Microsoft

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Microsoft® Access® 2010

Your easy, colorful, SEE-HOW guide to Access!

Curtis D. Frye

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8 Creating Queries

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Database tables store data, but even the best-designed table has limitations. For example, if a table holds more than a few dozen records, it's difficult to look through the table and find records that meet a particular criterion. You might, for example, want to display all orders from a specific customer without having to wade through the entire table to find them.

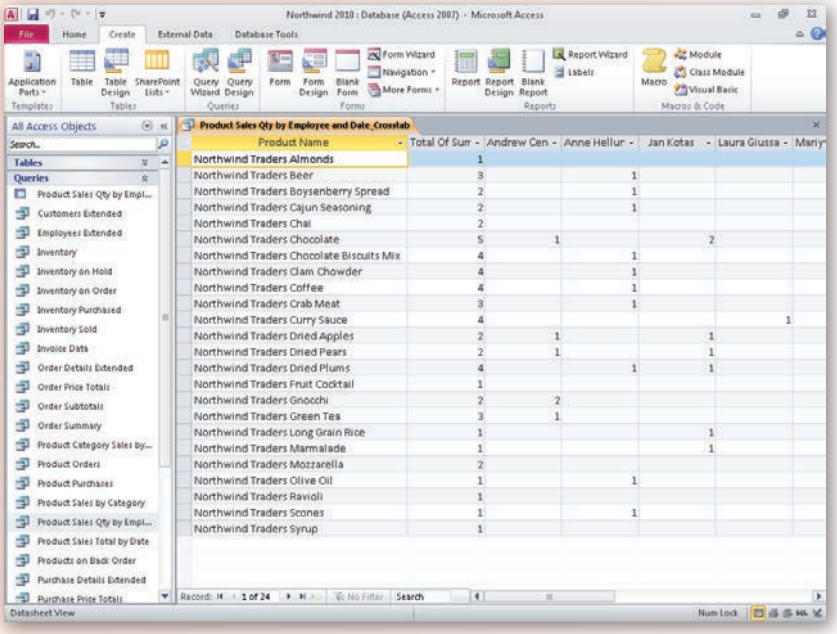
Enter the query. A query is a Microsoft Access 2010 object that lets you find just those table records you're interested in, whether you want to see all orders from customers in Germany or to identify customers who have never placed an order. You can also create queries that let you and your colleagues type the value for which they want to search. For example, rather than always search for orders by customers in Germany, you could create a query that asks which country to look for.

Introducing Query Types

When you want to retrieve table records that meet particular criteria, you create a query. The type of query you create, however, depends on the records you want to return and what, if anything, you want Access to do with the results.

The most basic query type is the select query, which reaches into one or more database tables and locates records. While you can have Access return every field in a record, you can also choose which fields are displayed in the results. For example, you could get information about customers that placed an order in a given month and, instead of displaying every field relating to the company, display just the company's name. You can also limit the records returned by the query by specifying one or more criteria or rules the query uses when deciding which table rows to return. If your table contains data that relates to two different values, such as a company name and sales representatives, you can create a crosstab query to display the quantity of items sold by each employee to each company (as shown in the following figure).

A version of the select query is the parameter query. Like a select query, the parameter query uses one or more criteria to limit the records returned by the query. The difference, however, is that a parameter query lets the person running the query specify the criteria Access uses to decide whether or not to return a specific record. You can add a message to the criteria entry dialog box that lets the searcher know what kind of value to enter.

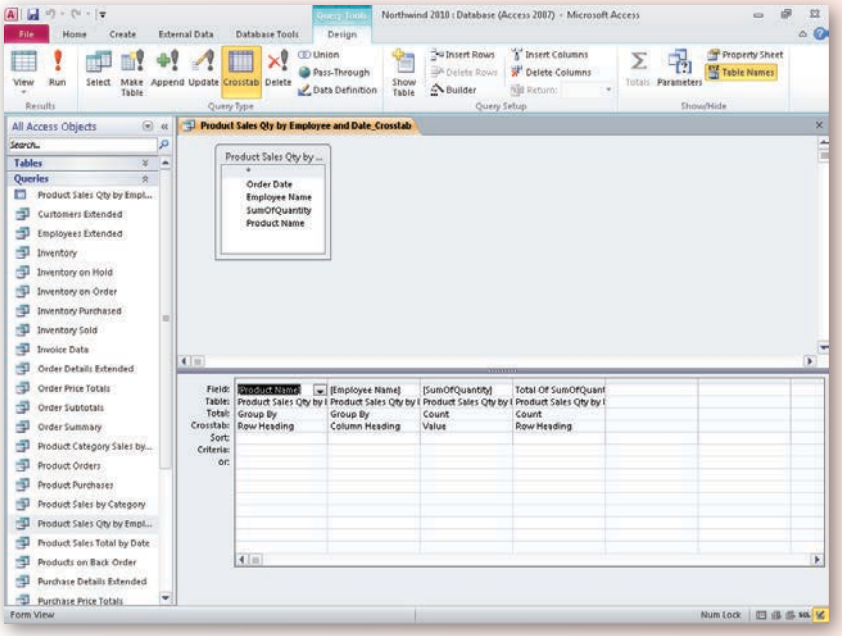


A separate type of query is the action query, which makes changes to the physical makeup of your database. You see two types of action queries in this chapter: the update query, which lets you change values in a table; and the make-table query, which writes query results to a new table in the current database (or another database entirely).

The final query type discussed in this section is the crosstab query. Unlike a select query, which presents its results in a worksheet, a crosstab query presents its results in a layout like that of a spreadsheet. Every value in the body of the query's results is related to two other values. In this case, those values are your suppliers and your product categories.

As in a spreadsheet, you can choose the mathematical operation Access uses to summarize the data in the body of the crosstab query's results. Available operations include finding a sum, average, the number of occurrences (as in the crosstab query results shown previously), or even the minimum or maximum value.

After you create a query (as shown following), you can display its results by double-clicking the query in the Navigation Pane. If the query is open in Design view, you can run it by clicking the Run button on the Design tab.

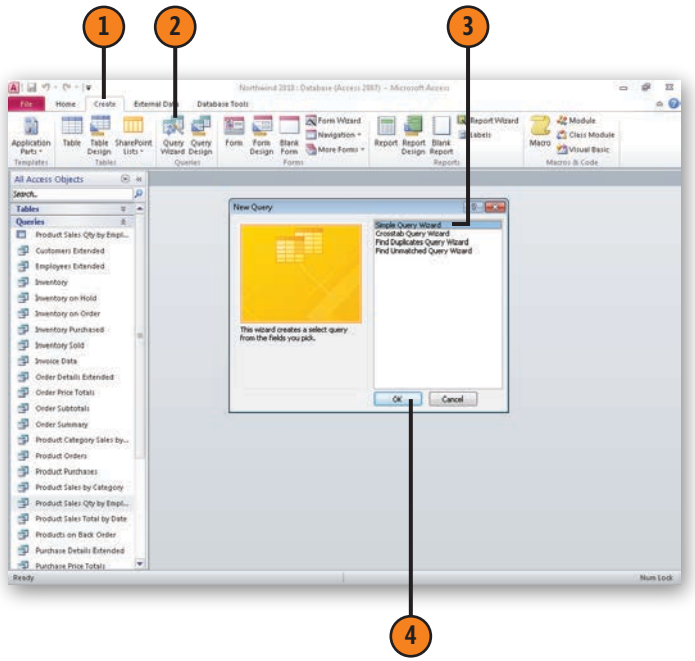


Creating a Query Using the Query Wizard

When you create a basic select query, you identify the table (or tables) with the data you want to find, name the fields to appear in the query results, and then save the query. The Query Wizard walks you through the process, making it easy to identify the tables and fields to appear in your query. What's more, you can choose whether to have Access display detailed results (that is, the individual query rows) or summarize the query's contents.

Create a Detail Query

1. Click the Create tab.
2. Click Query Wizard.
3. Click Simple Query Wizard.
4. Click OK.



Tip

To add all of a table's fields to your query, click the Add All (>>) button. You can also remove a field by clicking the Remove (<) button or remove all fields by clicking the Remove All (<<) button.

