the Format of the field to **Currency** with 2 decimal places. Rearrange/resize the label if necessary to display all of the data. Save and close the form.
7. Create a new Form/Subform using the Form Wizard to show a list of classes for each department. Use **tblDepartment** as the Parent form and **tblClasses** as the Child form. Add all of the fields from tblClasses View the data by tblDepartment and set the layout of the Subform to datasheet. Name the

Parent form "**frmClasses_By_Department**" and name the Subform "**frmClasses_By_Department_Subform**." Switch to Design View and change the label in the form header to read: **Classes by Department**.

8. Close the form.

9. Close the database.

Lesson 5

Lesson 5 - Working with Reports

Lesson Topics:

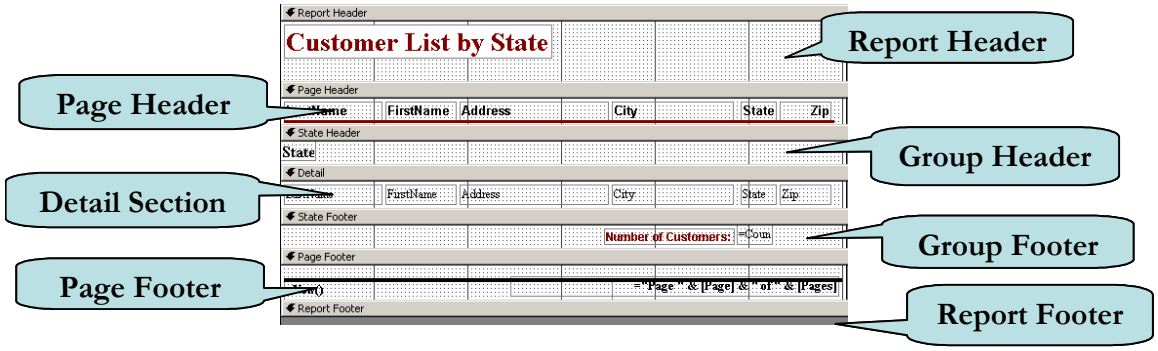
5.1 Working with Report Sections

In this lesson, we will look at the various sections of a report.

Like forms, changes to your report are made in Design View. If we look at a report in Design View, we can see that the report is broken down into separate **sections**. Each section prints in the order in which it appears.

The report sections are:

- **Page Header** – information in this section appears on the top of each printed page of the report. Often, column headings are placed in this section.
- **Page Footer** – information in this section appears on the bottom of each printed page of the report. Often, page numbers are placed in this section.
- **Group Header** – information placed in this section appears at the beginning of each new group of records. Often, the group name is placed in this section.
- **Detail –** where most of the report field data appears.
- **Report Header-** information in this section appears on the first printed page of the report. Often, the title of the report or a company logo is placed in this section.
- **Report Footer** – information in this section appears on the last printed page of the report. Often, grand total fields are placed in this section.
- **Group Footer –** Information placed in this section appears at the end of each group of records. Often, summarizing fields such as subtotals are placed in this section.



If the Report Header/Footer or Page Header/Footer is not visible, right-click on any of the gray section bars and then click **Page Header/Footer** button or **Report Header/Footer** button to toggle it on or off.

Before adding controls such as text boxes or labels to a report section, you may need to **resize the section first.** To resize a report section, move your mouse pointer over the

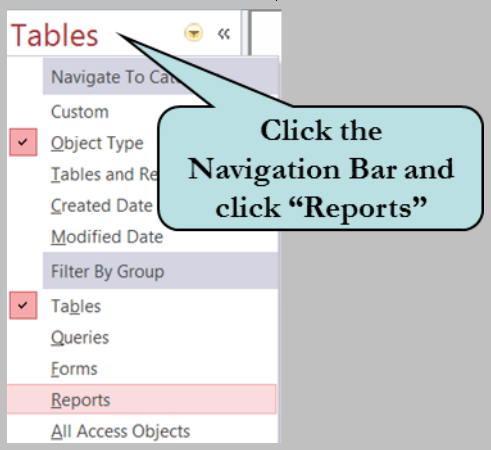
bottom edge of the section until the pointer transforms into a **black cross with a vertical double arrow,** and then drag downwards until the section is the desired size.

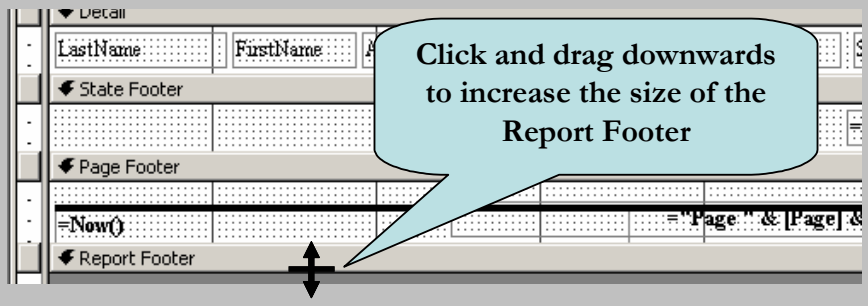
To View Report Sections

1. Click the Navigation Bar and then choose Reports from the list to display report objects.
2. Right-click the report whose sections you want to view and then click the **Design View**.
3. To display or hide a report header/footer, right-click on any of the gray section bars and then click **Report Header/Footer** button to toggle it on or off.
4. To display or hide a page header/footer, right-click on any of the gray section bars and then click **Page Header/Footer** button to toggle it on or off.
5. To resize a report section, move your mouse pointer over the bottom edge of the section until the pointer transforms into a **black cross with a vertical double arrow,** and then drag downwards until the section is the desired size.

Let's Try It!

What	Why
1. Click the **File** tab on the Ribbon.	Displays Backstage view.
2. Click **Open.**	Displays the Open pane.
3. Click the **Browse** button in the center pane.	Displays the Open window.
4. Click **Desktop** on the left side of your screen.	Displays the Desktop folder.
5. Double-click the **Lesson Files** folder.	Opens the Lesson Files folder and displays the files in that folder.
6. Select the **Rodneys Video 5** file and then click **Open**.	Opens the Rodneys Video 5 database.

What	Why
7. Click the **Navigation Bar** and then click **Reports** as shown below.	Displays report objects.
	
8. Double-click the report named **rptCustomerListByState**.	Opens rptCustomerListByState in Print Preview mode.
9. Click anywhere on the report.	Zooms in on the report data.
10. **Right-click** on the Report and click the **Design View**.	Switches to Design view.
11. Click the **Maximize button** on the report window.	Maximizes the report to full screen.
12. Position your mouse pointer over bottom border of the **Report Footer** until the mouse pointer transforms into a **black cross with a vertical double arrow** as shown below. Click and then drag downwards until the Report Footer is about one inch tall.	Increases the size of the Report Footer to about one inch.

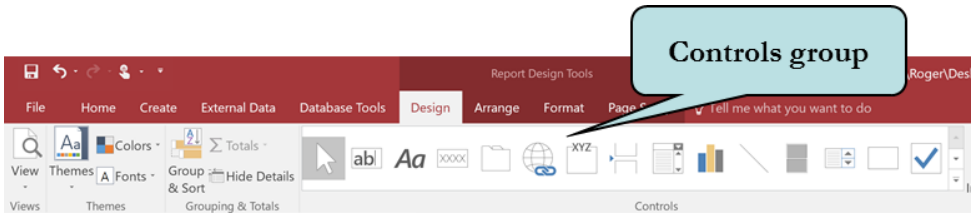
What	Why
	
13. Click the **Save** button on the Quick Access toolbar.	Saves the Design changes.

5.2 Adding Controls to a Report

In this lesson, you will learn how to add controls to a report.

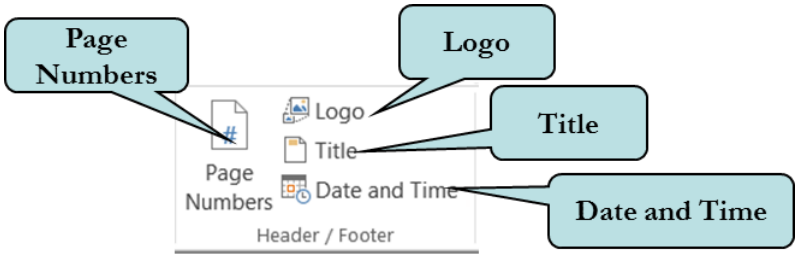
From working with forms, you are already familiar with many of the **controls** that you can add to a report – labels, text boxes, graphics, lines, combo boxes, list boxes, etc. Controls such as combo boxes or list boxes are rarely used on reports because you cannot actually change data on a report. Reports are used for displaying and printing data only.

You can add a control to a report by clicking the control you wish to use on the **Controls group** of the Design Ribbon and then dragging it on the report. To display a Smart Tab that informs you of the name of a control, position your mouse pointer over any control on the Ribbon.



Controls group on the Design Ribbon

A handy group of controls, located in the Header/Footer group to the right of the Control group, allows you to insert a Logo, Report Title, Page Numbers and the Date or Time. Access will automatically insert these fields for you when creating a report with the Report Wizard. However, if you create a report from scratch, you will need to add these fields manually. They are added to the report (or form) header or footer by default.



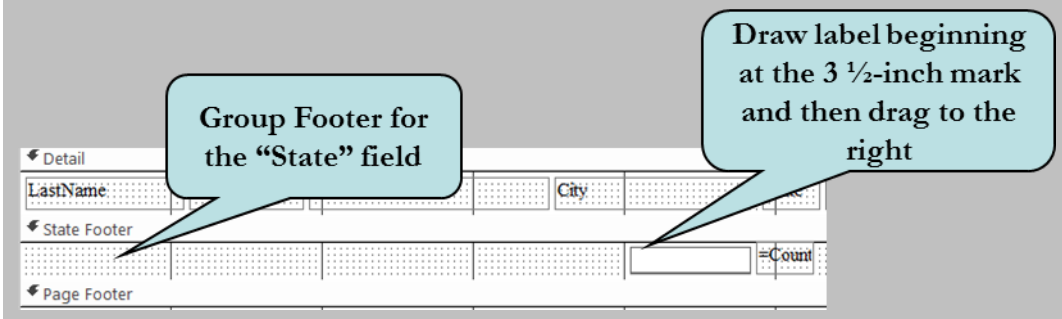
To Add a Control to a Report

1. Open the report in Design View.
2. If necessary, click the Design Tab on the Ribbon.
3. Click the control on the Controls group that you want to add to your report.
4. Drag the control on the desired location of your report.

