

# 3

## Querying a Database



One of the main goals of a database is to organize data so that information can be located and retrieved quickly. People in all types of businesses retrieve stored data and information daily, often at a moment's notice. In this chapter, you will search information that is stored in tables in a relational database and extract records that meet specific criteria using a query, a database object used to locate records based on the conditions you set.

### LEARNING OBJECTIVES

- ▶ Create, save, and run select queries
- ▶ Create select queries using multiple tables
- ▶ Use simple query criteria
- ▶ Use AND and OR criteria in queries
- ▶ Use wildcard characters in query criteria
- ▶ Sort query results
- ▶ Create and format a calculated field

## Project: Using Queries to Get Answers

You have been asked to query the Winchester Web Design database and compile two separate customer lists. The lists will be used to notify all past clients of updates to their website contact forms. The first list will include only the first and last name of the clients and their email address. The second list will include the first and last name of the clients and their mailing addresses, sorted by ZIP code. Additionally, you have been asked to build queries that instantly calculate the total income from all the Winchester Web Design services, and from specific areas such as blogs or shopping carts.

## Select Queries

A select query allows you to select records from one or more database tables based on criteria that you set. A select query asks a question, such as, *What are the customer addresses?* or *How much money did the company make last month?* The answer to the question is a set of records. A select query is basically a database inquiry that selects only the records you want to see or edit. The easiest way to create a query is with the Query Wizard.

### Query Features

- ▶ A query functions like a saved question you ask a database.
- ▶ A query produces a subset of data from one or more tables.
- ▶ When you edit data in query results, you are actually editing the data stored in the source tables.
- ▶ Queries are dynamic objects that display up-to-date data from tables.
- ▶ Queries can be used to create forms and reports with fields drawn from multiple tables.

 Create→Queries→Query Wizard 

### DEVELOP YOUR SKILLS: A3-D1

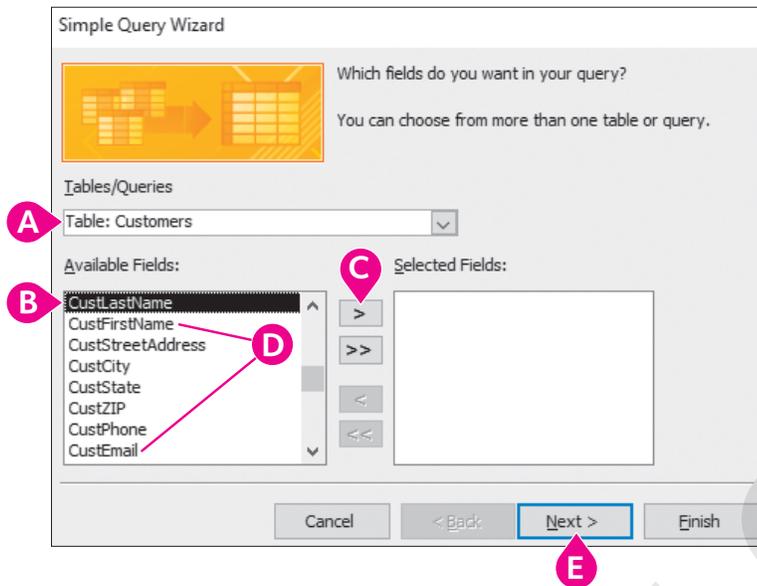
*In this exercise, you will use the Query Wizard to create a select query that generates a customer email list.*

1. Open **A3-D1-WinWebDesign** from your **Access Chapter 3** folder and save it as **A3-D1-WinWebDesignRevised**.

*When completing exercises, always choose to Enable Content. Notice in the Navigation pane that the database currently has three queries.*

2. Choose **Create→Queries→Query Wizard** .
3. Click **OK** to accept the Simple Query Wizard.

4. Follow these steps to build the query:



- A Make sure the **Customers** table is chosen in the Tables/Queries list. When building a query, you can use multiple tables and even existing queries.
- B Choose the **CustLastName** field from the Available Fields list.
- C Click the **Add >** button to add it to the Selected Fields list.
- D Now add the **CustFirstName** and **CustEmail** fields.
- E Click **Next**.

*If you add the wrong field by accident, double-click the name to move it back to the Available Fields list or select it and use the Move Back < and Move All Back << buttons.*

- 5. Type **Customers Email List** as the query title.
- 6. Make sure the **Open the Query to View Information** option is chosen and click the **Finish** button.

*Notice the query results datasheet includes only the three fields you chose from the Customers list.*

Last Name	First Name	Email
Abrams	John	JPAbrams@email.com
Anders	Mark	AndersM@email.com
Blaser	Helen	BlasingHel@email.com
Davis	Peter	DavisAngie@email.com

- 7. Click the **Close**  button to the right of the *Customers Email List* tab to close the query.

## Creating a Select Query Using Query Design View

Some queries display just a few fields but report on every single record in the table. That may not be a problem for a small table, but when thousands of records and multiple tables are involved, it is often necessary to choose only specific records by setting precise criteria. Using Query Design View, Access allows you to:

- ▶ Select fields from multiple tables
- ▶ Locate records using criteria from one or more fields
- ▶ Perform calculations
- ▶ Sort query results and show or hide fields in query results



View the video “Query Design View.”

Create → Queries → Query Design

### DEVELOP YOUR SKILLS: A3-D2

You have already created an email list for the Winchester Web Design customers and now need one for the company’s employees. In this exercise, you will create a query to select fields from the Employees table in the Winchester Web Design database and then rearrange the columns in the query grid.