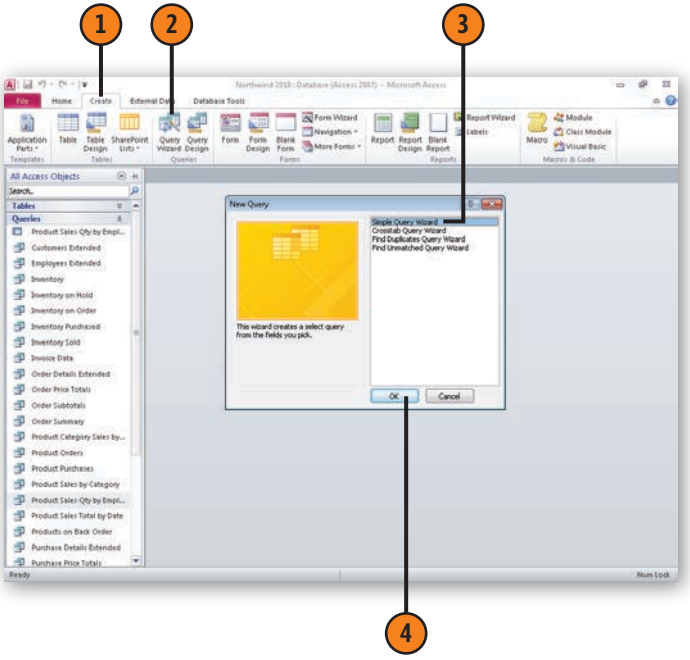
5. Click the Tables/Queries down arrow, and then click the table or query with the fields you want to use in your query.
6. Click the first field to include in the query's results.
7. Click Add.
8. Repeat steps 6 and 7 to add more fields (and step 5 to change the table or query from which you draw fields).
9. Click Next.
10. Click the Detail option button.
11. Click Next.
12. Type a name for your query.
13. Click Finish.

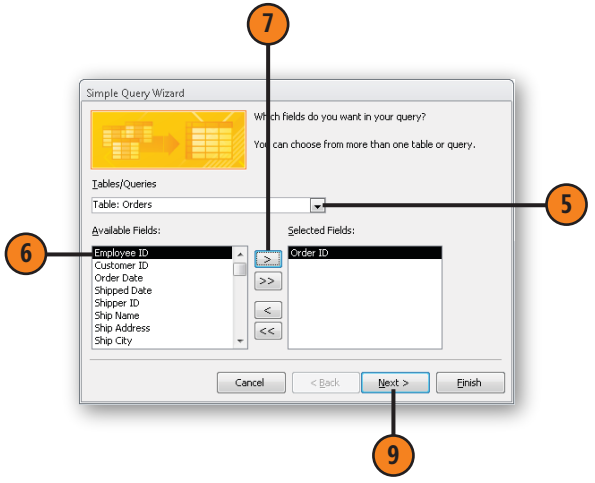
Tip

The step of the wizard that asks whether you want to create a detail or summary query appears only for some types of queries; don't panic if you don't see it.

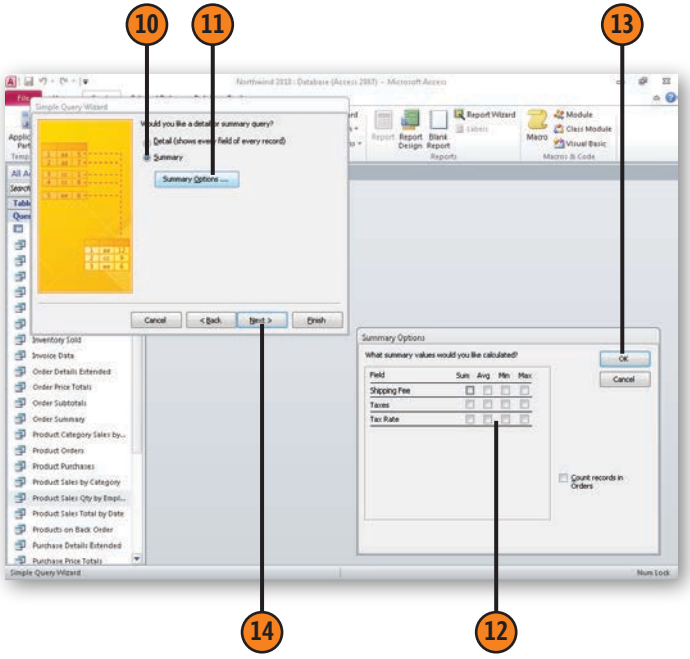
Create a Summary Query

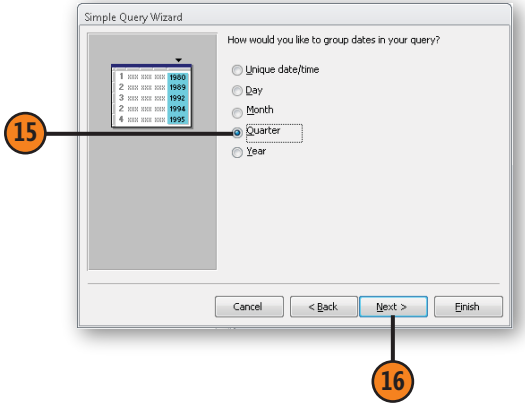
1. Click the Create tab.
2. Click Query Wizard.
3. Click Simple Query Wizard.
4. Click OK.
5. Click the Tables/Queries down arrow, and then click the table or query with the fields you want to use in your query.
6. Click the first field to include in the query's results.
7. Click Add.
8. Repeat steps 6 and 7 to add more fields (and step 5 to change the table or query from which you draw fields).
9. Click Next.

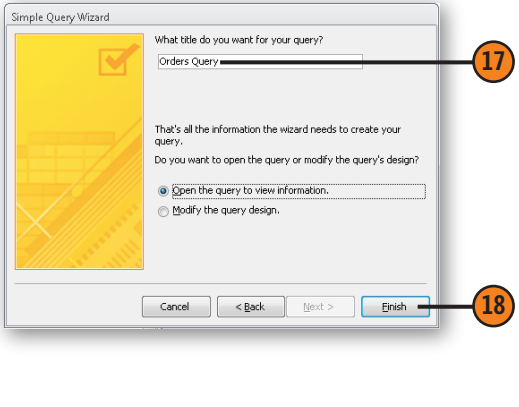




10. Click the Summary option button.
11. Click Summary Options.
12. Select the check boxes representing the summary values you want calculated.
13. Click OK.
14. Click Next.
15. Select the option button representing how you want the query to group rows in the query's source table.
16. Click Next.
17. Type a name for your query.
18. Click Finish.





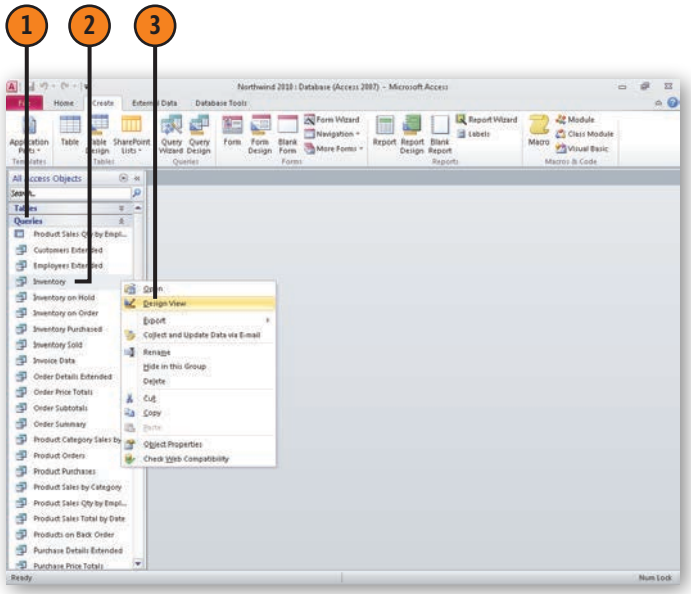


Editing a Query in Design View

After you create a query, you can modify it by opening it in Design view. In Design view, you can add a table to the Query design area, add or remove query fields, or even add every field from a table in one step.