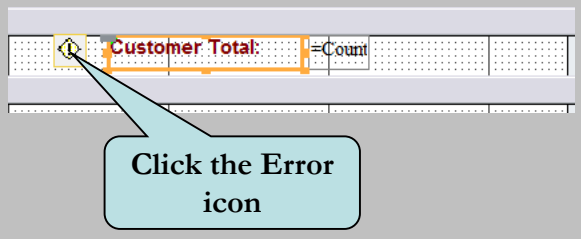
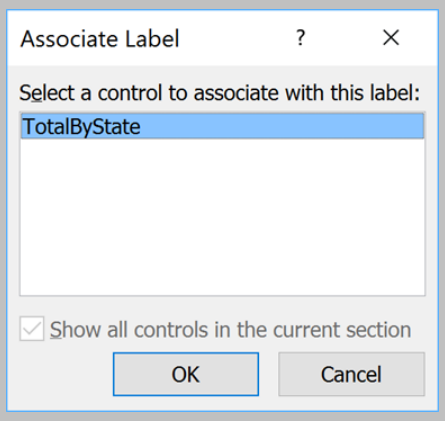
Let's Try It!

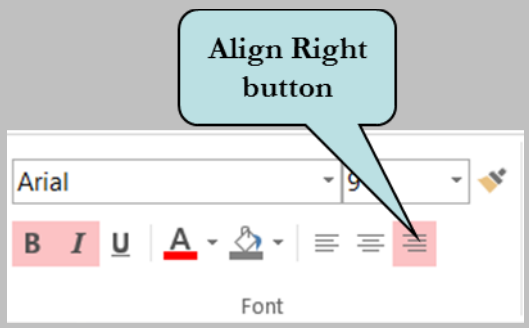
What	Why
1. If necessary, click the **Design tab** on the Ribbon.	Switches to Design commands and tools.
2. Click the **Label** tool as shown below.	Activates the Label tool. We are going to add a label to the Group Footer for the State field.

3. Click your left mouse button at the 3 ½ inch mark in the Group Footer for the **State** field and then **draw a box to the right** about ½ inch tall by 1 ½ inches long as shown below.	Inserts a label control to the left of the text box in the Group Footer for the State field.



4. Type: **Customer Total:** and then press **Enter**.	Enters the text for the label. Because the label control is not associated with a control, a small error box appears.
5. Click the **Error icon** to the left of the label as shown below.	Displays error options

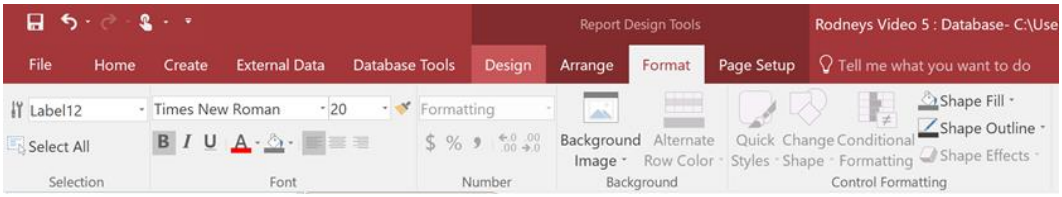
What	Why
	
6. Click **Associate Label with a Control** from the list.	Displays the Associate Label dialog box.
7. Click **TotalByState** as shown and then click **OK**.	Associates the new label with the TotalByState control. 
8. Click the **Format tab** on the Ribbon.	Displays formatting tools and commands.
9. With the label still selected, click the **Align Text Right** button on the Font group on the Ribbon as shown below.	Right aligns the text in the label.

What	Why
	
10. Click the **Design tab** on the Ribbon.	Displays Design tools and commands.
11. Click the **View button** on the Ribbon and then click **Layout View**.	Displays the report as it will print.
12. Click the **Design tab** on the Ribbon.	Displays the Design tab.

5.3 Changing Control Properties

In this lesson, you will learn how modify the properties of a control on a report.

Many control properties of forms and reports can be modified by clicking on the appropriate button on the **Font group** of the contextual **Format Ribbon**. If you have worked with other Microsoft applications, you will already be familiar with many of these features. The contextual Format Ribbon is illustrated below:



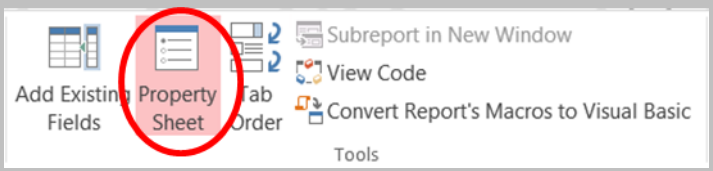
Format Ribbon

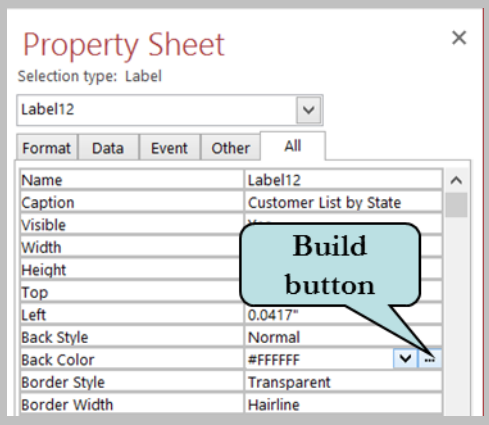
Additional properties not found on the Format Ribbon can be modified via the **Property Sheet Pane**. To display the Property Sheet Pane, select the object and then click the **Property Sheet button** on the Tools group of the Design Ribbon. You can also **double-click** any object in Design View to display its Property Sheet or **right-click** on the object and then choose Properties from the pop-up menu.

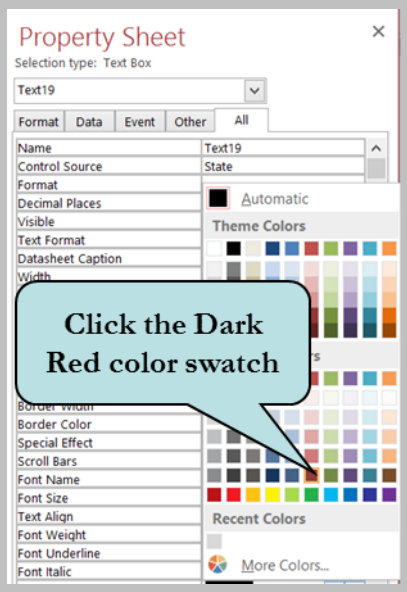
To Change the Properties of a Control

1. Select the control(s) whose properties you wish to change.
2. Select the desired icon on the Font group on the Format Ribbon.
3. For properties not found on the Ribbon:
   a. Select the control(s) whose properties you wish to change.
   b. Click the **Property Sheet button** on the Design Ribbon.
      Or
      Double-click the object to display its Property Sheet
      Or
      Right-click and then choose **Properties** from the pop-up menu.
   c. Enter the desired changes in the Property Sheet Pane.

Let's Try It!

What	Why
1. Click the **View button arrow** on the Design tab of the Ribbon and click **Design View**.	Switches to Report Design View.
2. Select the **label** in the **Report Header** (Customer List by State).	Selects the control whose properties we want to change.
3. Click the **Format tab** on the Ribbon.	Displays the Format Ribbon.
4. Click the **Font Size** drop-down list on the Ribbon and then select **36**.	Changes the font size of the label text to 36.
5. Double-click any of the **sizing handles** of the label.	Automatically adjusts the size of the label to accommodate the text.
6. Click the **Italic** button on the Font group on the Ribbon.	Applies italic formatting to the label text.
7. Click the **Design tab** on the Ribbon.	Displays the Design Ribbon.
8. Click the **Property Sheet** button on the Tools group on the Ribbon as shown below.	Displays the Property Sheet Pane for the selected control.
	
9. Click the **All tab** on the Property Sheet Pane.	Displays all available properties for the label box control.

What	Why
10. Scroll down until you see the **Special Effect** property (below Border Color). Click in the property box and then select **Raised** from the drop-down list.	Applies a raised effect to the label.
11. Click in the **Back Color** box and then click the **Build Button** as shown below.	Selects the Back Color property and opens the color palette.
	
12. Select **Light Gray** (3rd row, 1st column) under Standard Colors.	Applies a background color of light gray to the label.
13. Click the **text box** in the **State Header** section for the **State** field.	Selects the control whose properties we wish to modify. The Property Box now displays properties for the State control.
14. Scroll down until you see the **Fore Color** property. Click in the Property Box and then click the **build button**.	Displays the color palette.
15. Click the **dark red** color swatch (Maroon 5) as shown below.	Sets the Fore Color to dark red.

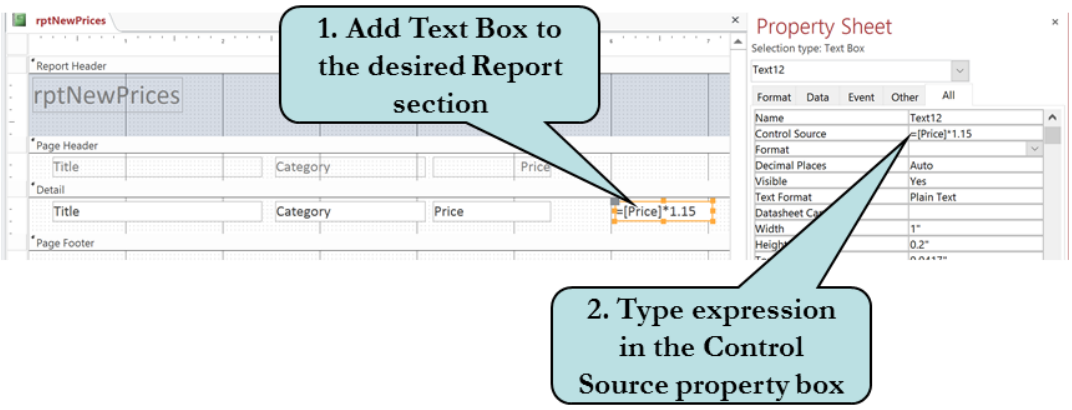
What	Why
	
16. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.
17. Click the **arrow** on the **View** button and the click **Print Preview.** Observe the changes.	Displays the report in Print Preview view.
18. Click the **Close Print Preview** button on the Ribbon.	Returns us to Design View.
19. Click the button on the **Property Sheet button** on the Ribbon.	Closes the Property Sheet pane.

5.4 Creating a Calculated Control

In this lesson, you will learn how to create a calculated control in a report.

We have already seen how to create a **calculated field** in a form by typing in an expression in the control source property of an unbound text box. Luckily, creating calculated controls in reports works the same way. Calculated controls are especially useful in Group footers to calculate subtotals and totals.

When adding a calculated control to a report, you can pretty much count on having to rearrange and resize your existing controls as reports built with the report wizard often leave you little room for adding new controls.