1. Choose **Create** → **Queries** → **Query Design** to display the query design grid.  
*The Show Table list appears, showing tables and existing queries in the database.*
2. Choose the **Employees** table and click the **Add** button.  
*The Employees table appears in the design grid.*
3. Close the Show Table box and close the Property Sheet box if it is open.  
*Next you will add fields from the Employees table to the grid.*
4. Double-click the **EmpFirstName** field in the **Employees** table to add it to the grid.
5. Now add the **EmpLastName**, **EmpPhone**, and **EmpEmail** fields to the grid by either double-clicking or dragging them.

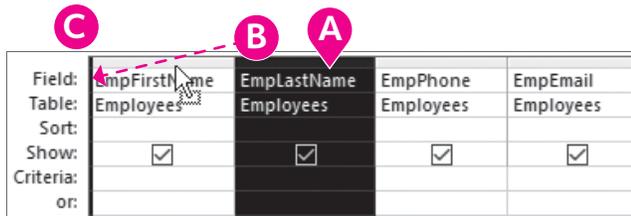
Field:	EmpFirstName	EmpLastName	EmpPhone	EmpEmail
Table:	Employees	Employees	Employees	Employees
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				
or:				

6. Choose **File** → **Save** or click the **Save** button on the Quick Access toolbar.
7. Type **Employee Contact Info** as the query name and click **OK**.
8. Click the **Run** button.

*Access runs the query and displays four columns of data (First Name, Last Name, Telephone, and Email) for all Employee records.*

## Rearrange Query Fields

- Choose **Home**→**Views**→**Design View**  to switch to Design View.
- Follow these steps to rearrange the EmpFirstName and EmpLastName fields:



Field:	EmpFirstName	EmpLastName	EmpPhone	EmpEmail
Table:	Employees	Employees	Employees	Employees
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				
or:				

- Click the **EmpLastName** column heading to select the column. The mouse pointer will change to a white arrow, indicating you can now move the column.
  - Drag the **EmpLastName** column to the left of the EmpFirstName column until the thick vertical bar is positioned as shown here.
  - Release the mouse button to complete the rearrangement.
- Run  the query.  
*Last Name should now appear first in the results.*
  - Close the query and save the changes.

## Designing a Query Using Multiple Tables

Until now, the datasheets you have worked with have displayed data from only one table. There will be times when you need to view data contained in different tables within the same database. Queries allow you to do this.

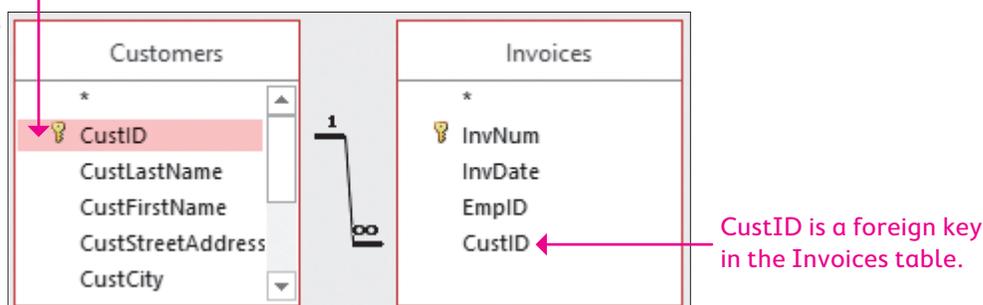
### Choosing Fields to Include in a Query

When you build a query, you select only those tables and fields that you want to display in the query results datasheet and leave out those fields that have no impact on the data you want to view or that are confidential. By specifying only certain tables and fields in a database and displaying only the desired fields in a query, you can create a report or a form that only presents pertinent data.

### Selecting a Field That Appears in Multiple Tables

Multiple tables are only effective in a query if the tables are related. Sometimes the same ID field occurs as a **primary key** in one table and as a **foreign (or secondary) key** in another table. If this occurs, always use the table with the primary key in your query.

Use the **Customers** table in the query because **CustID** is the primary key.



### DEVELOP YOUR SKILLS: A3-D3

In this exercise, you will create a multitable query to track the Winchester Web Design invoices by invoice number using Query Design view.

1. Choose **Create**→**Queries**→**Query Design**  to display the query design grid.
2. Double-click the **Invoices**, **Invoice Details**, and **Products** tables to add them to the query.  
*If the Show Table dialog box is not visible, choose Design→Query Setup→Show Table.*
3. Close the Show Table box.
4. Double-click the **InvNum**, **InvDate**, and **EmpID** fields in the Invoices table to add those fields to the query grid.
5. Add the **ProdDescription** and **Price** fields from the **Products** table.
6. Add the **Qty** field from the **Invoice Details** table.

Your query field list should look like this.

Field:	InvNum	InvDate	EmpID	ProdDescription	Price	Qty
Table:	Invoices	Invoices	Invoices	Products	Products	Invoice Details
Sort:						
Show:	<input checked="" type="checkbox"/>					
Criteria:						
or:						

7. Click the **Sort** box for the InvNum field, click the menu button ▼, and choose **Ascending**.

Field:	InvNum	InvDate
Table:	Invoices	Invoices
Sort:	Ascending	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		
or:		

8. Save the database and save the query as **InvoicesList** and click **OK**.
9. Choose **Design**→**Results**→**Run**  to run the query.

The query results will now be sorted by Invoice Number in the first column.

## Using Criteria in Queries

Queries let you specify criteria, which are conditions that field values must meet. Only records meeting the criteria are returned when the query is run.