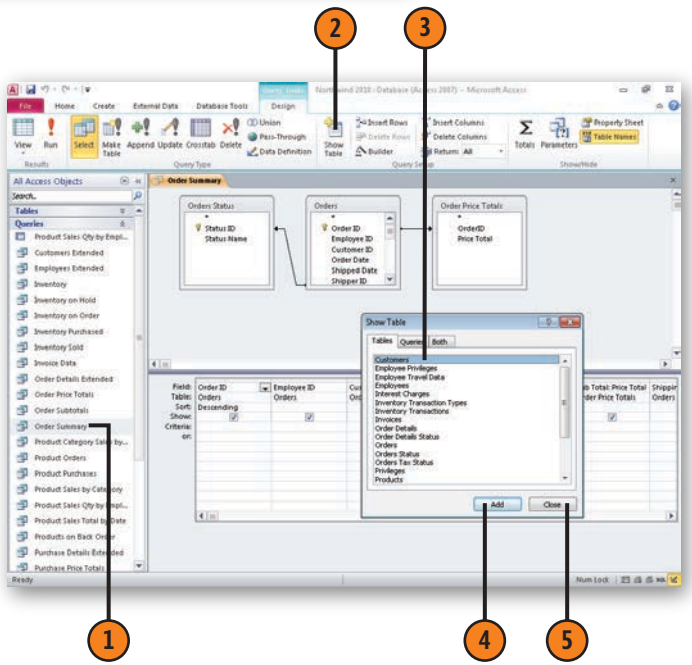
Open a Query for Editing

1. Display the queries in your database.
2. Right-click a query.
3. Click Design View.



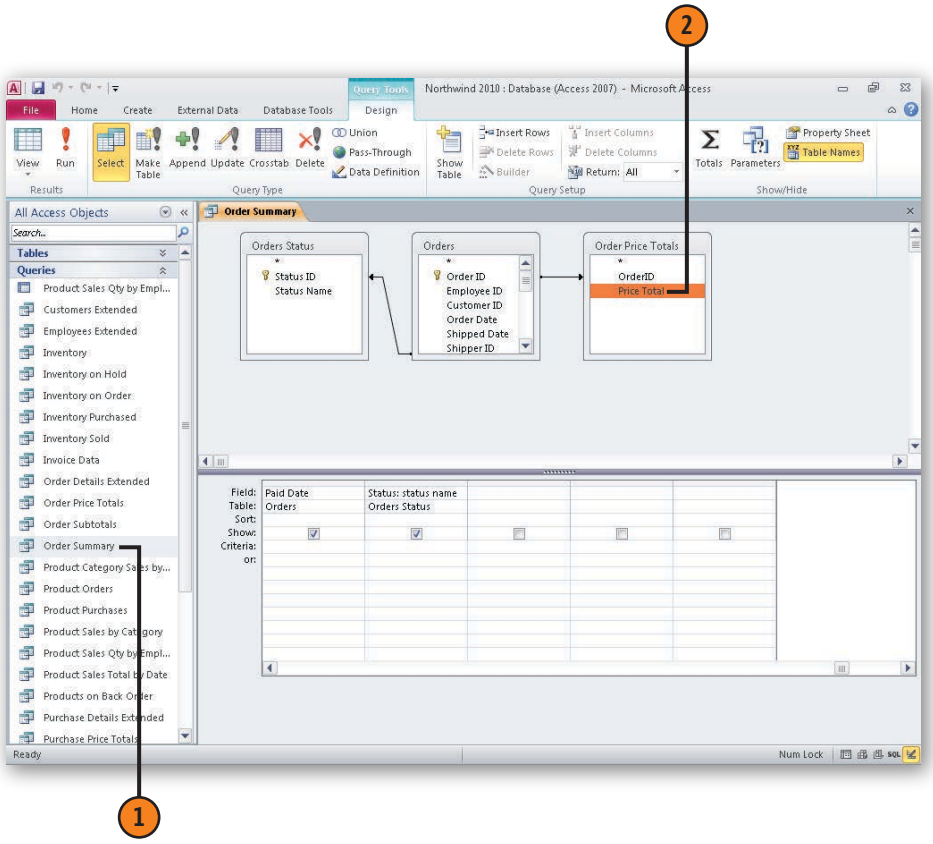
Add a Table to a Query

1. Open the query in Design view.
2. Click the Show Table button.
3. Click the table to add.
4. Click Add.
5. Click Close.



Add a Field to a Query

1. Open the query in Design view.
2. Drag a field to a Field cell.



Tip

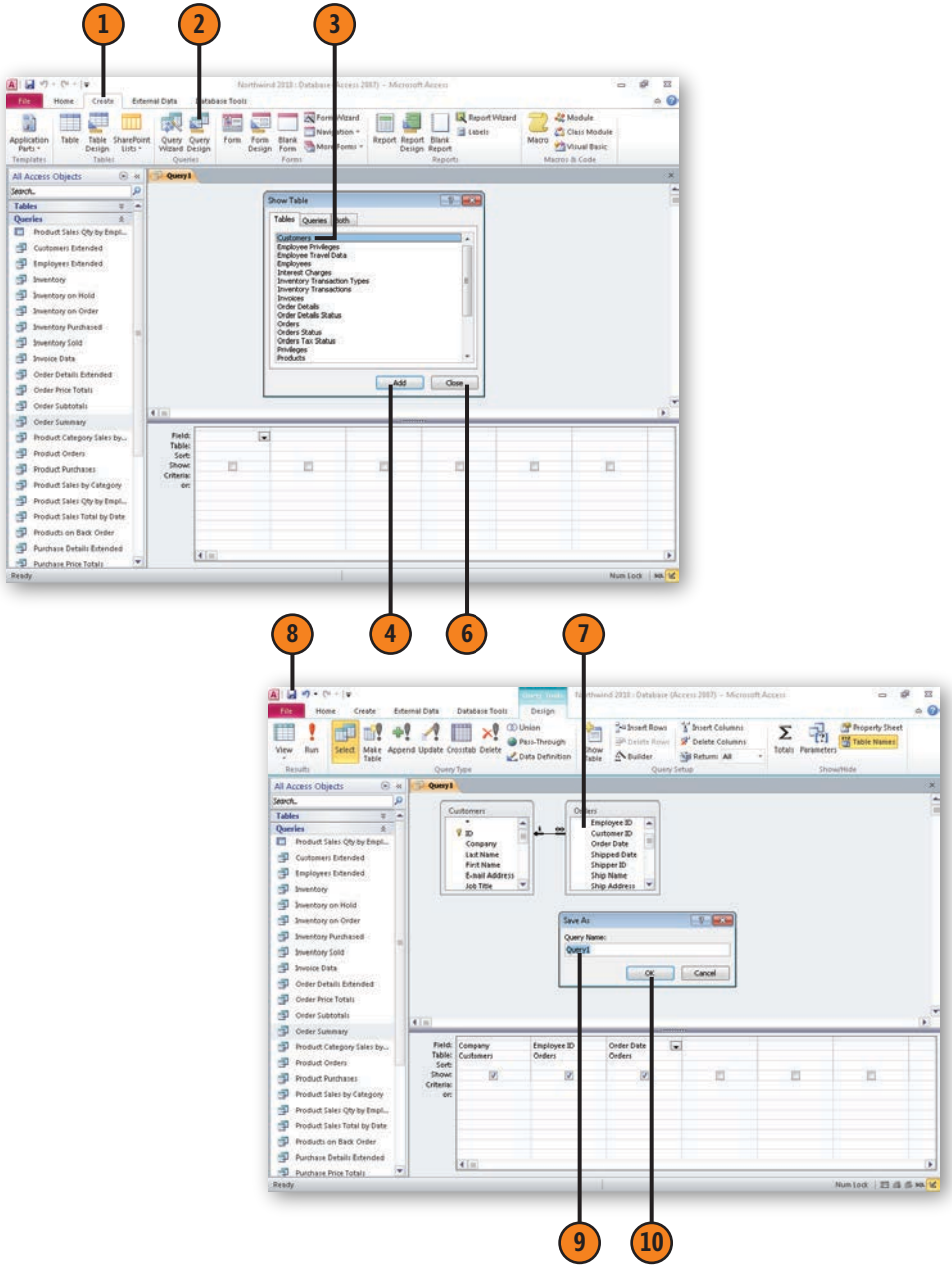
To add every field from a table to a query's results, drag the asterisk from the table's box in the table area to a Field cell in the Query design grid.

Tip

To enable a query with more than one table to return meaningful results, the two tables must be linked by a relationship.

Create a Query in Design View

1. Click the Create tab.
2. Click Query Design.
3. Click the first table or query you want to add.
4. Click Add.
5. Repeat steps 3 and 4 to add all the desired tables.
6. Click Close.
7. Drag fields to the design grid.
8. Click the Save button.
9. Type a name for the query.
10. Click OK.