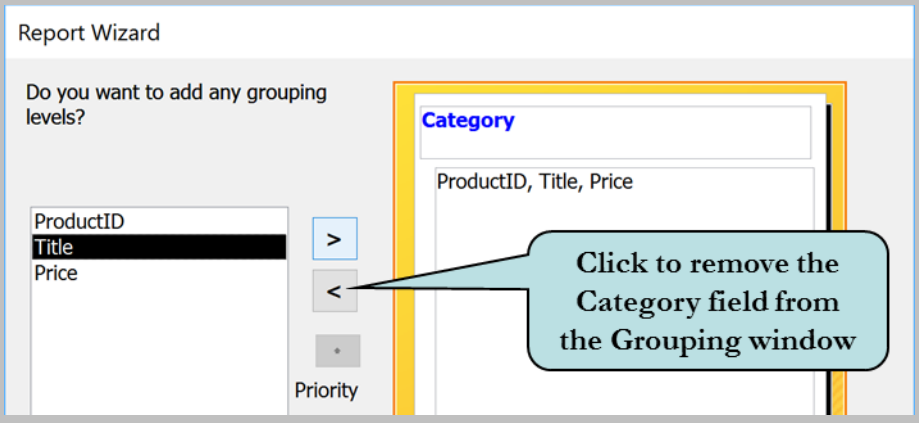
To Create a Calculated Field on a Report

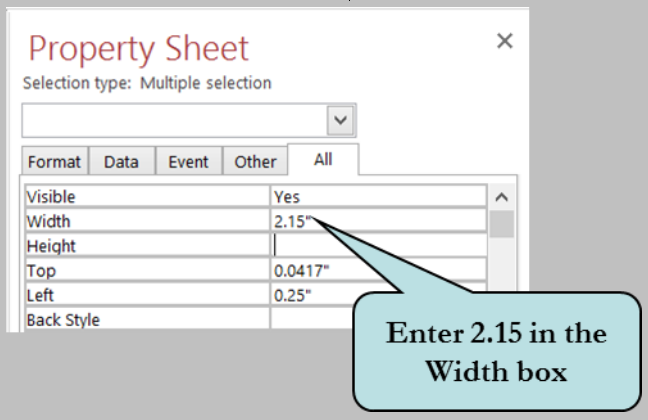
1. Open the Report in Design view.
2. Click the Text Box Tool on the Controls group of the Design Ribbon.
3. Click in the section and location where you want to place the calculated control.
4. Place the insertion point in the text box and type the expression.
   Or
   Select the text box, click the **Property Sheet** button on the Tools group of the Design Ribbon and then type the expression in the **Control Source** property box.

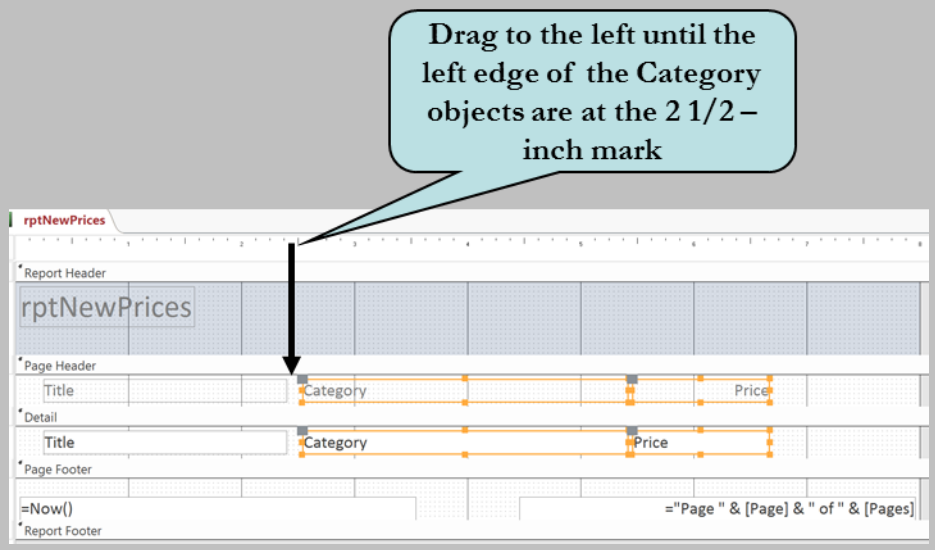
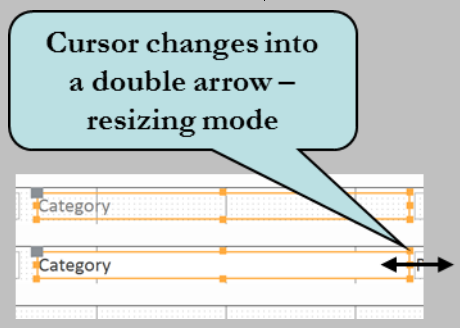
The Let's Try It! Exercise will also reinforce previously learned skills of moving and resizing controls.

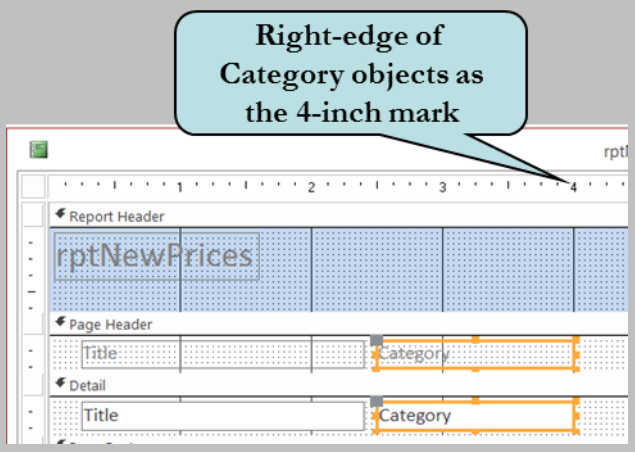
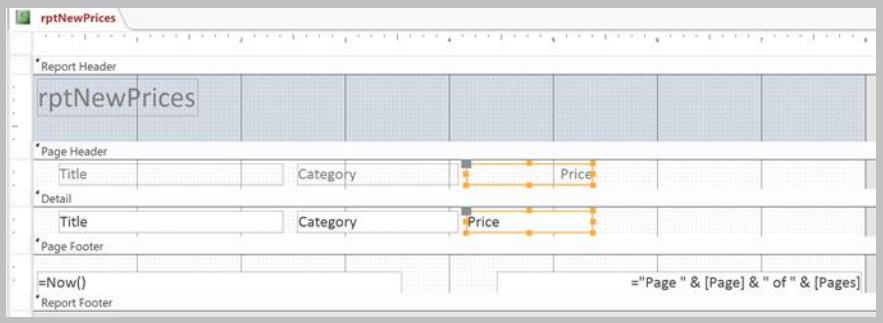
Let's Try It!

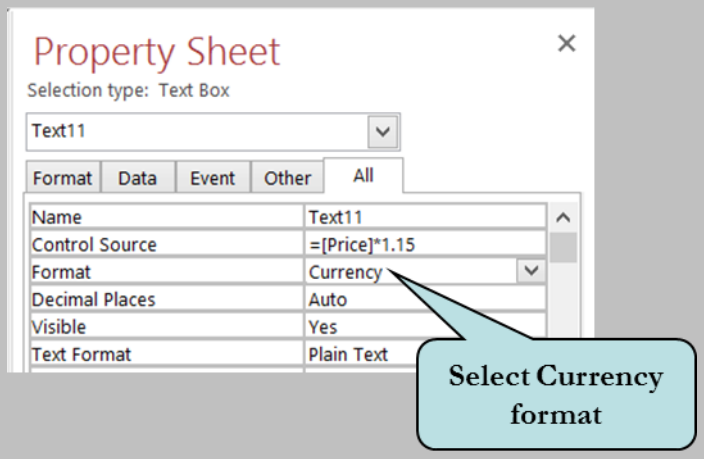
What	Why
1. Press the **Ctrl + W** keystroke combination. Click **Yes** when asked to save your changes.	Closes the active report.
2. Click the **Create tab** on the Ribbon.	Switches to Create commands and tools.
3. Click the **Report Wizard** button on the Reports group.	Launches the Report Wizard.
4. Select **tblProducts** from the **Tables/Queries** drop-down list.	Chooses tblProducts as the data source for our report.
5. Select the **ProductID** field and then click the **>** button.	Add ProductID to the report.
6. Select the **Category** field and then click the **>** button.	Add Category to the report.
7. Select the **Title** field and then click the **>** button.	Add Title to the report.
8. Select the **Price** field and then click the **>** button.	Add Price to the report.
9. Click the **Next** button.	Moves to the next step of the Wizard.
10. Click the **<** button as shown below.	Access automatically placed the **Category** field as a grouping field. For our purposes, we do not want any grouping so we will remove the Category field from the grouping window.

What	Why
	
11. Click **Next**.	Moves to the next step of the Wizard.
12. Click the arrow in the first combo box and then select **Title**.	Sets our report to sort by Title. This will override any sorting at the query level.
13. Click **Next**.	Moves to the next step of the Wizard.
14. Click **Next**.	We will accept the default layout and orientation settings and then move to the next step of the Wizard.
15. Type: **rptNewPrices** in the Title Box and then click **Finish**.	Provides a title and file name for the report and then opens the report in Print Preview view.
16. Click the **Close Print Preview** button.	Switches to Design View.
17. Select the **ProductID label** in the Page Header section, hold down the Shift key and select the **ProductID text box** in the Detail section.	Selects the ProductID label and text box. We decided that we do not need these fields on the report so we will delete them.
18. Press the **Delete key**.	Deletes the selected label and text box from the report.

What	Why
19. Select the **Title label** in the Page Header section, hold down the **Shift key**, and then select the **Title** text box in the Detail section.	Selects the Title label and Title text box.
20. Click the **Property Sheet** button on the Ribbon.	Displays the Properties for both the Title text box and label.
21. Change the value in the **Width box** to: **2.15** as shown below. Press **Enter**.	Changes the width of the Title label and text box to 2.15.
	
22. Click the **Close** button on the Property Sheet pane.	Closes the Property Sheet pane.
23. Select the **Category label**, hold down the **Shift key**, and then select the **Category text box**, the **Price label** and the **Price** text box.	Selects the Category label, Category text box, Price label and Price text box. We are going to move both controls.
24. Move your mouse pointer over the **Price** text box until the pointer transforms into a **4-way arrow**. Click and drag to the left until the left edges of the Category label and text box are at the 2 ½ inch mark as shown below.	Moves the objects to the left.

What	Why
	
25. Click anywhere on the white area of your report.	Deselects the controls.
26. Select the **Category label**, hold down the **Shift key**, and then select the **Category text box**	Selects the Category label and the Category text box.
27. Move your cursor over **the right center sizing handle** of the label until the cursor transforms into a **double arrow pointer** as shown below.	Enter resizing mode. We are going to reduce the length of the Category label and text box to about one inch.
	

What	Why
28. Click and drag to the left until the right edge of the Category label & text box is at the 4-inch mark as shown below.	Reduces the size of the Category label and text box.
	
29. Select the **Price label**, hold down the **Shift key**, and then select the **Price text box**.	Selects the Price label and text box. We are going to move them both to the left.
30. Move your mouse pointer over the **Price** text box until the pointer transforms into a **4-way arrow**. Click and drag to the left until both the label and text box are at about the 4 ½-inch mark as shown below.	Moves the Price label and text box to about the 4 ½-inch mark.
	