Field:	InvNum	InvDate	EmpID	ProdDescription	Price	Qty
Table:	Invoices	Invoices	Invoices	Products	Products	Invoice Details
Sort:	Ascending					
Show:	<input checked="" type="checkbox"/>					
Criteria:			"JFW"			
or:						

In this query, the EmpID criteria is set to JFW.

InvNum	Invoice Date	Emp ID	Description	Price	Qty
1	3 /15/2012	JFW	Secondary Page	\$200.00	6
1	3 /15/2012	JFW	Image, Custom Designed	\$40.00	11
1	3 /15/2012	JFW	Home Page, Nav, CSS, Design	\$400.00	1
5	6 /19/2012	JFW	Image, Custom Designed	\$40.00	9

Only records where EmpID is **JFW** are returned.

Criteria are commonly used with text, numeric, currency, and date fields. The following table provides a few examples of how criteria are used.

TYPES OF CRITERIA		
Field Type	Criteria	Examples of How Records Are Returned
Text	Smith	Last name is Smith
	> =Smith	Last names are from Smith through the end of the alphabet
	Not Smith	Last name is not Smith
Numeric & Currency	> 123	Numeric value is greater than 123
	> =123	Numeric value is greater than or equal to 123
Date	Date( )	Date is today's date
	< Date( ) – 30	The Date field is 30 days or more prior to today's date

**Tip!** Search for Query Criteria in Access help for more criteria examples.

### DEVELOP YOUR SKILLS: A3-D4

In this exercise, you will add criteria to the query grid and run the query.

1. If necessary, open the **InvoicesList** query and switch to **Design View**.
2. Click the **Criteria** box for the EmpID field, type **JFW**, and tap **Enter**.  
Access will apply quotation marks indicating this is a literal value.

Field:	InvNum	InvDate	EmpID
Table:	Invoices	Invoices	Invoices
Sort:	Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			"JFW"
or:			

3. Choose **Design**→**Results**→**Run** to run the query.  
The query results now only include records where the EmpID is equal to JFW.
4. Close the query and choose **No** when prompted to save the changes.  
Saving changes to the query at this time would save the JFW criteria as part of the query. However, you will continue to use the query for all employees.

## Wildcard Characters

**Wildcard characters** are used to locate records that have similar but not identical data. They help you locate records that match a pattern. For example, you might want to find all customers with last names that begin with the letter *B* or all products that begin with the word *Blog*.

WILDCARD CHARACTERS	
Common Wildcard Symbols	How They Are Used
Asterisk (*)	Substitutes for a group of characters that appear at the position of the asterisk <b>Example:</b> <i>R*</i> in the last name field will locate all last names beginning with <i>R</i> regardless of how many characters make up the name. In this case, <i>Rogers</i> , <i>Rich</i> , and <i>Rodriquez</i> would all appear in the results datasheet.
Question mark (?)	Substitutes for a single character that might appear at the position of the question mark <b>Example:</b> <i>m?s</i> will locate records containing values such as <i>mrs</i> , <i>ms</i> , and <i>mbs</i> .
Open/close brackets [ ]	Matches text or individual characters placed within the brackets individually <b>Example:</b> <i>ca[rt]</i> will find <i>cat</i> and <i>car</i> but not <i>cab</i> or <i>cad</i> .

**Tip!** Search for Wildcard Characters in Access help for more wildcard symbols and examples.

## AND and OR Criteria

In some cases, you may need to locate records that meet multiple criteria. This can be done using AND and OR conditions. For example, you may want to locate all records where the employee is web certified AND lives in Sarasota. Or you may want to locate all employees who live in Sarasota OR Bradenton.

Field:	CustID	CustFirstName	CustLastName	CustCity
Table:	Customers	Customers	Customers	Customers
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				"Sarasota" "Bradenton"
				or:

Create an OR condition by adding a second criterion to the Or row of a field.

Field:	InvNum	InvDate	ProdDescription	Price	Qty
Table:	Invoices	Invoices	Products	Products	Invoice Details
Sort:	Ascending				
Show:	<input checked="" type="checkbox"/>				
Criteria:			"Image"		> 10

Create an AND condition by adding another criterion to a different field on the Criteria row.

## DEVELOP YOUR SKILLS: A3-D5

In this exercise, you will use wildcards to locate variable data and set multiple criteria in a query to find out which customers have gotten blogs and which customers have added more than ten images at a time to their websites.

1. Open the **Invoices Query** query in **Design View**.
2. Follow these steps to use wildcard characters and to use AND and OR criteria:

Field:	InvNum	InvDate	ProdDescription	Price	Qty	LineTotal: [Qty]*[Price]
Table:	Invoices	Invoices	Products	Products	Invoice Details	
Sort:						
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			Like "Blog*"			
or:			Like "Image*"	>10		

- A Click in the **ProdDescription Criteria** box, type **Blog\***, and tap **Enter**.  
Access converts Blog\* to Like "Blog\*".
- B Click in the ProdDescription **Or** box, type **Image\***, and tap **Enter**.
- C Click in the Qty **Or** box and type **> 10**. Be sure to type in the same row as *Like "Image\*"* (the Or row).

These criteria will choose records where ProdDescription begins with Blog OR ProdDescription begins with Image AND the Qty is greater than 10.

3. Run  the query.  
Access displays the records that meet the specified criteria: either a blog or a transaction with more than ten images.
4. Close the query and save the changes.

## Date Criteria

You can set date criteria to determine age, hired date, invoice date, and so forth. Access acknowledges the same comparison criteria for performing date comparisons that it does for locating other types of data, regardless of the format used to enter dates.