Tip

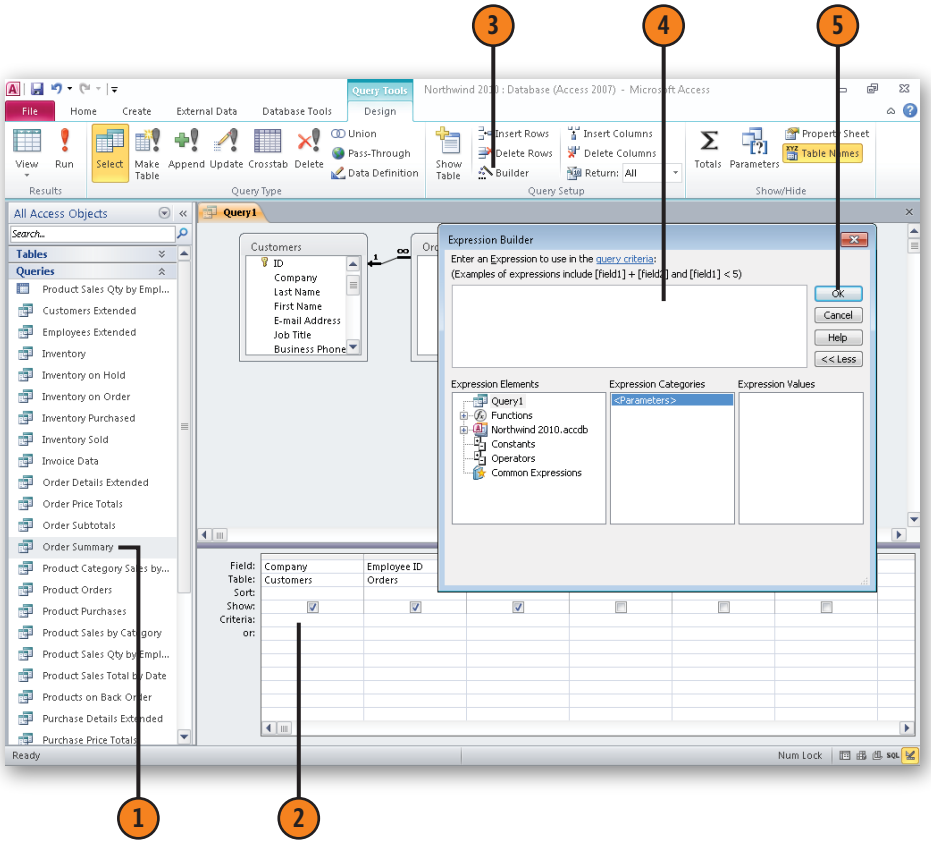
To remove a table from the design grid, right-click the table's title bar and then click Remove Table.

Using Criteria to Focus Query Results

It's unlikely that you'll want your query to find every record in a table—if you did, you could just open the table and not bother with the query! To limit the records a query locates, such as finding customers only in Germany, you can add criteria to the fields in the Query design grid.

Set Query Criteria

1. Open a query in Design view.
2. Click the Criteria cell for the field to which the criterion will be applied.
3. Click Builder.
4. Create the criterion in the Expression Builder.
5. Click OK.



Tip

You can also type the criterion into the Criteria cell directly.

Tip

To use a text string, enclose the string in quotation marks (for example, "Germany"). If you forget, Access adds the quotes if it recognizes the criterion as a text string.

Introducing Operators

There are several types of database objects and tools you need to use when you create a criterion to narrow the records returned by a query or to calculate a value. The first set of objects to which you need to refer includes database tables and their fields. For example, to calculate the subtotal of a line in the Northwind sample database's Order Details table, multiply the Unit Price by the Quantity ordered, and adjust the total if the customer gets a discount (as noted in the Discount field). The expression to perform the first part of that calculation is [Order Details]![UnitPrice]*[Order Details]![Quantity].

Note that table fields are called out with the name of the table enclosed in square brackets, an exclamation point, and then the name of the field in square brackets.

Arithmetic Operators

Operator	Description
-	Subtraction (6-4=2)
*	Multiplication (6*4=24)
/	Division (6/4=1.5)
\	Integer division (6\4=1)
+	Addition (6+4=10)
Mod	Modular division (6 Mod 4=2)

Comparison Operators

Operator	Description
<	Less than
<=	Less than or equal to
<>	Not equal to
=	Equal to
>=	Greater than or equal to
>	Greater than
Between "Value1" And "Value2"	Between two values, inclusive (for example, Between "1" And "3" would return "1, 2, 3")

Logical Operators

Operator	Description
AND	Both elements of an expression must be true.
NOT	The expression must evaluate as false.
OR	At least one element of an expression must be true.
XOR	Exactly one element of an expression must be true, not both.

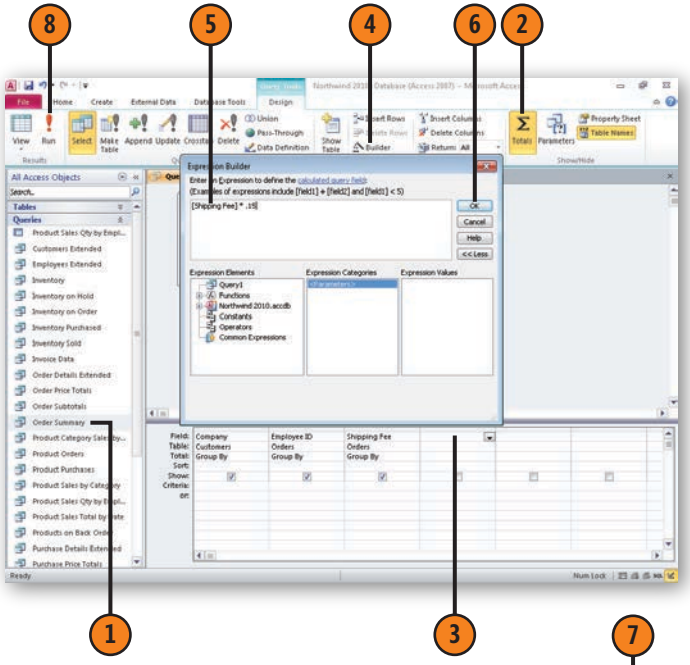
Using Queries to Calculate Values

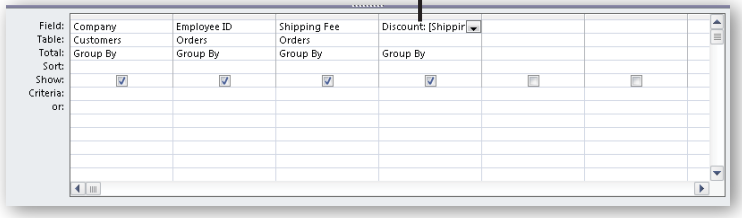
One popular use for database tables is to maintain sales records with fields for the order identifier, the product ordered, and the product's price. What you can't do in a table is perform a calculation—the fields are just designed to hold data.

In a query, however, you can find totals, averages, or even the minimum or maximum value in the records found by your query.

Calculate a Value in a Query

1. Open a query in Design view.
2. Click Totals to add the Total row to the Query design grid.
3. Click the Field cell in the column in which you want to calculate the value.
4. Click Builder.
5. Build the calculation in the Expression Builder.
6. Click OK.
7. In the Field cell with the calculation, edit the value to the left of the colon to reflect the name you want for the field when the query results are displayed as a worksheet.
8. Click Run.





Tip

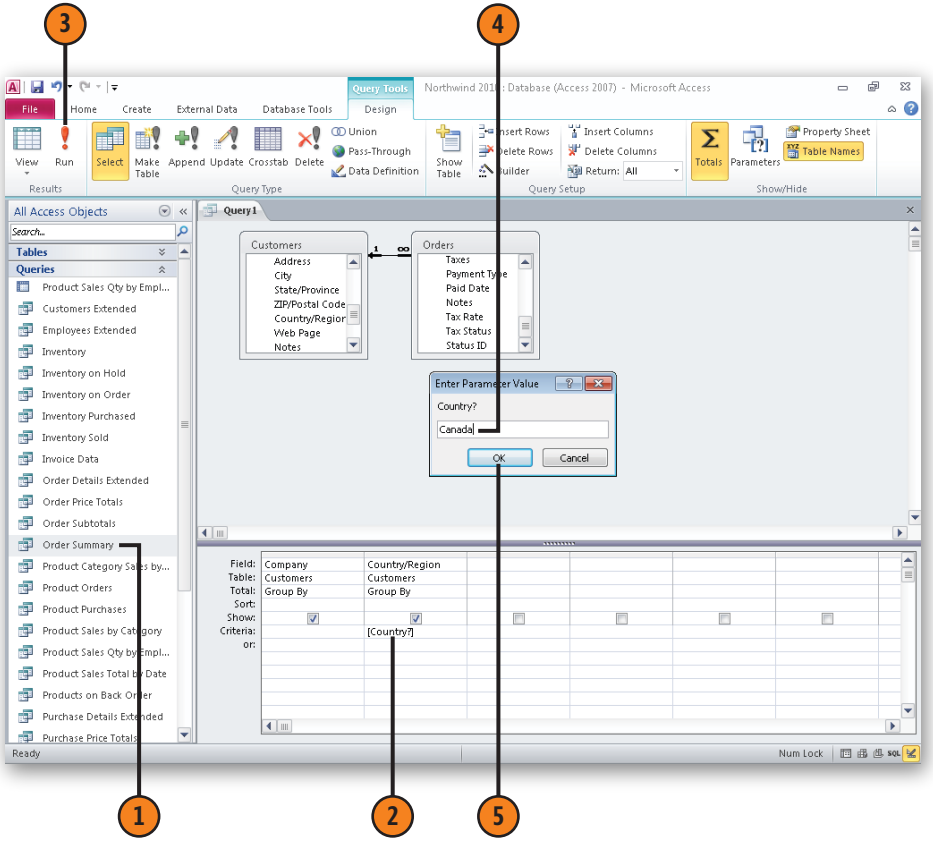
To select fields from other tables for use in a calculation, double-click the Tables icon in the left pane of the Expression Builder, double-click the table with the target field, and then double-click the field name in the center pane.