31. Click the **Text Box** tool on the Controls group of the Ribbon.	Activates the Text Box tool.

What	Why
32. Click in the **Detail Section** at the **6 inch** mark.	Drops a text box and label in the detail section.
33. Click on the border of the label that was placed in the detail section and then press the **Delete key**.	Deletes the label from the Detail section. We will add another label later to the Page Header section.
34. **Double-click** the **Text Box.**	Displays the Property Sheet pane for the selected text box.
35. Click in the **Control Source** box and then type: **=[Price] * 1.15**. Press **Enter**.	Calculates a new price based on a 15% increase.
36. Click in the **Format** property box, click the arrow and select **Currency** as shown below.	Selects Currency as the display data format.
	
37. Click the **Property Sheet button** on the Ribbon.	Closes the Property Sheet Pane.
38. Click the **Label tool** on the **Toolbox**.	Activates the Label Tool.
39. Click in the **Page Header Section** at the **6 inch** mark.	Inserts a label in the Page Header section at the 6 inch mark.

What	Why
40. Type: **New Price**	Enters text for the label.
41. Click anywhere in the white area of the Page Header section.	Deselects the label. Notice that the formatting is different than the other labels. Often, it's easier to copy and paste and existing label and then change the caption rather than adding a new label object.
42. If necessary, move the label so that it is lined up with the other controls.	Moves the label to line it up with the other control.
43. Resize the label so that it is the same length as the calculated control.	Resizes the label.
44. Click the **Format tab** on the Ribbon.	Displays the Format Ribbon.
45. Click the **Align Text Right** button on the Font group of the Ribbon.	As Currency formatted fields are right-aligned by default, we will right-align our label as well.
46. Click the **Save** button on the Quick Access Toolbar.	Saves the design changes.
47. Click the **Design tab** on the Ribbon.	Displays the Design Ribbon.
48. Click the **View button** and then click **Print Preview.** Observe the report.	Displays the report in Print Preview mode.

5.5 Changing a Control's Data Source

In this lesson, you will learn how to change the Data Source of a Control on a Report.

In the last section, we added a calculated control to our report. A calculated control uses an expression as its source of data. There are three main types of controls that you can add to your forms or reports:

1. **Bound Controls –** Bound controls are tied to a field in an underlying table or query. Bound controls are used to view, enter or update data from the fields in your database.
2. **Unbound Controls** – Unbound controls do not have a data source. That is to say, they are not tied to any field in a table or query. Examples of unbound controls are labels, lines, and rectangles.
3. **Calculated Controls –** Calculated controls use an expression as their data source. Although an expression uses data from the underlying table or query, calculated controls are technically unbound as they cannot change data in your query or table.

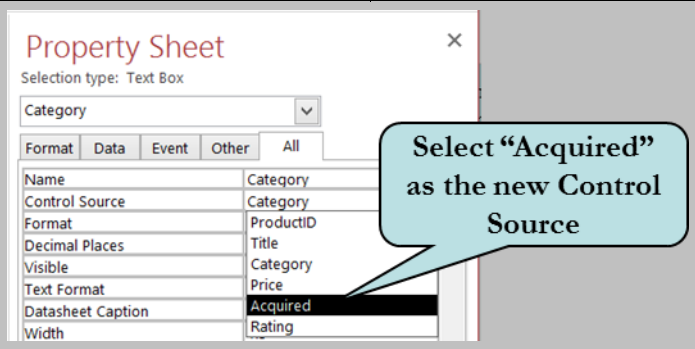
You can change the data source of a control by modifying its **Control Source Property**. Clicking on the arrow in the Control Source Property box displays all of the fields in the underlying query or table upon which the report or form is based. Selecting a data source from the list changes the control's data source. Or, instead of selecting a control source from the list, you can **type an expression** in the Control Source Property box and transform your control into a **calculated control**.

To Change a Control's Data Source

1. Display the Report in Design view.
2. Display the properties for the control whose data source you wish to change.
3. Click in the **Control Source** box.
4. Select a field from the drop-down list as the control's new data source.
   Or
   Type an expression in the Control Source box to create a calculated control.

Let's Try It!

What	Why
1. Click the **Close Print Preview** button.	Returns to Design View.
2. Click the **Category Text Box** in the **Detail Section**.	Selects the control whose data source we want to change.
3. Click the **Property Sheet** button.	Displays the properties for the Category text box.
4. Click the **All** tab in the Property Sheet windows.	Displays all properties for the Category text box.
5. Click in the **Control Source** property box.	Displays the arrow for the Control Source which, when clicked, will display a list of all available underlying fields.
6. Click the Control Source property **arrow** and then select **Acquired** from the drop-down list as shown below.	Change the Control Source property of the text box to the Acquired field.



7. Click the **Category Label** in the **Page Header Section**.	Selects the Category label. We need to change the caption of our label so it corresponds to the text box below it.

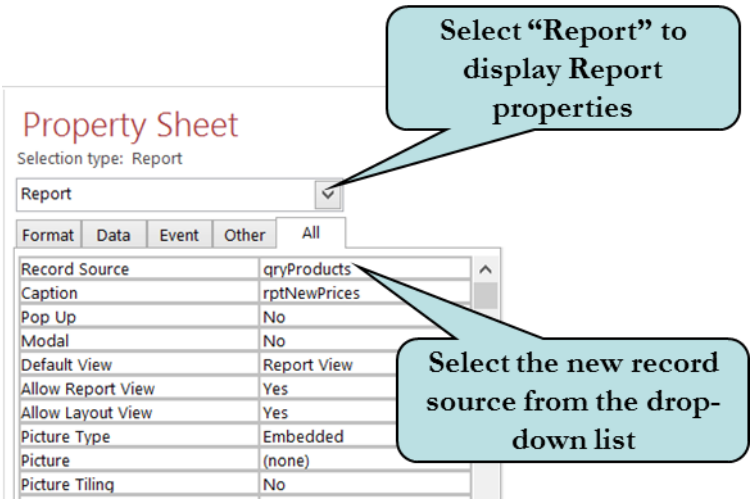
What	Why
8. Double-click in the **Caption** property box in the Property Sheet pane and then type: **Date Acquired**. Press **Enter**.	Changes the label text to "Date Acquired"
9. Click the **arrow** on the **View button** and then click **Print Preview.** Observe the changed fields.	Displays the report in Print Preview mode.
10. Click the **Close Print Preview** button.	Returns to Design View.
11. Click the **Property Sheet** button on the Ribbon.	Hides the Property Sheet.

5.6 Changing a Report's Data Source

In this lesson, you will learn how to change the Data Source of a Report.

Even after you have created your report, you can change its data source. That is to say, you can change the underlying table or query upon which the report is based. For instance, you may have initially created your report from a table but later decide you would rather base it upon a query to take advantage of the excellent filtering capabilities of queries.

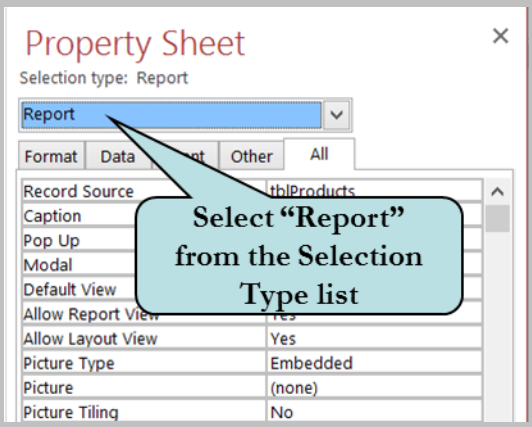
To change a report's data source, display the **Property Sheet** for any control, click the Selection type drop-down arrow and select Report from the list (you can also choose any control on your report from this list). Then, then change the **Record Source property.** But keep in mind that if the field names are different in the new data source, you will receive error messages when attempting to display your report.

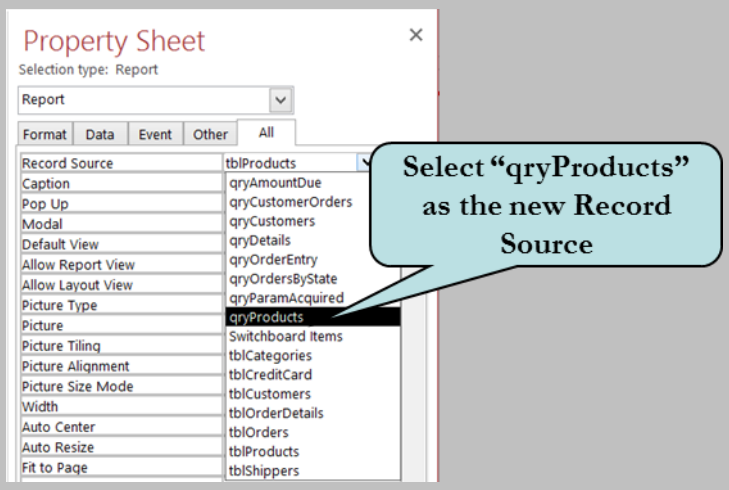


To Change the Data Source of a Report

1. Open the report in **Design** view.
2. Click the **Property Sheet** button on the Ribbon.
3. Click the **Selection Type** drop-down arrow and select **Report** from the list.
   Or
   Click the gray area of the report below the Report Footer and then click the Property Sheet button.
4. Click in the **Record Source** property box.
5. Click the arrow and then select the new Data Source from the list of tables and queries.

Let's Try It!

What	Why
1. Click the **Property Sheet** button on the Ribbon.	Displays the Property Sheet.
2. Click the **Selection Type** arrow and choose **Report** from the drop-down list as shown below.	Displays the properties for the report.
	
3. Click in the **Record Source** property.	Displays the Records Source arrow, which when clicked, will display a list of all tables and queries in the database.
4. Click the arrow and then select **qryProducts** from the drop-down list as shown below.	Selects **qryProducts** as the new Data Source for the report.

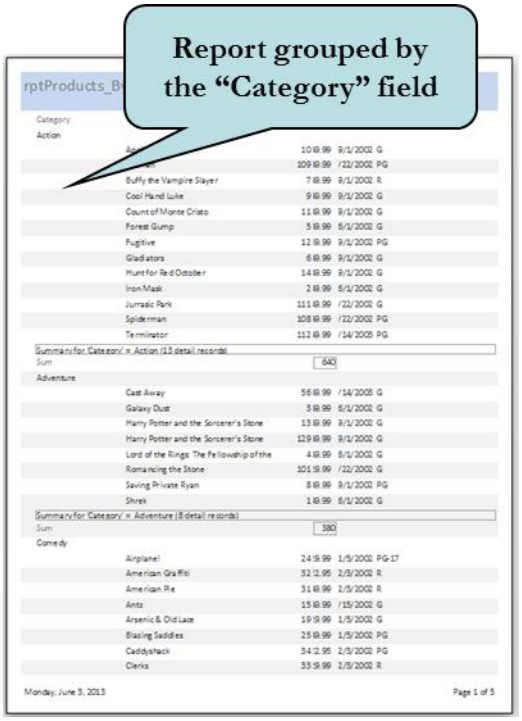
What	Why
	
5. Click the **Save** button.	Saves the design changes.
6. Click the **arrow** on the **View button** and then click **Print Preview.**	Displays the report in Print Preview mode.
7. Click the **Close button** on the Report window.	Closes the report.