### DATE CRITERIA

Criterion	Examples of How Records Are Returned
06/22/2013	Date is 06/22/2013
<22-Oct-2013	Dates that occur before 22/Oct/2013
>01/01/13	Dates that occur after 01/01/13
Between 01/01/13 and 06/30/13	Dates between 01/01/2013 and 06/30/2013

**DEVELOP YOUR SKILLS: A3-D6**

Winchester Web Design needs to track all invoices issued in 2012. In this exercise, you will query the database to locate customers with invoices dated from January 1, 2012, through December 31, 2012.

1. Choose **Create**→**Queries**→**Query Design** .
2. Use double clicks to add the **Customers, Invoices, Invoice Details,** and **Products** tables to the query.
3. Close the Show Table box.
4. Double-click **InvNum** and **InvDate** in the **Invoices** table to add those fields to the query grid.
5. Add the **CustID** field from the **Customers** table.
6. Add the **Qty** field from the **Invoice Details** table.
7. Add the **ProdDescription** and **Price** fields from the **Products** table.
8. Widen the InvDate field by dragging the column heading to the right as shown here.

You will enter a long entry in the next step, and widening the InvDate column will allow you to see the entire entry.

InvDate	CustID
Invoices	Customers
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

9. Click in the **Criteria** box for the InvDate field, type **Between January 1, 2012 and December 31, 2012**, and then tap **[Enter]**.

Access will format the expression, and your query grid should now match the following example. Regardless of how you type the dates, whether January 1, 2012; 01/01/12; or 1-1-2012, Access formats the date after you enter it so that it appears as #1/1/2012#.

Field:	InvNum	InvDate	CustID	Qty	ProdDescription	Price
Table:	Invoices	Invoices	Customers	Invoice Details	Products	Products
Sort:						
Show:	<input checked="" type="checkbox"/>					
Criteria:		Between #1/1/2012# And #12/31/2012#				
or:						

10. **Run**  the query.  
Notice that only records with a date in 2012 appear in the results.
11. Choose **File**→**Save** or click the **Save** button on the Quick Access toolbar.
12. Save the query as **Invoices2012** and then close it.

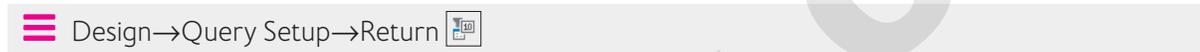
# Sorting, Showing, and Limiting Results

The query grid contains a Sort row that lets you **sort** the query results. At times you may also want to use fields to specify criteria but may not want those fields to be displayed in the query results. This can be accomplished by unchecking the Show box for the desired field(s).

## Limiting the Number of Results Displayed

Large databases with millions of records often return so many records that it can be challenging to find what you are looking for. So limiting the number of records displayed can be beneficial, especially when these records are sorted.

For example, if you set up a query to sort in descending order and then limit the number of items displayed to ten, you would, in effect, have a list of the top ten items in the table being queried. The Return feature lets you set the number of records to be displayed, or returned, in the query results.



### DEVELOP YOUR SKILLS: A3-D7

In this exercise, you will create a query that sets a sort order and you will hide a field from displaying in the query results. You will also limit the number of records returned.

1. Choose **Create**→**Queries**→**Query Design**
2. Use double clicks to add the **Customers**, **Invoices**, **Invoice Details**, and **Products** tables to the query.
3. Close the Show Table box.
4. Double-click the **CustID**, **CustFirstName**, and **CustLastName** fields in the **Customers** table to add them to the design grid.
5. Add the **InvDate** field from the **Invoices** table.
6. Add the **ProdDescription** field from the **Products** table.
7. Add the **Qty** field from the **Invoice Details** table.
8. Follow these steps to set a criterion and set the sort order:

Field:	CustID	CustFirstName	CustLastName	InvDate	ProdDescription	Qty
Table:	Customers	Customers	Customers	Invoices	Products	Invoice Detail
Sort:						Descending
Show:	<input checked="" type="checkbox"/>					
Criteria:					Like "Image"	
or:						

- A** Click in the **ProdDescription** criteria box, type **Image\***, and tap **Enter**. Access converts *Image\** to *Like "Image"*. This criterion will choose only records where the product description begins with *Image*.
- B** Click in the **Sort** box for the Qty field and choose **Descending** from the list of sort options.

9. Run  the query.

*Notice the records are sorted in descending order (largest to smallest) by quantity.*

*CustID is an important key to have in the query because it is a primary key field. But it isn't needed in the query results because it contains the same information that appears in the CustFirstName and CustLastName fields. So you will hide it from the query results.*

10. Choose **Home**→**Views**→**Design View**  to switch back to Design View.

11. Uncheck the **Show** box for the **CustID** field and Run  the query.

*The CustID field is still part of the query design, but it no longer shows in the query results.*

12. Switch back to **Design View** and choose **Design**→**Query Setup**→**Return**  menu button .

13. Choose **5** from the list and run the query.

*The query returns seven records (not five). This is because the query returns all records with the five largest quantities. But three records had a Qty of 14, which is the fifth highest amount, so all of those records were returned, increasing the total to seven records.*

14. Save the query as **Most Images** and then close it.

## Calculated Fields

Calculated fields are formulas that perform calculations on other query fields. Calculated fields are added to queries and are not part of the underlying query tables. They are added to the query design grid and their calculated results then appear in the query results. A calculated field:

- ▶ Creates a new field in a query that can also be used in a form or report
- ▶ Can be used to perform mathematical operations such as addition and multiplication
- ▶ Has a name and can be formatted with properties just like a regular field
- ▶ Enables you to combine values in two text fields into one field such as LastName and FirstInitial
- ▶ Updates and recalculates each time you run the query

### Identifying Parts of a Calculated Field

The structure of a calculated field includes a field name and a mathematical expression. Two examples of calculated fields in an Access query would be Wage: Hours \* Rate and Total: Price \* Quantity, where Wage and Price are calculated field names and Hours \* Rate and Price \* Quantity are the calculations that are performed.