Creating a Parameter Query

Some of the time, you can create a query that always looks for the same information, such as orders from a specific country or the total orders from an established customer. Other times, however, you and your colleagues need the flexibility to enter a criterion (such as a country) into the query to focus the results correctly. You can do that by creating a parameter query, which lets you specify the criterion the query uses to find records.

Build a Parameter Query

1. Open a query in Design view.
2. Type the prompt surrounded by square brackets in the Criteria cell in the column representing the field in which you want to find the entered value.
3. Click Run to test the query.
4. Type a value in the message box that appears.
5. Click OK.



Caution

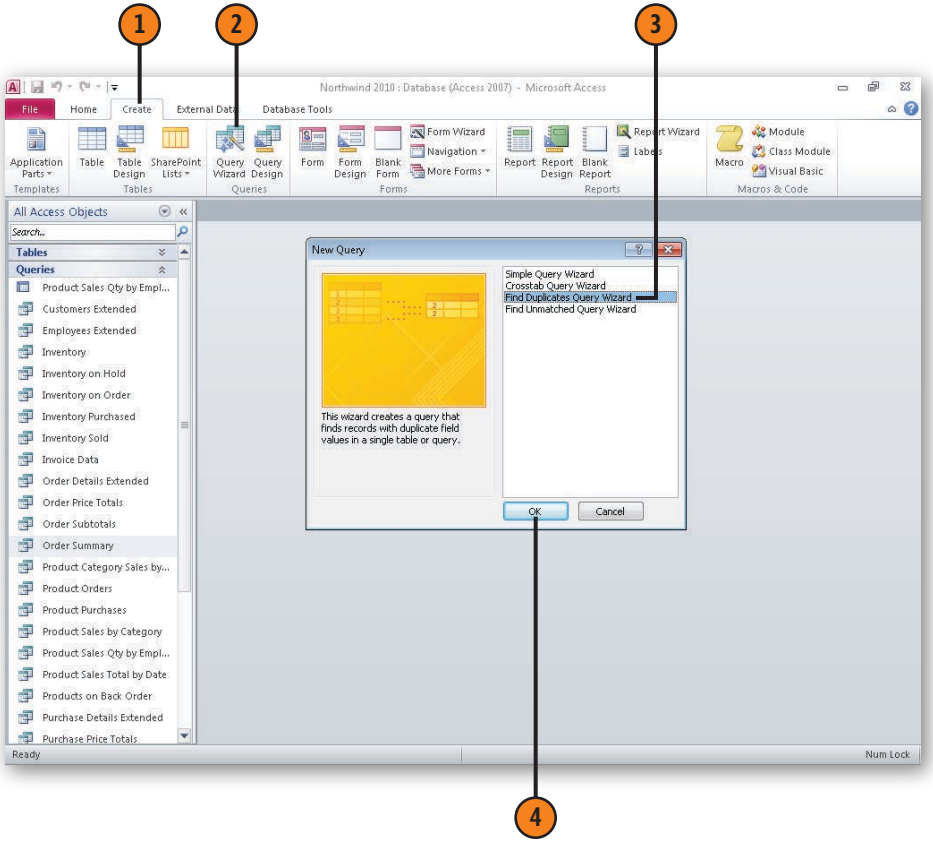
If you don't type a prompt between the square brackets, the only indication you get to enter a parameter is a blank dialog box. If someone unfamiliar with the database runs the query, he or she will have no idea what to type in the box.

Finding Duplicate Records

The standard select query locates records that meet a criterion, such as orders made by a particular customer during a given month. However, you might also be interested in finding those customers who placed more than one order in a month. If all orders for a month are recorded in the same table, you could create a Find Duplicates query to locate CustomerID values that occur more than once in the table.

Create a Find Duplicates Query

1. Click the Create tab.
2. Click Query Wizard.
3. Click Find Duplicates Query Wizard.
4. Click OK.



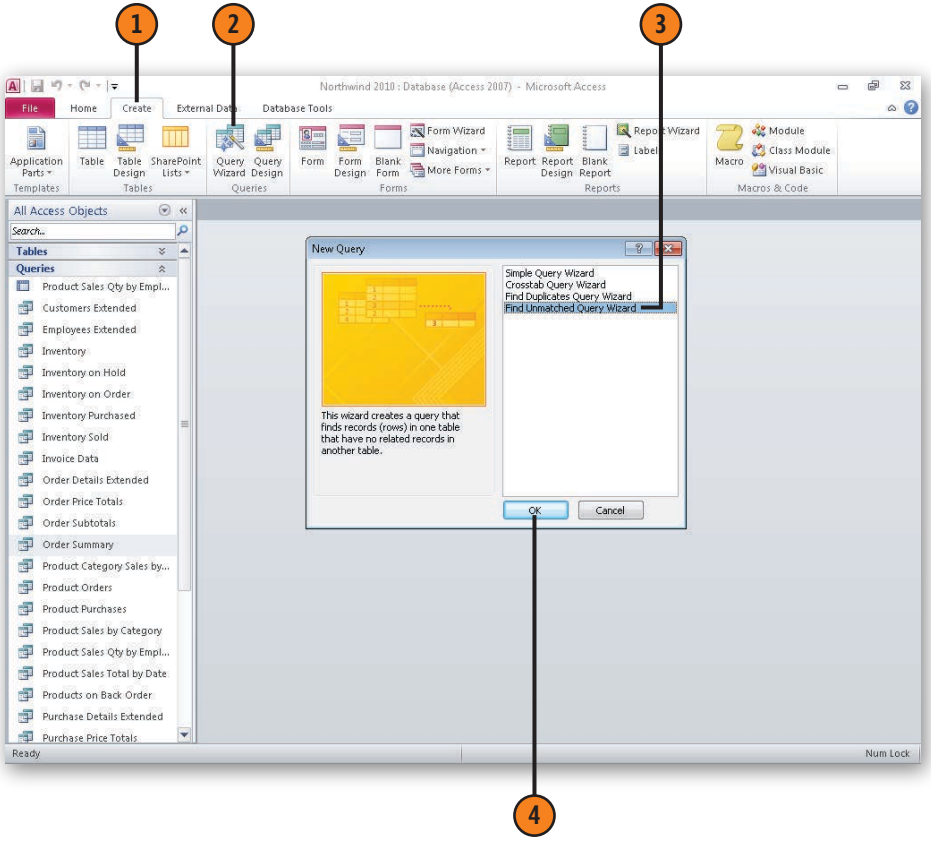
5. Click the table in which you want to find duplicate information.
6. Click Next.
7. Click the field that might contain duplicate information.
8. Click Add.
9. Repeat steps 7 and 8 to add any other fields to the query.
10. Click Next.
11. Click any other field you want to display in the query results.
12. Click Add.
13. Repeat steps 11 and 12 as necessary.
14. Click Next.
15. Type a name for the query.
16. Click Finish.

Finding Unmatched Records

When two tables are in a one-to-many relationship, you can create a Find Unmatched Records query to identify any records in the table on the "one" side that have no corresponding records in the table on the "many" side. For example, in the Northwind sample database, because the Customers and Orders tables are in a one-to-many relationship, you could identify customers that have never placed an order.