5.7 Sorting and Grouping Data

In this lesson, you will learn how to sort and group data in a report.

When creating a report with the Report Wizard, you have the option of **grouping records**. Grouping records allows you to keep like records together, based on the values of one or more fields. Using our Products table as an example, we could create a report that grouped the records by the Category field, thus allowing us to look at all records for a specific category.

Within each group, you can then sort by one or more fields. Another option provided by the Report Wizard is the ability to calculate **totals** and other values for each group.



To Sort and Group Data

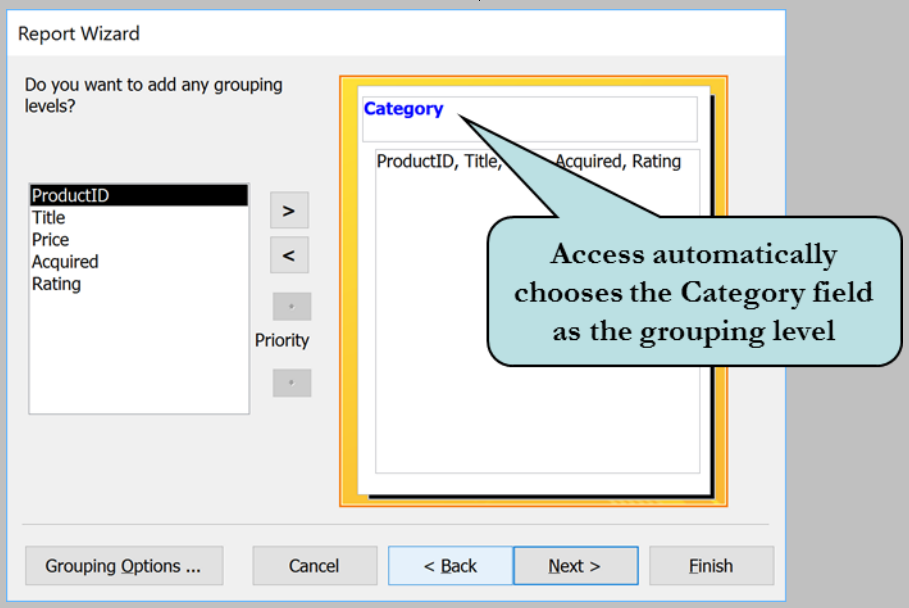
1. Click the **Create tab** on the Ribbon.
2. Click the **Report Wizard** button on the Report group.
3. Choose the table or query upon which you want to base your report from the **Tables/Queries** drop-down list.
4. Add the fields you want to include in your report by selecting each field and then clicking the **>** button.

5. Click **Next**.
6. To add **grouping levels**, select the field by which you wish to group and then click the **>** button. Repeat for any additional fields for which you wish to create a grouping level.
7. In the first combo box, select the field by which you want to **sort** your report. To sort by more than one field, select the desired fields in the additional combo boxes.
8. To add a calculation for your group:
   a. Click the **Summary Options** button.
   b. Click the desired aggregate function(s) (Sum, Average Min, Max) next to each field for which you want to add a group calculation.
   c. To show both detail data and summary data, select **Detail and Summary**.
   d. To show only summary data, select **Summary Data**.
   e. To calculate each subtotal sum as a percentage of the total, select **Calculate percent of total for sums**.
   f. Click **OK**.
9. Click **Next**.
10. Select the desired **Layout** and **Page Orientation**.
11. Click **Next**.
12. Click **Next**.
13. Type the desired name for your report.
14. Click **Finish**.

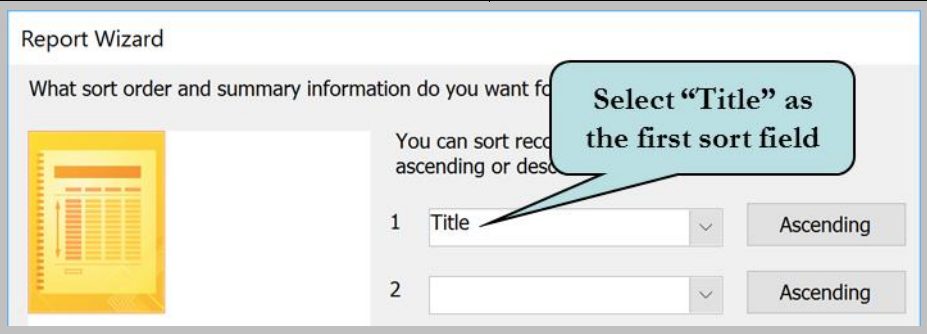
Let's Try It!

What	Why
1. Click the **Create tab** on the Ribbon.	Displays report creation tools and commands.
2. Click the **Report Wizard** button on the Reports group.	Launches the Report Wizard.
3. Select **qryProducts** from the **Tables/Queries** drop-down list.	Selects the query upon which our report is to be based.
4. Click the **>>** button.	Adds all fields to the report.
5. Click **Next**.	Moves to the next step of the Wizard.

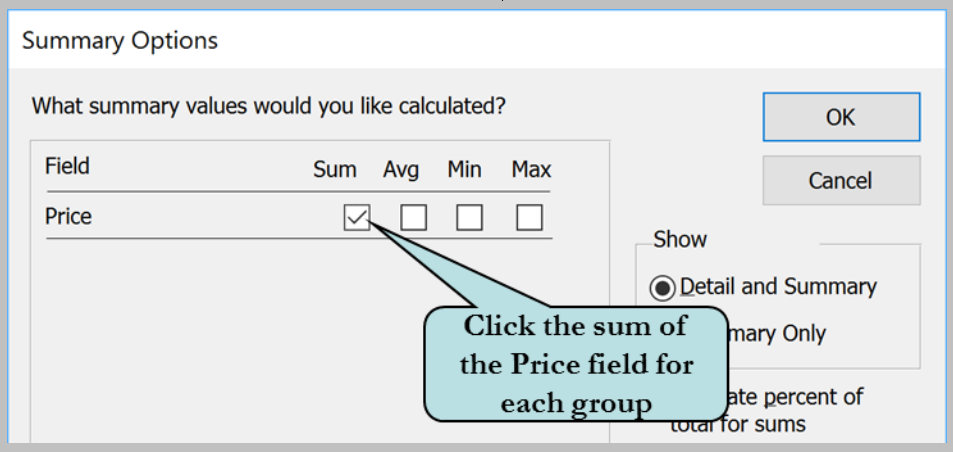
What	Why
6. Click **Next**.	Access automatically chose **Category** as the grouping level (the field in blue). This in fact is the field for which we want to add a grouping level.

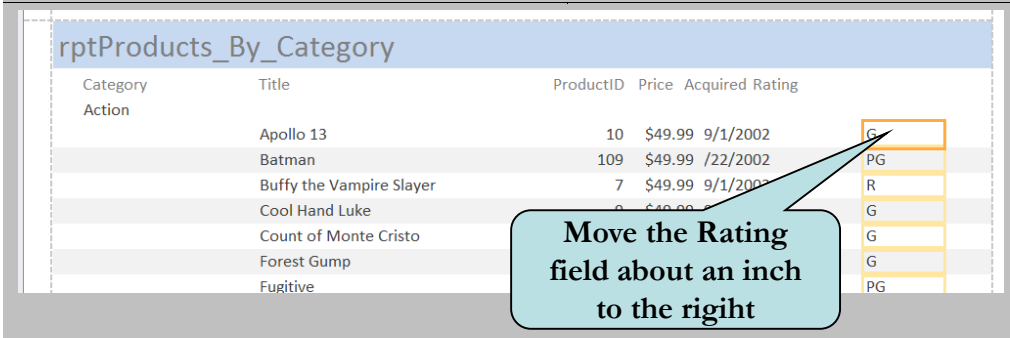


7. Select **Title** from the first blank combo box as shown below.	Select the first field by which we want to sort within the group.



8. Click the **Summary Options** button.	Displays the summary options box which allows us to add a calculation to our group.

What	Why
9. Click the **Sum** box for the **Price** field as shown below.	Selects the option to calculate the sum of the Price field for each group. The Sum Function is commonly used to subtotal a group of records.
	
10. Click **OK**.	Closes the Summary Options box and then returns to the Report Wizard.
11. Click **Next**.	Moves to the next step of the Wizard.
12. Click **Next**.	Accepts the default layout and page orientation and then moves to the next step of the Wizard.
13. Type: **rptProducts_By_Category** in the title text box.	Provides a name and title for our report.
14. Click **Finish**.	Completes the Wizard and then opens the report in Print Preview view.
15. Observe the report grouping.	Notice that each Category type is grouped together and the Price field for each group is totaled in the group footer. The grouped records are also sorted by title within each group.

What	Why
16. Observe the Price and Acquired fields.	Notice that some of the fields are not wide enough to accommodate the data. To fix this, you will need increase the length of the field in Report Design or in Report Layout view.
17. Click the **Close Print Preview** button.	Switches to Design View.
18. Click the **arrow** on the **View button** and then click **Layout View**.	Displays the report in Layout View.
19. Click on any of the values in the **Rating field**.	Selects the Rating field.
20. Move your cursor over the **right border** of the Rating field. Drag to the left until the field is about ½-inch long.	Decreases the size of the Rating field to about ½-inch.
21. Click inside any of the boxes of the Rating field and drag to the right about an inch as shown below.	Moves the Rating field about an inch to the right.
	
22. Click inside any of the boxes of the Acquired field and drag to the right about ½-inch.	Moves the Acquired field about ½-inch to the right.
23. Click on any of the values in the **Acquired field**.	Selects the Acquired field.

What	Why
24. Move your cursor over the **right border** of the Acquired field. Drag about ½-inch to the right.	Increases the width of the acquired field by about ½-inch.
25. Click on any of the values in the **Price field**.	Selects the Price field.
26. Move your cursor over the **right border** of the Price field. Drag about ½-inch to the right.	Increases the width of the price field by about ½-inch. All values are now displayed.
27. Now move and resize all of the labels so that they are lined up with the value boxes.	Repositions the labels so that they are lined up with the value boxes

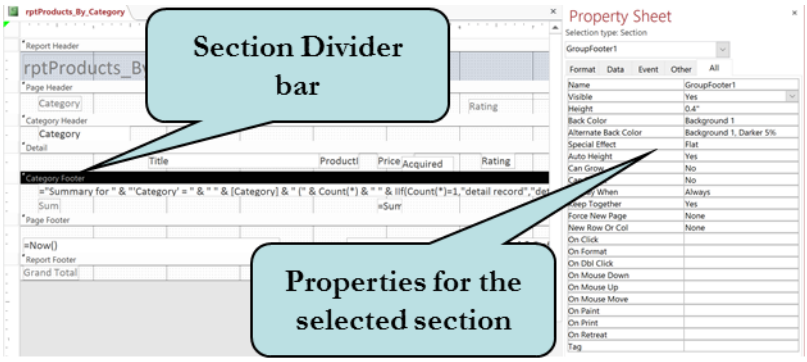
28. Click the **Save button** on the Quick Access Toolbar.	Saves our design changes.