Price	Qty	LineTotal: [Price]*[Qty]
Products	Invoice Details	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The LineTotal calculated field multiplies Price \* Qty

Price ▾	Qty ▾	LineTotal ▾
\$200.00	6	\$1,200.00
\$40.00	11	\$440.00
\$400.00	1	\$400.00
\$40.00	15	\$600.00

The query results

Each calculated field can contain the following elements.

CALCULATED FIELD ELEMENTS	
Element	Description
Calculated field name	This is the unique name you assign to the field and is followed by a colon (:) to separate the field name from the expression.
Field names from existing tables	Field names from the query can be added to the calculated field expression. Access adds brackets [ ] around field names.
Arithmetic or comparison operators	Use +, -, *, /, (), ^, <, =, > to perform mathematical operations or compare values.
Concatenation (i.e., linking together)	An ampersand (&) can be used to join text values from multiple fields. For example, FirstName&LastName.  Spaces can be added between fields by using quotation marks around a single space (" "). For example, the quotation marks in FirstName & " " & LastName create a space between the first and last names in the query results.

### Calculated Field Properties

You can set field properties such as size, number format, and default values within tables. Likewise, you can set field properties in calculated fields. This is almost always needed in calculated fields as the query results need to be formatted with the correct number of decimal places, commas, currency format, and other formatting as needed. Field properties are set using the field Property Sheet.

☰ Design → Show/Hide → Property Sheet 

### DEVELOP YOUR SKILLS: A3-D8

In this exercise, you will create and format a calculated field.

1. Open the **InvoicesList** query and switch to **Design View**.
2. Click in the **first cell** of the blank column next to the Qty field.

Price	Qty	
Products	Invoice Details	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	>10	

3. Type the calculated field expression **LineTotal:Price \* Qty**, making sure you include the colon between *LineTotal* and *Price*.
4. Tap **Enter**.

Access will format your expression by adding brackets to field names.

The name of your calculated field is *LineTotal*, and it will multiply the *Price* times the *Qty* in each record when the query is run. Your completed field should match the following.

Field:	InvNum	InvDate	EmpID	ProdDescription	Price	Qty	LineTotal: [Price]*[Qty]
Table:	Invoices	Invoices	Invoices	Products	Products	Invoice Details	
Sort:	Ascending						
Show:	<input checked="" type="checkbox"/>						
Criteria:							
or:							

5. Right-click anywhere in your calculated field column and choose **Properties**.
6. Set the Format property to **Currency** and type **Line Total** in the **Caption** field.  
*The currency format will display the calculated results with a dollar sign and two decimals. The caption will become the column heading for your calculated field in the query results.*
7. Run  the query, and your calculated field results will appear as shown below.

InvNum	Invoice Date	Emp ID	Description	Price	Qty	Line Total
	3 /15/2012	JFW	Secondary Page	\$200.00	6	\$1,200.00
1	3 /15/2012	JFW	Image, Custom Designed	\$40.00	11	\$440.00
1	3 /15/2012	JFW	Home Page, Nav, CSS, Design	\$400.00	1	\$400.00
2	4 /2 /2012	MJW	Image, Custom Designed	\$40.00	15	\$600.00
2	4 /2 /2012	MJW	Home Page, Nav, CSS, Design	\$400.00	1	\$400.00
2	4 /2 /2012	MJW	Secondary Page	\$200.00	7	\$1,400.00

8. Save and close the query and then close the A3-D1-WinWebDesignRevised database.

## Self-Assessment



Check your knowledge of this chapter's key concepts and skills using the Self-Assessment in your ebook or eLab course.

# Reinforce Your Skills

## REINFORCE YOUR SKILLS: A3-R1

### Create Queries Using Criteria and Wildcards

*Kids for Change is planning to fine-tune their database by adding queries that enable them to track activities as well as staff/volunteer availability. In this exercise, you will create various queries that will yield the desired information.*

1. Open the **A3-R1-K4C** database from your **Access Chapter 3** folder and save it as **A3-R1-K4CRevised**.

### Create a Query Using the Query Wizard

2. Choose **Create**→**Queries**→**Query Wizard** .
3. Choose **Simple Query Wizard** and click **OK**.
4. Choose the **Activities** table and add the **Activity**, **Location**, **Day**, and **MeetTime** fields to the **Selected Fields** list.
5. Click **Next**, name the query **Activities List**, and finish the query.
6. Review the query results and then close the query.

### Create a Query in Design View

7. Choose **Create**→**Queries**→**Query Design**  to start a new query.
8. Add the **Volunteers** table and then close the Show Table box.
9. Use double clicks or drag and drop to add the **VolLastName**, **VolFirstName**, **VolPhone**, and **VolDay** fields to the query design grid (in that order).
10. Run the query and take a moment to review the results.

*Now you will change the field order.*

11. Switch to **Design View** .
12. Click the **VolDay** field heading to select the field.
13. Drag the **VolDay** field, dropping it in front of the *VolLastName* field.