Create a Find Unmatched Records Query

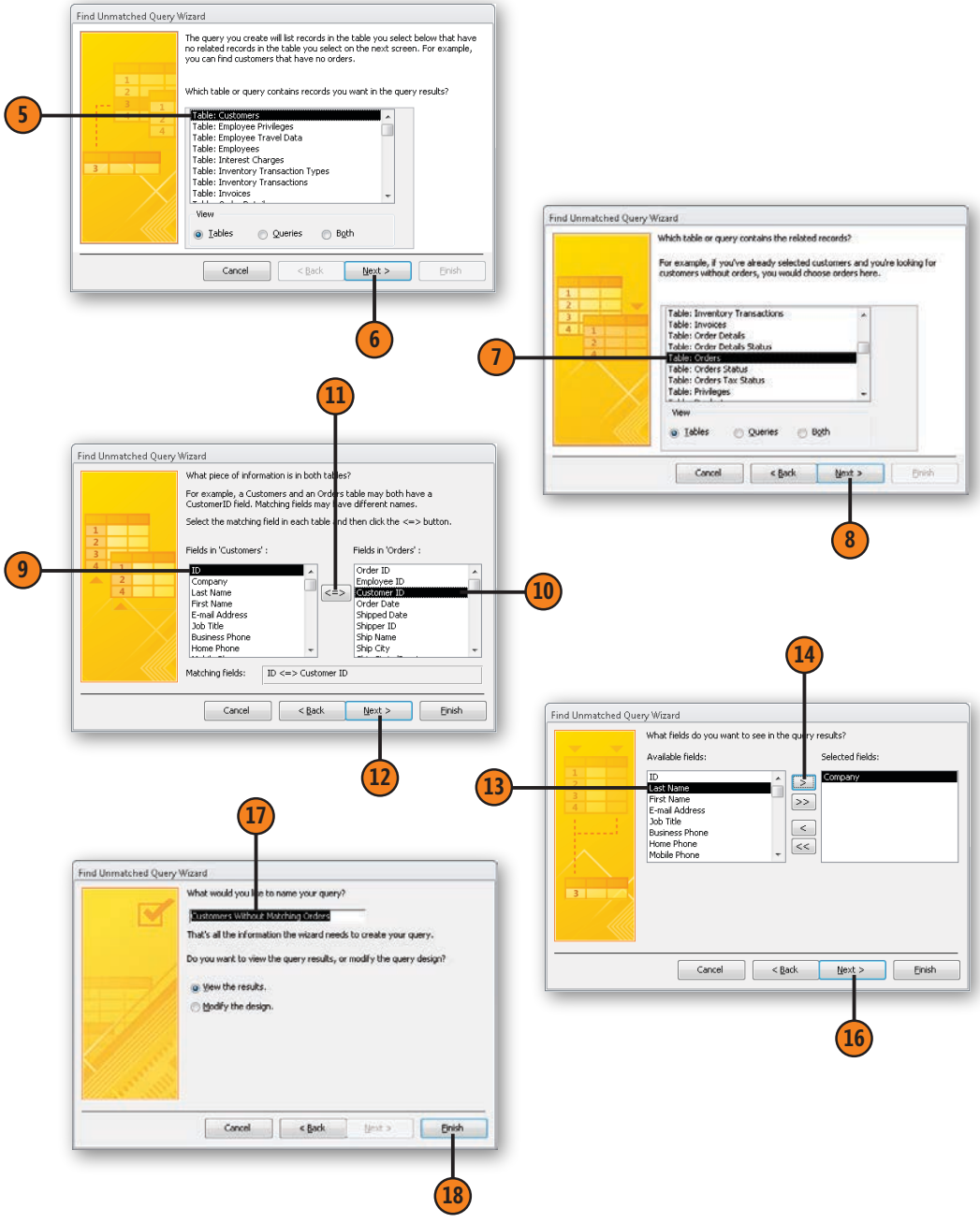
1. Click the Create tab.
2. Click Query Wizard.
3. Click Find Unmatched Query Wizard.
4. Click OK.



Try This!

Open the Northwind sample database, click the Create tab, click the Query Wizard button, click Find Unmatched Query Wizard, and then click OK. Click Table: Customers and then click Next. In the next screen, click Table: Orders and then click Next. Verify that ID is highlighted in the Customers table and that CustomerID is highlighted in the Orders table; then click Next. Click Company, click the Add button, and then click Next. In the final screen, click Finish to accept the query name Access suggests. The query you create displays customers that have not placed an order.

5. Click the table in which you want to find unmatched records.
6. Click Next.
7. Click the table or query with related records.
8. Click Next.
9. If necessary, click the field in the left pane that is in the table on the "one" side of the relationship.
10. If necessary, click the field in the right pane that is in the table on the "many" side of the relationship.
11. Click the Match button to identify the equivalent fields.
12. Click Next.
13. Click the name of a field to display in the query results.
14. Click Add.
15. Repeat steps 13 and 14 as needed to add fields to the display.
16. Click Next.
17. Type a name for the query.
18. Click Finish.

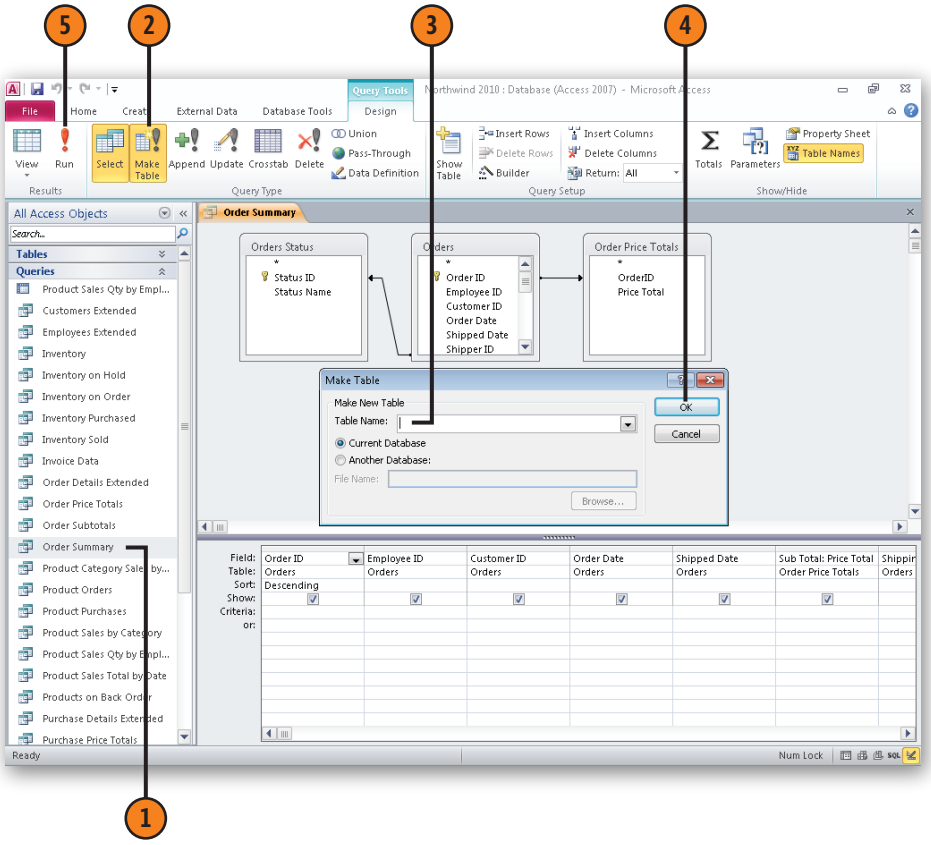


Writing Query Results to a New Table

When you run a query, Access writes the records the query finds into a dynaset, or dynamic record set. While Access remembers the results of queries you run, the results aren't actually written to a table, limiting what you can do with the data. You can, however, modify a select query so the results are written to a new table.

Create a Make-Table Query

1. Open a query in Design view.
2. Click Make Table.
3. Type a name for the new table.
4. Click OK.
5. Click Run.
6. Click Yes to create a new table that contains the selected records.