5.8 Changing Report Section Properties

In this lesson, you will learn how to modify the properties of report sections.

Each section of a report has its own set of properties that you can modify. To display the properties for a **report section**, click the **Section Divider Bar** and then click the Property Sheet button. You can also **right-click** the section divider bar and then select Properties from the pop-up menu. Some of the common section properties that you can set are:

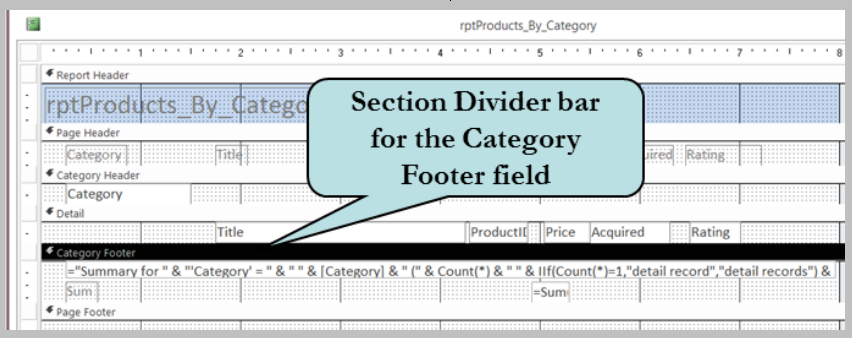
- **Force New Page** – allows you force a new page before or after the section each time the group changes.
- **Back Color** – Selects a color for the section
- **Keep Together** – allows you to keep the records for an entire group on one page if possible.
- **Visible** – Hides the section from view.
- **Can Grow** – Allows the section to grow larger to accommodate more data
- **Can Shrink** – Allows the section to grow smaller if all of the section space is not used.
- **Repeat Section** – Repeats the header for the section on each page.



To Modify Report Section Properties

1. Display the report whose section properties you wish to modify in **Design View**.
2. Click the **Section Divider Bar** of the section you wish to modify.
3. Click the **Properties Sheet button** on the Ribbon.
4. Make any desired section changes.

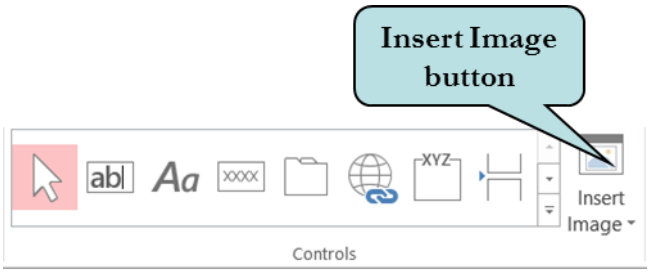
Let's Try It!

What	Why
1. Click the **Design** tab on the Ribbon.	Displays Design Options.
2. Click the **arrow** on the **View button** on the Ribbon and then click **Design View**.	Switches to Design view.
3. Click the **Section Divider Bar** for the **Category Footer** field as shown below.	Selects the Category Footer section.
	
4. Click the **Design** tab on the Ribbon.	Displays Design Options.
5. Click the **Property Sheet button** if the Property Sheet is not displayed.	Displays the properties for the Category Footer Section.
6. Click in the **Force New Page** box, click the arrow and then select **After Section** from the drop-down list.	Access will insert a new page after the section each time the Category changes.
7. Click the **Save** button.	Saves the design changes.
8. Click the **arrow** on the **View button** on the Ribbon and then click **Print Preview**.	Displays the report in **Print Preview** mode.
9. Click the **Next Page** navigation button.	Moves to the next page. Notice that a new page is inserted every time the Category changes.

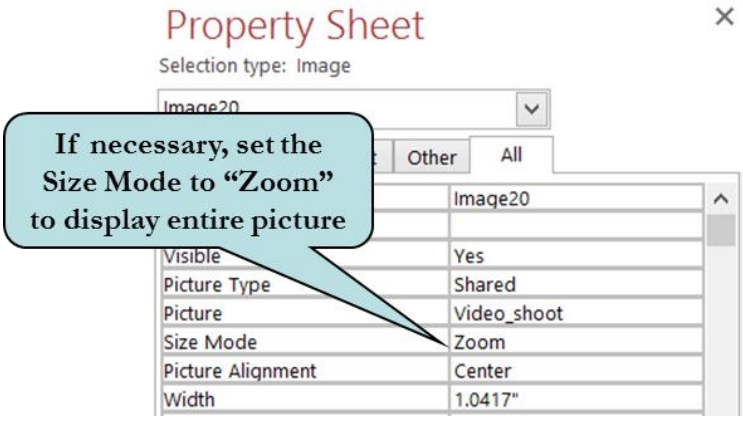
5.9 Inserting Graphics

In this lesson, you will learn how to insert graphics into your report.

Often, you will want to add a graphic file such as a company logo to your report. You can add a variety of different graphic file formats to your reports such as **.jpg, .gif, .bmp, .tif, and .wmf**. Adding graphics to a report works the same way as adding graphics to a form - click the **Insert Image button** on the Controls group on the Ribbon and click **Browse** to navigate to the folder where you image you want to insert is located. Next, select the image you want to insert and then click and drag where you want your image placed on your report.



Depending on the size of the image and the size of the image box that you drew on your form, some parts of your image may be cut off. If the object is larger than the control, the image may be clipped on the right and bottom by the control's borders. To remedy this problem, display the properties for the image object and then set the **size mode** to **Zoom**. This displays the entire graphic in the image object without distorting the proportions of the graphic. Most of the time, this should not be an issue as Access now by default, automatically sets the Size Mode to Zoom.



Tip: You can also insert a picture by clicking the **Logo** button on the Header/Footer group. The picture will automatically be inserted in the Report Header.

To Insert a Picture into a Report

1. Open the report into which you want to insert a graphic file.
2. Switch to **Design View**.
3. Click the **Insert Image** button on the Ribbon and click **Browse**.
4. Navigate to the folder that contains the image you wish to insert.
5. Select the graphic file and then click **OK**.
6. Click and drag on the form until the image box is the desired size.
7. If the image appears clipped:
   a. Select the image.
   b. Click the Property Sheet button.
   c. Click in the **Size Mode** property box.
   d. Select **Zoom** from the drop-down list.

Let's Try It!

What	Why
1. Click the **Close Print Preview button**.	Switches to Design view.
2. Click the Close button on the Property Sheet pane.	Closes the Property Sheet Pane.
3. Click the **Insert Image** button on the Controls group of the Ribbon and then click **Browse**.	Displays the Insert Image dialog box.
4. Click the drop-down arrow to the right of the **File Name** box and choose **All Files**.	Sets the option to display all files, not only Web-Ready images.
5. Click **Desktop** button on the left side of your screen.	Opens Desktop folder.
6. Double-click the **Lesson Files** folder in the right pane.	Opens the Lesson Files folder and displays the files in that folder.
7. Select the **video_shoot** file and then click **OK**.	Selects the file we wish to insert.

What	Why
8. In the Report Header, draw an image box about **1 inch high by 1 inch wide** to the right of the label (increase the height of the section, if necessary).	Sets the size of the image and then inserts the image.
9. Click the **arrow** on the **View button** and then click **Print Preview** button.	Switches to Print Preview view.

5.10 Applying a Theme to a Report

In this lesson, you will learn how to AutoFormat a Report.

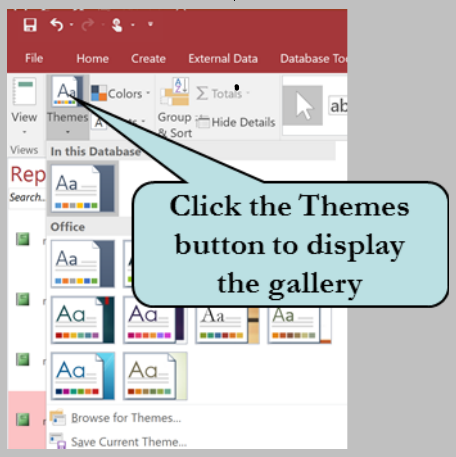
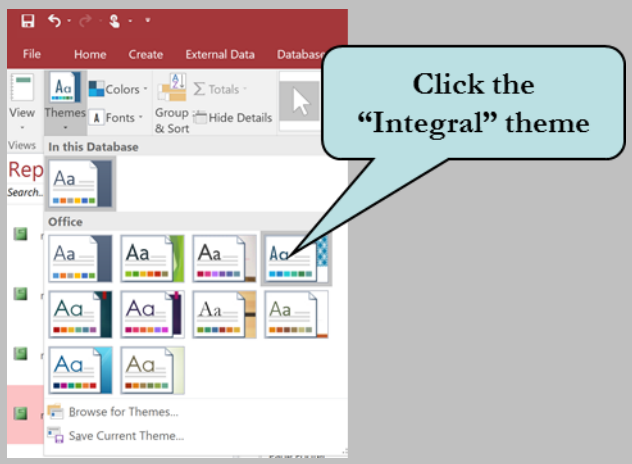
A quick way to apply formatting to your report is to apply preset formatting from a gallery of styles called **Themes**. The gallery of styles contains several themes that you can quickly apply to your report. Hold your mouse pointer over a style to view the style name.

The Themes icon is located on the contextual **Design tab**.

To Apply a Theme to a Report

1. Display the Report in Design View.
2. Click the **Design tab** on the Ribbon.
3. Click the **Themes** icon on the Themes group to display the Style Gallery.
4. Click the desired style from the Gallery.

Let's Try It!

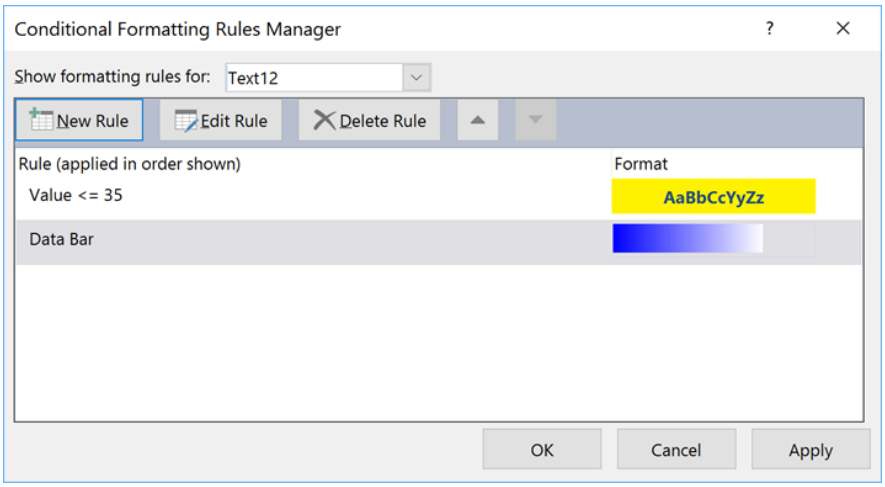
What	Why
1. Click the **Close Print Preview** button.	Returns to Design View.
2. If necessary, click the **Design** tab on the Ribbon.	Displays Design tools and commands.
3. Click the **Themes** icon on the Ribbon.	Displays the Themes Style Gallery.
	