Field:	VolDay	VolLastName	VolFirstName	VolPhone
Table:	Volunteers	Volunteers	Volunteers	Volunteers
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				
or:				

14. Run  the query and review the results.
15. Save the query as **Volunteer List** and then close it.

### Create a Multi-Table Query

16. Create a new query in **Query Design** view and add the **Activities** and **Staff** tables to the query.
17. Add the **Activity**, **Day**, and **MeetTime** fields from the **Activities** table to the query design grid.
18. Add the **StaffLastName**, **StaffFirstName**, and **StaffPhone** fields from the **Staff** table.
19. Set the **Sort** option for the Activity field to **Ascending**.

- 20. Run  the query and view the results.
- 21. Save the query as **Activity Staffing List** and then close it.

### Add Wildcard and AND/OR Criteria to a Query

- 22. Right-click the **Activity Staffing List** query in the Navigation pane and choose **Design View**.

*You can open a query in Design View using this method or you can run it first and then switch to Design View. Remember to try right-clicks if you are having trouble finding commands.*

- 23. Create a Saturday or Sunday OR condition in the Day field as shown here.

*Typing the quotation marks " " isn't necessary, as Access will add them for you.*

Field:	Activity	Day	MeetTime
Table:	Activities	Activities	Activities
Sort:	Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		"Saturday"	
or:		"Sunday"	

- 24. Run the query.  
*Only activities for Saturday or Sunday should be displayed.*
- 25. Switch to **Design View**.
- 26. Remove the "Sunday" OR condition by deleting it.
- 27. Now enter **12:00** in the MeetTime **Criteria** field as shown here, tapping  when finished.

*This creates a Saturday AND 12:00 meet-time condition. Access will format the 12:00 condition like this: #12:00:00 PM#.*

Field:	Activity	Day	MeetTime
Table:	Activities	Activities	Activities
Sort:	Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		"Saturday"	#12:00:00 PM#
or:			

- 28. Run the query.  
*Just one activity meeting, the AND condition (a car wash), should be returned by the query.*
  - 29. Switch to **Design View** and remove both the Saturday and 12:00 criteria.
  - 30. Type **S\*** in the **Criteria** box for the Day field and tap .
- Access recognizes the asterisk \* wildcard character and formats the condition as Like "S\*". This should return all records where the name of the day begins with S (Saturday and Sunday). This should produce the same results as when you used the Saturday OR Sunday condition earlier in this exercise.*
- 31. Run the query and take a moment to observe the results.
  - 32. Save the changes and close the query.

### Add Date Criteria to a New Query

*Now you will create a query that returns the records of the youngest children so you can determine which children may need more supervision.*

- 33. Create a new query in **Design View** and add only the **Children** table to the query.
- 34. Add the **ChildLastName**, **ChildFirstName**, and **BirthDate** fields to the query.

35. Run the query and take a moment to observe the results.  
*Now you will add a condition.*
36. Switch to **Design View**, type **>January 1, 2005** in the BirthDate **Criteria** field, and tap **Enter** when finished.  
*Once again Access will apply formatting to the criterion.*
37. Run the query.  
*Only records where the child was born after January 1, 2005, should be displayed.*
38. Choose **File**→**Save** or click the **Save** button on the Quick Access toolbar and save the query with the name **Younger Children**.
39. Close the query and then close the **A3-R1-K4CRevised** database.

## REINFORCE YOUR SKILLS: A3-R2

### Limit the Records Returned and Use Calculated Fields

*Kids for Change is planning to fine-tune their database by adding queries that will produce calculated results. You are in charge of their IT department, and it is your responsibility to generate the desired query results.*

1. Open the **A3-R2-K4C** database from your **Access Chapter 3** folder and save it as **A3-R2-K4CRevised**.

### Limit and Sort Query Results

2. Run the **Children List** query.  
*The query returns the records of all children in the database in alphabetical order by last name.*
3. Switch to **Design View** and choose **Design**→**Query Setup**→**Return**  **menu button** ▼.
4. Choose **5** from the list.
5. Click in the **Sort** box for the BirthDate field and choose **Descending**.
6. Run the query.  
*Only the records for the five youngest children should be displayed.*
7. Close the query, saving the changes.

### Add a Calculated Field and Format the Field

*As part of their community give-back policy, Kids for Change puts 10 percent of all donations into a scholarship fund. Now you will add a field that calculates 10 percent of each donation.*

8. Run the **Donations Query** query and take a moment to observe the results.
9. Switch to **Design View** and scroll to the right in the query grid until the first empty column is visible.  
*You will enter a calculated field in this column.*
10. Type **ScholarFund:Amount\*.1** in the first cell (the Field cell) of the empty column, being sure to include the colon between *ScholarFund* and *Amount*.
11. Tap **Enter** to complete the calculated field, and if necessary, widen the column so you can see the entire calculated field.

12. Right-click anywhere in your calculated field column and choose **Properties** to display the Property Sheet for the field.
13. Click in the **Format** box and choose **Currency** from the drop-down list.
14. Type **Scholar Fund** in the **Caption** box.
15. Run the query and take a moment to ensure that the calculated field is calculating correctly and is formatted with the Currency format.
16. Close the query, saving the changes.
17. Close the database.

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## REINFORCE YOUR SKILLS: A3-R3

### Create Select Queries Using Criteria and Calculated Fields

*Kids for Change is planning to fine-tune their database by adding queries that will produce calculated and formatted results based on specific search criteria.*

1. Open the **A3-R3-K4C** database from your **Access Chapter 3** folder and save it as **A3-R3-K4CRevised**.

### Create a Query Using the Query Wizard

2. Use the **Query Wizard** to create a simple query and choose the **Donors** table.
3. Add the **DonorLName**, **DonorFName**, **DonorPhone**, and **DonorEmail** fields to the query.
4. Use **Donor Contact List** as the query name and finish the query.
5. Review the query results and close the query.