Tip

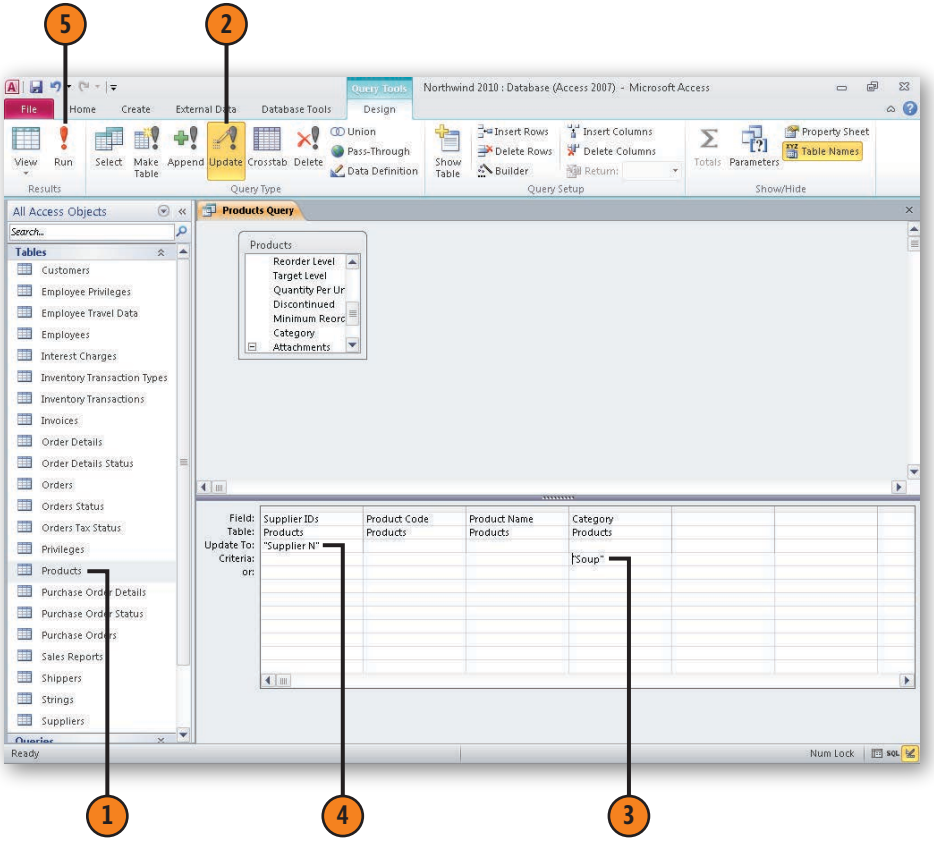
You can write the results of your query to a table in another database by selecting the Another Database option in the Make Table dialog box, clicking the Browse button, and using the file navigation dialog box to identify the database to receive the table.

Creating an Update Query

One exciting aspect of business is how quickly things change—of course, it can be difficult to keep track of all those changes! One useful task you can perform with an update query is to modify values in a table to reflect changes in your business environment. For example, if a supplier increases prices by 5 percent, you can create an update query that moves through your Products table and updates the records for that supplier's products.

Update Table Values with a Query

1. Open a query in Design view.
2. Click Update.
3. In the Criteria cell of the column you'll use to select the records to update, type the expression used to select which values should be updated.
4. In the Update To cell of the column that contains the value to be updated, type the expression used to update the values.
5. Click Run.



See Also

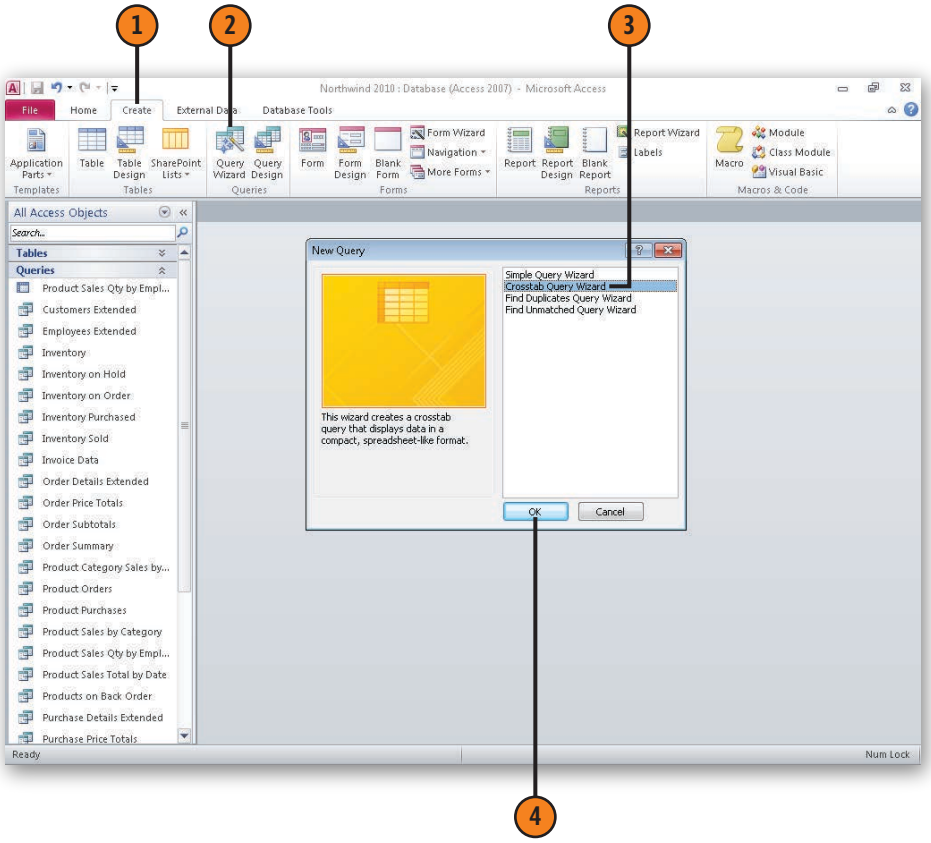
For more information about ensuring that table data is updated to reflect changes in a related table, see "Enforcing Referential Integrity" on page 46.

Creating a Crosstab Query

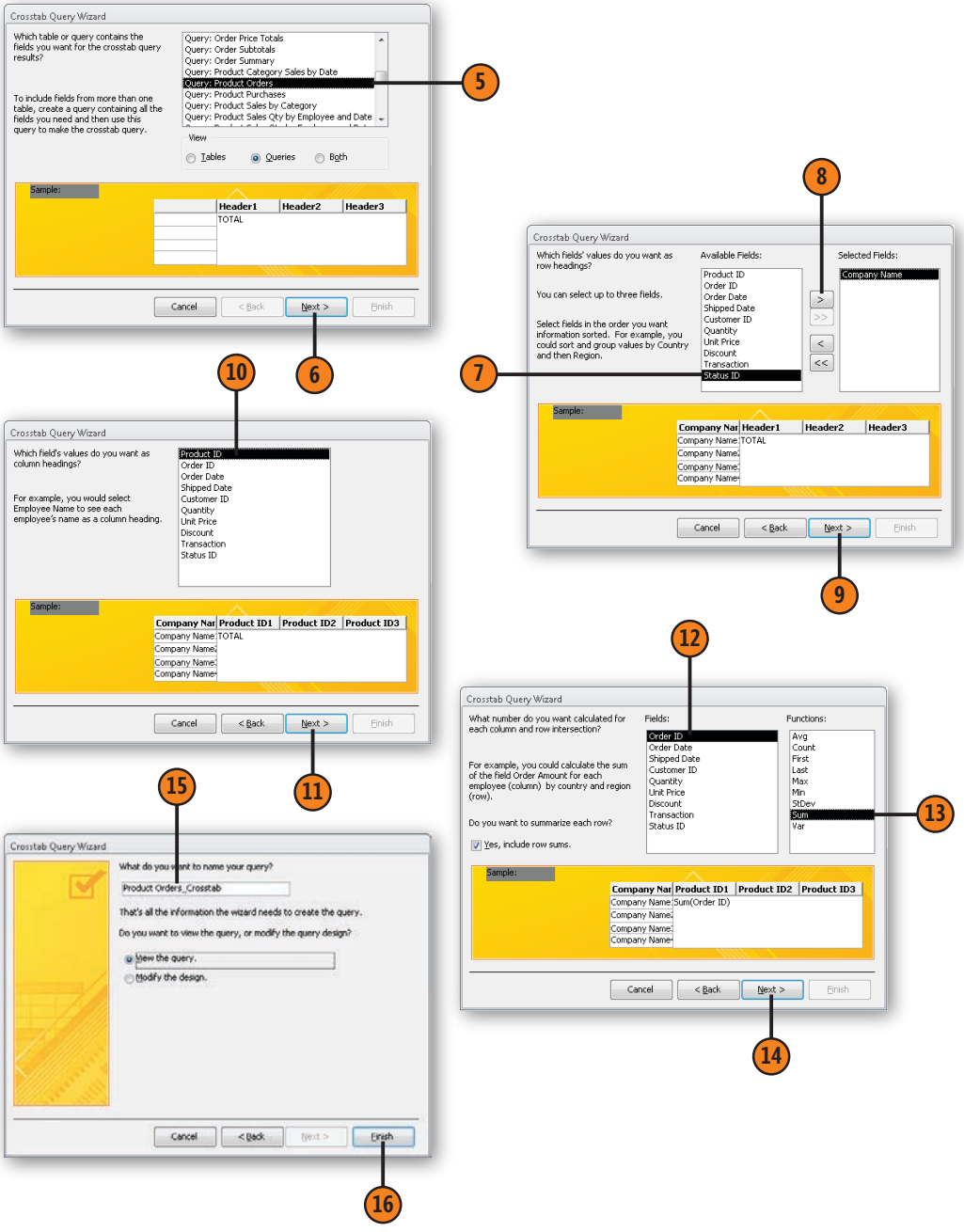
The basic means of storing and presenting data in Access is the table, which is essentially a list of information about a group of "things" (such as customer orders) related to a single primary key value. Another way to present data is in a crosstab query, which relates one value (such as a total or an average) with two other values (such as a customer and a month).