4. Click the **Integral** theme in the 1st row 4th column as shown.	Applies the Integral style to the report.
	

What	Why
5. Click the arrow on the **View button** and click **Print Preview**.	Displays the report in Print Preview.
6. Click the report's **Close button**. Click **Yes** when prompted to save your changes.	Saves and closes the Report.

5.11 Applying Conditional Formatting

In this lesson, you will learn how to apply conditional formatting to a Report.

Conditional formatting allows you to apply formatting to selected values on a report based on a particular criteria. In other words, if the value of the field meets specific conditions you set, then the conditional formatting will be applied. Conditional formatting is a good way to visually call attention to specific values in your reports and help you see patterns in the data that you might not otherwise have noticed. For instance, if your product inventory falls below a certain level, you might add a green fill color, a yellow font color and bold formatting to cause the value to stand out from the others.



You can also compare the data in your field relative to other data in the same field by using **Data Bars**. Data Bars display a colored data bar relative to the value of the records in the field.

When applying conditional formatting, you need to choose the comparison rule you want to apply and then enter your criteria for the comparison. You can choose from the following comparison rules:

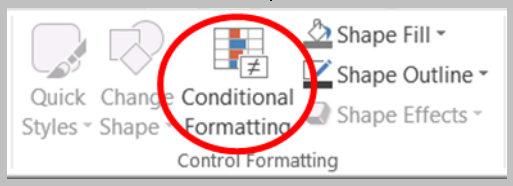
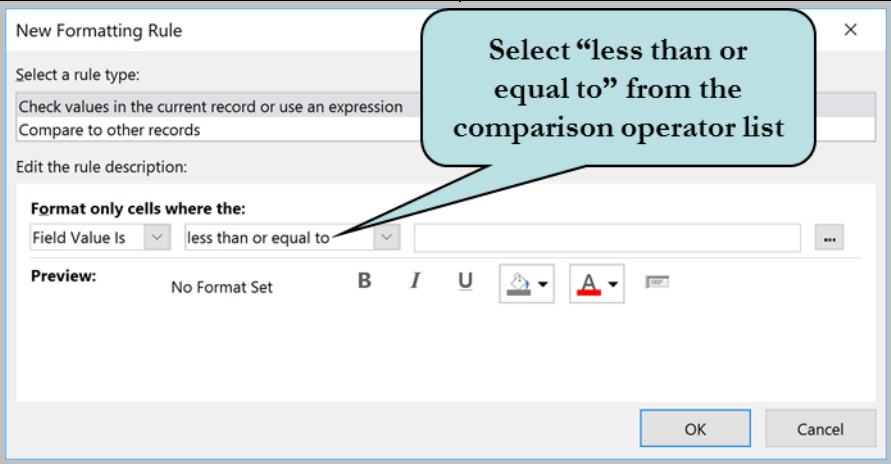
- Between
- Not Between
- Equal To
- Not Equal To
- Greater Than
- Less Than
- Greater Than or Equal To
- Less Than or Equal To

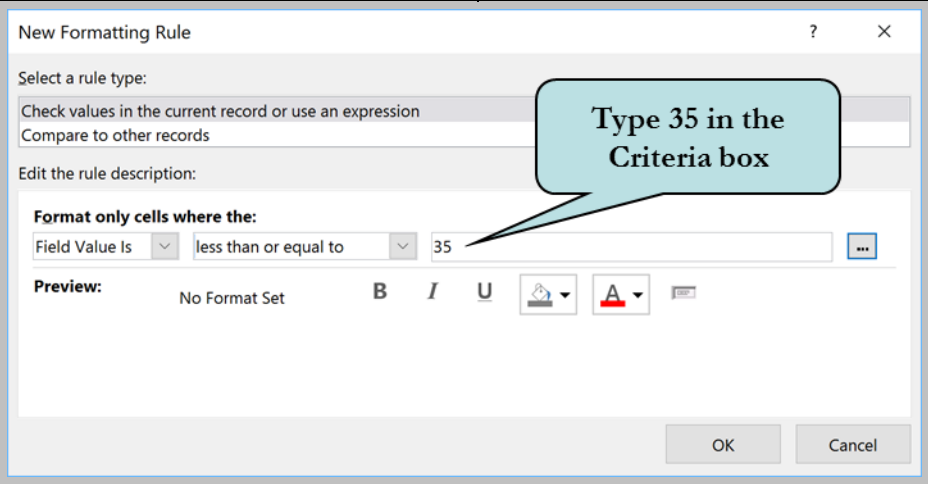
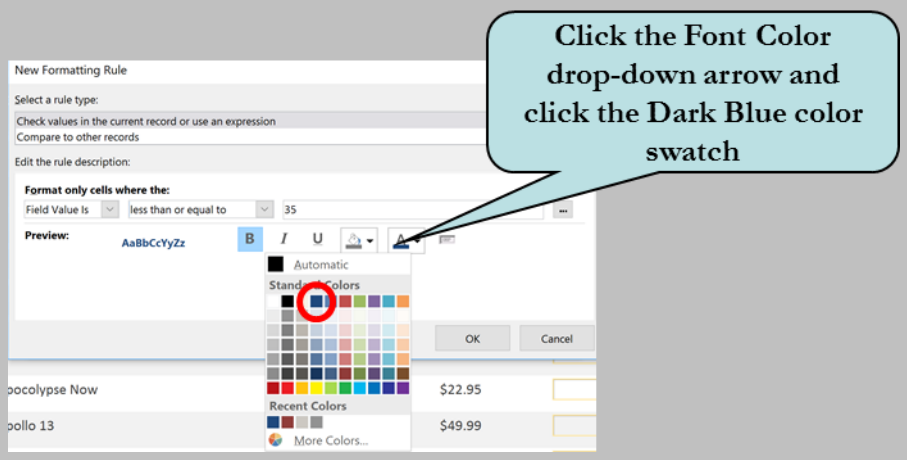
To Use Conditional Formatting

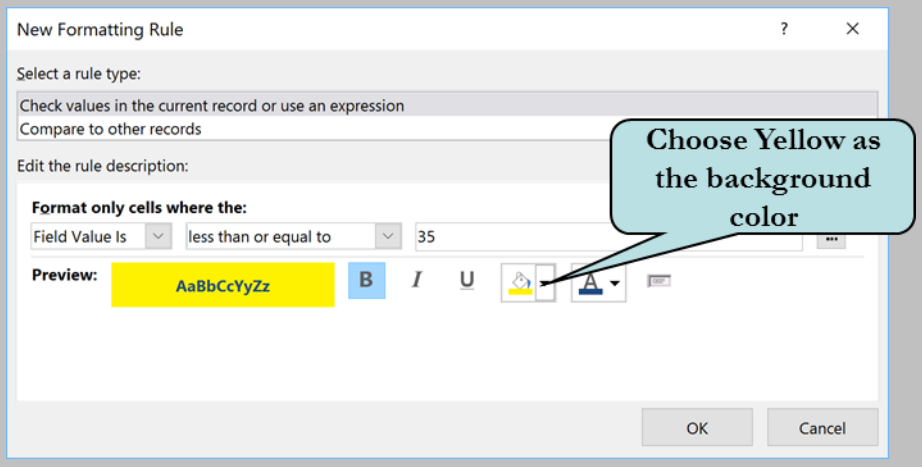
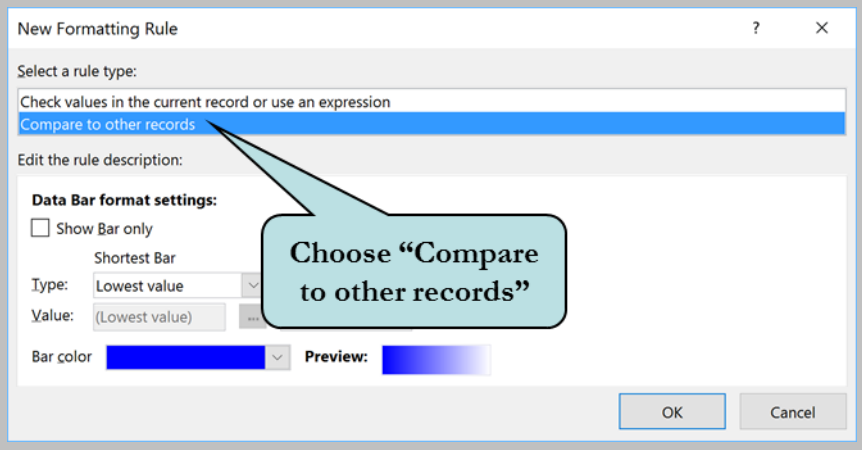
1. Open the report that you wish to format in Layout view or Design View.
2. Click the contextual **Format tab** on the Ribbon.
3. Click in the field you wish to format.
4. Click the **Conditional Formatting button** on the Ribbon.
5. To apply formatting to a different field (rather than the selected one), click the drop-down arrow to the right of the **Show formatting rules for:** box and choose the desired field.
6. Choose the desired rule type from the **Select a rule type:** drop-down list. To create a rule that is evaluated for each record individually, select **Check values in current records**. To create a rule that compares records to each other by using data bars, click **Compare to other records**.
7. Click the **New Rule** button to display the New Formatting Rule dialog box.
8. Click the comparison operator you want to apply to the selected field from the drop-down list.
9. Enter your criteria in the blank Criteria boxes.
10. Select the desired formatting to be applied when the condition evaluates as true from the **Preview** area.
11. Click **OK**.
12. To add an additional rule, click the New Rule box and follow the steps outlined above.
13. To change the priority of your rules, click the **Move Up** or **Move Down** buttons to reorder them.
14. To modify a rule, select the rule and then click the **Edit Rule** button.
15. To delete a rule, select the rule you want to remove and then click the **Delete Rule** button.
16. Click **Cancel** when finished.

Let's Try It!

What	Why
1. Right-click on the **rptNewPrices** report in the Navigation Pane and select **Layout View** from the menu.	Displays rptNewPrices in Layout View.
2. Click any of the values in the **New Price** field.	Selects the field to which we want to apply conditional formatting.
3. Click the contextual **Format** tab on the Ribbon.	Displays formatting tools and options.

What	Why
4. Click the **Conditional Formatting** button on the Control Formatting group as shown below.	Displays the Conditional Formatting Rules Manager dialog box.
	
5. Click the **New Rule** button.	Displays the New Formatting Rule dialog box.
6. Click the Comparison Operator drop-down list and choose **Less than or equal to** from the list as shown below	Sets the comparison operator to be less than or equal to.
	