### Create a Query in Design View

6. Create a new query using **Query Design** view and add the **Staff** table to the query.
7. Add the **StaffLastName**, **StaffFirstName**, **StaffStreet**, **StaffCity**, **StaffST**, and **StaffZIP** fields.
8. Save the query as **Staff Mailing List**, Run the query, and review the results.
9. Close the query.

### Create a Multi-Table Query

10. Create a new query using **Query Design** view and add the **Activities** and **Children** tables to the design grid.
11. Add the **Activity**, **Day**, and **MeetTime** fields from the **Activities** table.
12. Add the **ChildLastName**, **ChildFirstName**, and **ChildPhone** fields from the **Children** table.
13. Save the query as **Participant List**.
14. Run the query and review the results.

### Add Criteria

*Now you will add criteria to the Participant List query to list the children signed up for 9:00 AM Saturday activities.*

15. Switch to **Design View**.

16. Create an AND condition by setting **Saturday** as a criterion in the Day field and **9:00** as a criterion in the MeetTime field.
17. Run the query.  
*Notice the only records returned are those where the day is Saturday AND the meet time is 9:00.*
18. Close the query, saving the changes.

## Use Wildcard Criteria

Now you will use a wildcard to select nearby donors so they can be invited to local activities.

19. Right-click the **Donations Query** query in the Navigation pane and choose **Design View**.
20. If necessary, scroll right through the field list until you locate the DonorZIP field.
21. Enter **34\*** in the DonorZIP **Criteria** field.  
*The asterisk is a wildcard character.*
22. Run the query.  
*Only records where the ZIP code begins with 34 are returned by the query.*

## Add Date Criteria

23. Switch to **Design View** and remove the **Criteria** from the DonorZIP field.
24. Enter **>01/01/2013** in the DonationDate **Criteria** field.
25. Run the query and review the results.

## Sort and Limit Query Results

26. Switch to **Design View**.
27. Set the **DonationDate** field to sort in **Descending** order.
28. Use the **Design**→**Query Setup**→**Return**  **menu button** ▼ list to limit the records returned to **5**.
29. Run the query and review the results.

## Add a Calculated Field and Format the Field

30. Switch to **Design View**.
31. Set the Return number back to **All**.
32. Create a calculated field by entering **NetAmt:Amount-ScholarFund** in the first empty column's **Field** row.
33. Right-click anywhere in the new calculated field column and open the Property Sheet.
34. Set the Format to **Currency** and type **Net Donation** as the **Caption**.
35. Run the query and review the results.
36. Close the query, saving the changes.
37. Close the database.

## Apply Your Skills

### APPLY YOUR SKILLS: A3-A1

#### Create Queries Using Criteria and Wildcards

The new CEO of Universal Corporate Events, has asked you to refine a number of queries to be more selective in data output. In this exercise, you will create queries; add criteria, wildcards, and AND/OR conditions to a query; and add date criteria to a query.

1. Open the **A3-A1-UCE** database from your **Access Chapter 3** folder and save it as **A3-A1-UCERevised**.

#### Create a Query Using the Query Wizard

2. Use the **Query Wizard** to create a simple select query and choose the **Personnel** table.
3. Add the **PerLastName**, **PerFirstName**, **PerPhone**, and **PerEmail** fields.
4. Use the query name **Personnel Contact List** and finish the query.
5. Review the results and then close the query.

#### Create a Multi-Table Query in Design View

6. Create a query in **Design View** that uses the **Events**, **Schedules**, and **Menus** tables.
7. Add the following fields to the query:
  - Events Table: **EventName**
  - Schedules Table: **VenueID**, **ContactID**, **EventDate**, **Guests**
  - Menus Table: **MenuPlan**, **Chg/PP**
8. Run the query and review the results.
9. Save the query as **Event List** then close it.

#### Use Wildcards and AND/OR Criteria

UCE, Ltd. is planning a recruiting event in Sarasota and would like to contact employees from greater Sarasota (area code 941) to involve them in planning the event. You will modify a query to return the records of personnel who live in the Sarasota area.

10. Open the **Personnel Contact List** query in **Design View**.
11. Type the wildcard text **\*941\*** in the PerPhone **Criteria** field.
12. Run the query and verify that each telephone number in the query results contains 941 somewhere in the number.
13. Close the query, saving the changes.
14. Create a new query in **Design View** from the **Venues** table that includes the **VenueName**, **VenueCity**, **VenuePhone**, and **VenueWebSite** fields.
15. Type **Sarasota** in the VenueCity **Criteria** field and **Tampa** in the **Or** row of the **VenueCity** field.
16. Run the query and verify that the city is *Sarasota* or *Tampa* in each record.
17. Save the query as **Tampa-Sarasota Venues** and then close the query.

## Add Date Criteria

18. Run the **Event List** query and notice the range of dates.
19. Switch to **Design View** and type **>May 1, 2014** in the EventDate **Criteria** field.
20. Sort the query in **Ascending** order on the **EventDate** field.
21. Run the query and make sure it produces the intended results.
22. Close the query, saving the changes, and then close the database.

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### APPLY YOUR SKILLS: A3-A2

## Limit the Records Returned and Use Calculated Fields

*You've been asked to improve UCE data retrieval and formatting. In this exercise, you will sort and limit records returned in query results and create a query using a calculated field.*

1. Open the **A3-A2-UCE** database from your **Access Chapter 3** folder and save it as **A3-A2-UCERevised**.

## Limit and Sort Query Results

2. Run the **Event Revenue** query and review the results.
3. Switch to **Design View** and set the sort order of the **TotalRev** calculated field to **Descending**.
4. Set the Return number to **5** to limit the number of records returned by the query to the top five.
5. Run the query and review the results.
6. Switch to **Design View** and change the Return value back to **All**.