Build a Crosstab Query

1. Click the Create tab.
2. Click Query Wizard.
3. Click Crosstab Query Wizard.
4. Click OK.



5. Click the table or query to provide the values for your crosstab query.
6. Click Next.
7. Click the field to provide values for the row headings.
8. Click Add.
9. Click Next.
10. Click the field to provide values for the column headings.
11. Click Next.
12. Click the field to provide values for the data area (body) of the crosstab query.
13. Click the summary calculation to be performed on the values in the data area.
14. Click Next.
15. Type a name for the query.
16. Click Finish.

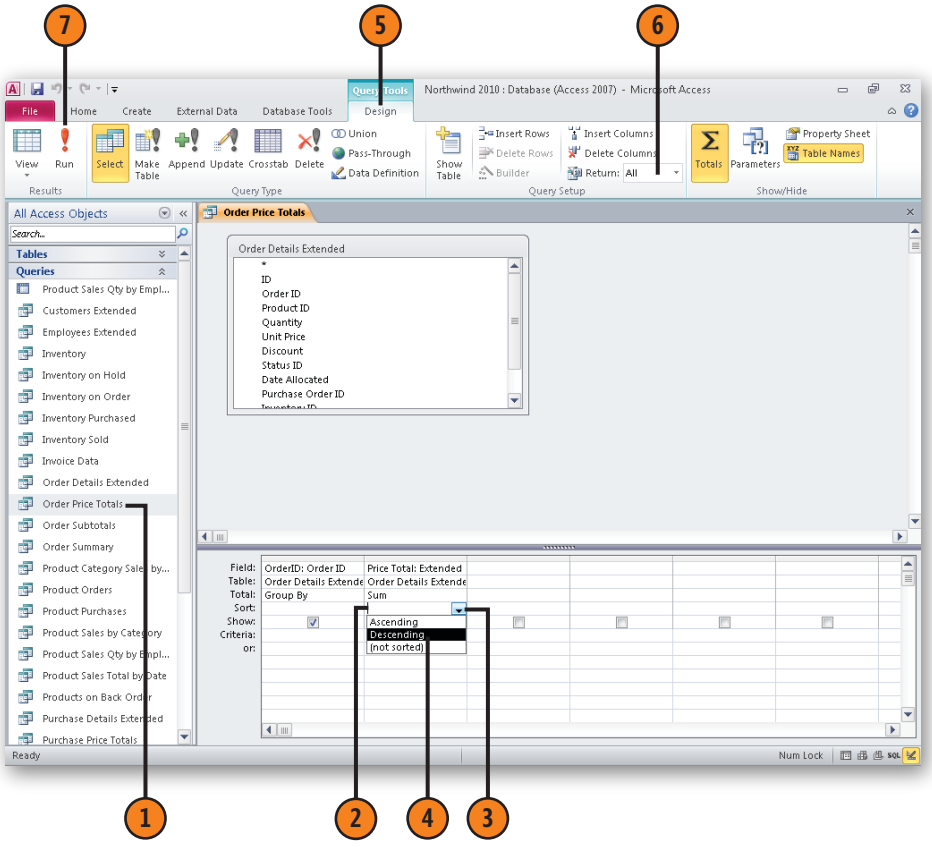


Finding the Largest and Smallest Values in a Field by Using a Query

When you create a query, you can have Access display a set number of the highest and lowest values in the query's results. You can also have Access display rows that contain the top or bottom values by asking Access to display a certain percentage of rows in the query's results. For example, if you reward the top 10 percent of your sales staff, you can create a query that sorts the query results according to the values in the Total Sales field and displays the best values. When you filter a query's results by a percentage, you don't need to know the exact number of records in your table. In other words, if your sales staff is made up of 40 employees, creating a query that displays the top 10 percent of sales totals will return the top 4 representatives.

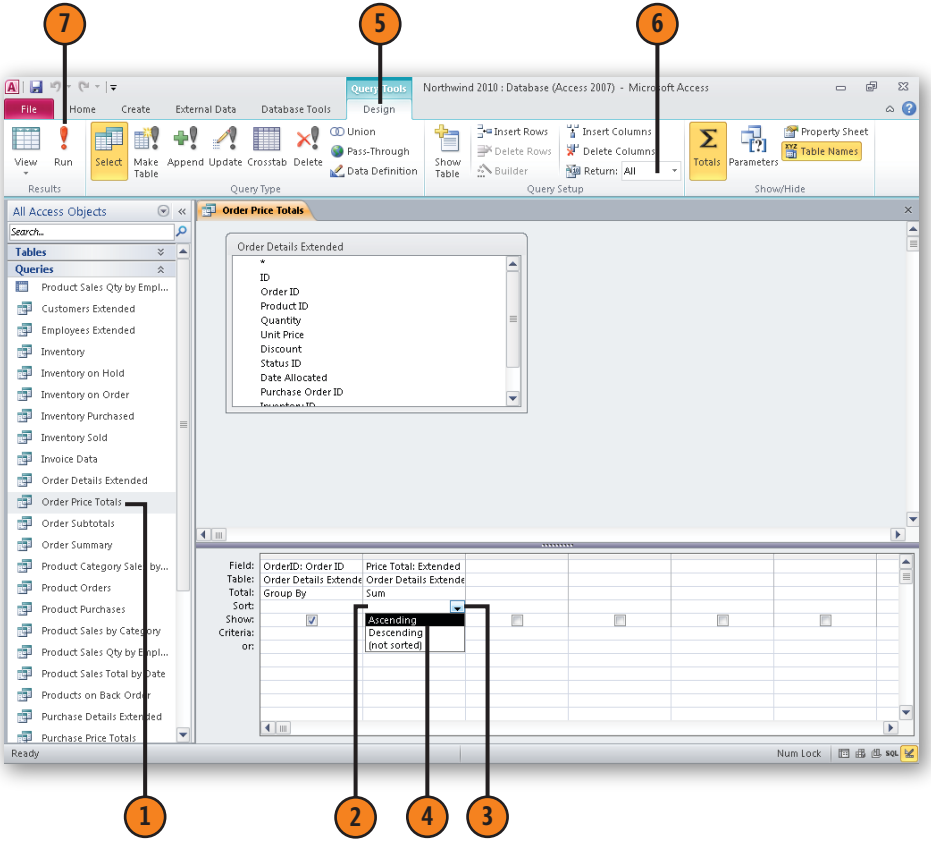
Find the Largest Values in a Field

1. Open a query in Design view.
2. Click the Sort cell of the field in which you want to find the top values.
3. Click the down arrow that appears.
4. Click Descending.
5. If necessary, click the Design tab.
6. Using the Top Values field control, perform any of these tasks:
   - Click the control's down arrow and select a default value to specify the number of values or the percentage of values to display.
   - Type a number indicating the number of values you want displayed in the query results.
   - Type a percentage indicating the portion of the table's rows you want displayed in the query results.
7. Click Run.



Find the Smallest Values in a Field

1. Open a query in Design view.
2. Click the Sort cell of the field in which you want to find the top values.
3. Click the down arrow that appears.
4. Click Ascending.
5. If necessary, click the Design tab.
6. Using the Top Values field control, perform any of these tasks:
   - Click the control's down arrow and select a default value to specify the number of values or the percentage of values to display.
   - Type a number indicating the number of values you want displayed in the query results.
   - Type a percentage indicating the portion of the table's rows you want displayed in the query results.
7. Click Run.



Tip

To have your query display all its results, return to Design view, click the Design tab, click the Top Values field's down arrow, and then click All.

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About the Author

Curtis D. Frye is the author of *Microsoft Office Excel 2007 Step by Step*, *Microsoft Excel Version 2007 Plain & Simple*, several books on Microsoft Access, and numerous online training courses. He is a coauthor of *Microsoft Office Excel 2003 Programming Inside Out*.