7. In the empty **Criteria Box**, type in: **35** as shown below.	Enters in the criteria.

What	Why
	
8. In the **Preview: area**, click the **Bold** button (the "B" icon).	Applies bold formatting to any value matching our criteria.
9. Click the **Font Color** drop-down arrow and choose the Dark Blue color swatch (1st row, 4th column under the Standard Colors area as shown below.	Applies a dark blue font color to any value matching our criteria.
	
10. Click the **Background Color arrow** as shown below and click the **Yellow** color swatch.	Applies a yellow background color to any value matching our criteria.

What	Why
	
11. Click **OK**.	Saves the rule and displays the Conditional Formatting Rules Manager dialog box.
12. Click the **New Rule** button.	Displays the New Formatting Rule dialog box.
13. From the **Select a rule type** list, click **Compare to other records** as shown below.	This time, we are going to compare our values using Data Bars.
	

What	Why
14. Ensure that **Lowest value** in displayed in the Shortest Bar box and **Highest Value** is displayed in the Longest Bar box.	Sets the bar length according to the highest and lowest values. You can also choose number or percent from the type list.
15. Click **OK**.	Saves the rule and displays the Conditional Formatting Rules Manager dialog box.
16. Click **Apply**.	Applies our new rules to the report.
17. Click **Cancel**.	Closes the Conditional Formatting Rules Manager dialog box.
18. Click the **Design tab** on the Ribbon.	Switches to Design view.
19. Click the **View button arrow** and choose **Print Preview**.	Displays the report in Print Preview mode.
20. Click the Report's close button. Save any changes.	Saves and closes the report.
21. Click the **File tab** on the Ribbon and choose **Close**.	Closes the Rodneys Video 4 database.

Lesson Summary – Working with Reports

- In this lesson, you learned how to show or hide a Page Header, Page Footer, Report Footer and Report Header on report by clicking on any Section Bar and clicking Page Header/Footer or Report Header/Footer from the menu. You also learned about the various sections of a report in Design View.
- Then, you worked with report controls such as text boxes and labels. You learned how to add controls to reports from the Controls group on the Design Ribbon.
- Next, you learned that changing the properties of a control allows you to change the look of the control. You can change the font size, font style, font color, number of decimal places, caption, and alignment just to name a few via the Property Sheet Pane. To display the Property Sheet Pane, select the object and then click the Property Sheet button on the Tools group of the Design Ribbon. You can also double-click any object to display its Property Sheet or right-click on the object and then choose Properties from the pop-up menu. You also learned that you can change common formatting options from the Font group on the Formatting Ribbon.
- Next, you learned that you can perform calculations in reports by adding a Calculated control to your report - an unbound control (usually a text box) whose value is determined by an expression such as =[Subtotal] + [Tax]. To create a calculated control, type the expression directly into an unbound text box or enter the expression in the Control Source Property of the Property Sheet pane.
- Next, you learned how to change the data source of a control by modifying the Control Source Property of the control. Clicking on the arrow in the Control Source Property box displays all of the fields in the underlying query or table upon which the report or form is based. Selecting a data source from the list changes the control's data source.
- Next, you learned how to change the underlying table or query upon which the report is based. For instance, you may have initially created your report from a table but later decide you would rather base it upon a query to take advantage of the excellent filtering capabilities of queries. To change a report's data source, display the Property Sheet Pane for any control, click the Selection type drop-down arrow and select Report from the list. Then, then change the Record Source property.
- Next, you learned how to sort and group records when creating a report with the Report Wizard. Grouping records allows you to keep like records together, based on the values of one or more fields.

- Next, you learned that each section of a report has its own set of properties that you can modify. To display the properties for a report section, click the Section Divider Bar and then click the Property Sheet button.
- Next, you learned how to insert graphics into your report by using the Image Control on the Design Ribbon. Click the Insert Image button, select the image you want and then click and drag on the form until the image box is the desired size. You also learned that you can insert a picture by clicking the Logo button on the Header/Footer group. The picture will automatically be inserted in the Report Header.
- Next, you learned how to apply a preset style to a report by clicking the Themes button under the Design tab to display the Style Gallery and then clicking the desired style from the Gallery.
- Lastly, you learned how to apply conditional formatting to fields in your report, which allows you to apply formatting to selected records based on a particular criteria and helps call attention to specific values in your report. You learned that you can apply conditional formatting by clicking the Conditional Formatting button on the contextual Formatting Ribbon, specifying the criteria and then selecting the formatting to be applied to those records which meet the specified criteria.

Lesson 5 Quiz

1. In what report section would information that appears at the end of each group of records appear?

2. To show or hide the page header and footer, you:
   A. Click the Page Header/Footer button on the Controls group of the Design Ribbon.
   B. Right-click the form and choose Show Page Header/Footer from the menu.
   C. Click the View tab on the Ribbon and then click the Page Header/Footer button.
   D. Right-click any section bar and choose Page Header/Footer from the menu.

3. Report controls are found on the Report Controls group of the Arrange Ribbon.
   A. True
   B. False

4. On what group on the Ribbon can you find the Date and Time control?
   A. The Controls group on the Design Ribbon.
   B. The Date and Time group on the Arrange Ribbon.
   C. The Controls group on the Format Ribbon.
   D. The Header/Footer group on the Design Ribbon.

5. Describe the process of adding a calculated control to a report.

6. To display the properties for a control, you:
   A. Click the control to select it and then click the Control Properties button on the Controls group of the Design Ribbon.
   B. Click the control to select it and then click the Property Sheet button on the Tools group of the Design Ribbon.
   C. Click the control to select it and then click the Properties button on the Controls group of the Arrange Ribbon
   D. Click the control to select it and then click the Label box button on the Controls group of the Design Ribbon.

7. Double-clicking a control is one way to display the Themes gallery from where you can apply a preset format to a control.
   A. True
   B. False

8. What are the three main types of controls that you can add to your report?
   A. Labels, Text Boxes and Pictures.
   B. Bound Controls, Unbound Controls and Labels
   C. Calculated Controls, Bound Controls and Text Controls.
   D. Bound Controls, Unbound Controls and Calculated Controls.

9. To change the data source of a control you:
   A. Click in the Control Source Property Box in the Property Sheet pane and choose the new data source.
   B. Click in the Record Source Property Box in the Property Sheet pane and choose the new data source.
   C. Click the Control Source Property button on the Arrange Ribbon and select the new data source from the list.
   D. Right-click the control, point to Control Source and then choose the desired data source from the list.

10. To change the data source of a report from a table to a query, you would need to select the query from the _____ (fill in the blank) box in the Property Sheet pane.

11. What control allows you to insert an image in the Detail area of your form?
   A. The Insert Logo Control
   B. The Insert Image Control
   C. The Insert Picture Control
   D. The Insert Graphic Control

12. You want to apply a conditional formatting to your report. On what Ribbon tab can you find the Conditional Formatting button?
   A. Design tab
   B. Format tab
   C. Arrange tab
   D. Page Setup tab

LAB 5 – ON YOUR OWN

1. Open the **Lab5** database in the Lesson Files folder.

2. Create a new report using the **Report Wizard**. Use **qryCustomerOrders** as the Data Source. Add all of the fields to the report. Add grouping by the **State field (**Hint: double-click the State field when the wizard prompts you to add grouping levels). Sort by Last name and then by First name. Set the page orientation to Landscape. Name the report **rptCustomerOrders**.

3. Delete the label in the **Report Header Section**.

4. Add a **Label** to the State Header section with the caption **"State"** and place it to the left of the State text box control (you may have to reposition the State text box). When the error box appears, associate the label with the State text box.

5. Change the **Width** property of the **Quantity text box** to **.25.** Change the **Caption** property of the Quantity **label** to **Qty** and its width to **.25**. Change the Width property of the First Name and Last Name text boxes and labels to 1.

6. Move the First Name label & text box so that their left edge is at the 3-inch mark.

7. Select the following labels and text boxes: (hold down Shift key as you select): Product ID, Quantity, Price and Total. Drag to the left until the left edge of the Product ID controls is at the 4 ½-inch mark.

8. Increase the size of the Product ID label (drag to the left) so that all of the text is displayed.

9. Add a calculated control to the detail section that multiplies the **Total** field by 1.06 together (adds a 6% Handling Fee to the cost of each item). Delete the label that was added in the Detail section. Add a new label for the calculated control in the Page Header section with the caption **"Grand Total"**. Format both the new calculated field and the total field to currency, with 2 decimal places.

10. Display the properties for the **State Header Section**. Set the **Force New Page** property to **Before Section.**

11. Insert a label in the **Report Header Section** with the text: **Orders by State**. Change the font size of the label to 22. Increase the size of the label to accommodate all of the text.

12. Apply the **Slice theme** (3rd row, 1st column) to the report. Arrange any controls as necessary so that the labels and text boxes are lined up properly. Resize any labels so that all of the text is visible.

13. Change the **Fore Color** property of the **State** label in the State Header section to **red**. Apply bold and italics formatting to the label.

14. Add conditional formatting so that any value over $100 in the Grand Total field is displayed in red font, with bold and italics.

14. Save your design changes. Display the report in Print Preview mode.

15. When finished, close the report. Exit the database and close Access.

Class Project – Teddy Bears

You are the owner of Veronica's Teddy Bear store. Create a new database called "Teddy Bear"

Create a Products table and add at least 6 products into the table. Include such fields as Item description, cost, and Product ID. Set a validation rule on the cost field so that any value entered must be at least $15.00. The cost field should be formatted as Currency.

Create a Customers database and add at least 10 customers into the table. Include such fields as Customer ID, Name, Address, Phone. Make First Name and Last Name required fields.

Create an orders table. Include such fields as Order date, Date Shipped, Quantity, Customer ID, and ProductID. Set the data type of both the Customer and Product fields to number.

Establish the appropriate relationships between your tables. (Customer ID > Customer, Product ID > Product, etc.)

Create a lookup-field in your Orders table that looks up the Customer ID number from the Customer Table. Set the field to display the customer first and last name and to store the Customer ID field in the Customer field in the Orders table. Create another lookup field that looks up the Product ID field from the Products table. Set the field to display the Product name and store the Product ID field in the Product field in the Orders table. Enter at least 5 orders into your Orders table using a different customer for each order.

Create a multi-table query that displays a list of Customers and the Products they have ordered. Save the query with the name "qryOrders". Include the following fields: Last Name, First Name, Product description, Quantity and Price. Make sure that even if a customer has not placed an order that they will display when you run the query.

Create a Form and a Report based upon the qryOrders query. Include a calculated field both on the form and report that adds together the cost and the quantity. Name the new field "Total". Format the form and report so that they are as eye appealing as possible. Save the form as "frmProducts" and the report as "rptProducts".

Create a Main Form using your customers table that includes a subform based upon your Orders table. Rearrange and format the controls on your form to make it as appealing to the eye as possible. Save the form as "frmOrderEntry".

Create a query that includes all fields from your products table. Save the query with the name "qryProducts". Add a calculated field to add a $3.00 shipping charge to the cost of each product. Name the new field "ShipTotal"

Close the database.

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