## Add a Calculated Field and Format the Field

7. Use the name and expression **Comm:TotalRev\*.08** to create a calculated field.
8. Open the Property Sheet for the new calculated field and set the Format to **Currency** and use **Commission** as the Caption.
9. Run the query and review the results.
10. Close the query, saving the changes, and then close the database.

---

### APPLY YOUR SKILLS: A3-A3

## Create Select Queries Using Criteria and Calculated Fields

*In this exercise, you will create and modify a number of queries for more precise, targeted data selection for Universal Corporate Events.*

1. Open the **A3-A3-UCE** database from your **Access Chapter 3** folder and save it as **A3-A3-UCERevised**.

## Add a Wildcard Criterion

*To begin, you will create a query to list contact information for the event venues that have an 800 telephone number so they can be reached by phone at no charge to the caller.*

2. Create a simple query that uses the **Venues** table to generate a list of venue names and their corresponding phone numbers and websites.

3. Name the query **TollFreeVenues**.
4. In **Design View**, add the wildcard text **\*800\*** to the **Criteria** row to return only records where the Venue Phone number has 800 in it.
5. Run the query and resize the columns in the query results so that all the data is visible.
6. Close the query, saving the changes.

### Add Wildcard and Date Criteria and Sort the Query

*Because June is the most popular month for weddings, UCE wants to pay special attention to weddings scheduled for June so they can hire extra part-time workers.*

7. Use the **Query Wizard** to create a new simple query that uses the **Event List** query as a record source.
8. Include all of the Events List query fields in the new query.
9. Leave the Wizard's Detail or Summary option set to **Detail**.
10. Name the query **June Weddings** and finish the query.
11. Switch to **Design View**.
12. Add the wildcard text **Wed\*** (for *Weddings*) to the EventName **Criteria** field.
13. Set the sort order of the EventDate field to **Ascending**.
14. Enter the text **Between June 1, 2014 and June 30, 2014** in the EventDate **Criteria** field.
15. Run the query and review the results.
16. Close the query, saving the changes.

### Limit the Number of Records in Query Results

*Now you will sort the Location Scheduling query by the largest number of guests, and return the ten highest values so the company can focus extra personnel and resources to those events if the guests are scheduled for a full menu plan.*

17. Display the **Location Scheduling** query in **Design View**.
18. Sort the query in **Descending** order by **Guests**.
19. Set the number of records returned to **10**.  
*You'll need to click in the Return box and type 10. If Access changes the 10 to 100, delete the extra zero (0).*
20. Run the query and review the results.
21. Close the query, saving the changes.

### Add and Format Calculated Fields

*Now you will add a calculated field that subtracts the venue contact's commission from the total revenue to result in a net revenue amount.*

22. Display the **Event Revenue** query in **Design View**.
23. Add a calculated field named **NetRev** that subtracts **Comm** from **TotalRev**.
24. Format the new field as **Currency**, and give it the Caption **Net Revenue**.

25. Add a criterion to the **TotalRev** field to only choose records where the TotalRev is greater than 3000.
26. Run the query and review the results.
27. Close the query, saving the changes, and then close the database.

EVALUATION ONLY

## Extend Your Skills

*These exercises challenge you to think critically and apply your new skills. You will be evaluated on your ability to follow directions, completeness, creativity, and the use of proper grammar and mechanics. Save files to your chapter folder. Submit assignments as directed.*

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### A3-E1 That's the Way I See It

Blue Jean Landscaping needs queries to better manage its customer and equipment lists. Open the **A3-E1-BJL** database and save it as **A3-E1-BJLRevised**. Create a query named **813 Area Code** that uses all fields from the Customers table. The query should return only customers with a phone area code of 813 sorted in ascending order by city. Create another query named **Equipment Value** that uses all fields from the Equipment table. Use a calculated field named **EquipValue** to determine the total value of equipment by multiplying the Cost by the quantity In Stock. Sort the results with the largest Equipment Values appearing first and format the EquipValue field using the Currency format.

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### A3-E2 Be Your Own Boss

Blue Jean Landscaping wants to devise more targeted data retrieval. Open the **A3-E2-BJL** database and save it as **A3-E2-BJLRevised**. Create a query that will return a contact list for BJL's customers sorted by last name. Create another query that creates a customer mailing list sorted by ZIP code. Use a wildcard to select only records where the zip code begins with 33. Add a calculated field to the Sales Invoices query that multiplies Cost by Qty Sold to produce a total. Format the new field as Currency and assign it a caption. Finally, limit the number of records returned to the largest five invoice totals, so those customers can be targeted for preferred customer offers.

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### A3-E3 Demonstrate Proficiency

You've been asked by the management at Stormy BBQ to query their database. Open the **A3-E3-StormyBBQ** database and save it as **A3-E3-StormyBBQRevised**. Create a query that uses data from the DailyReceipts table and determines the total revenue received for each item using the ItemPrice and QtySold fields. Include all fields from the table in the query and sort in descending order on the field that is used to perform the daily total calculations. Create another query using the Merchandise table that contains all fields from the Merchandise table and a sequence of calculated fields. For each item, the calculated fields should determine the Stock Cost of that item (Cost \* Stock), the List Price Revenue if all items were sold at list price (Listprice \* Stock), and the Profit, which is the difference between the revenue and cost.