

Introduction

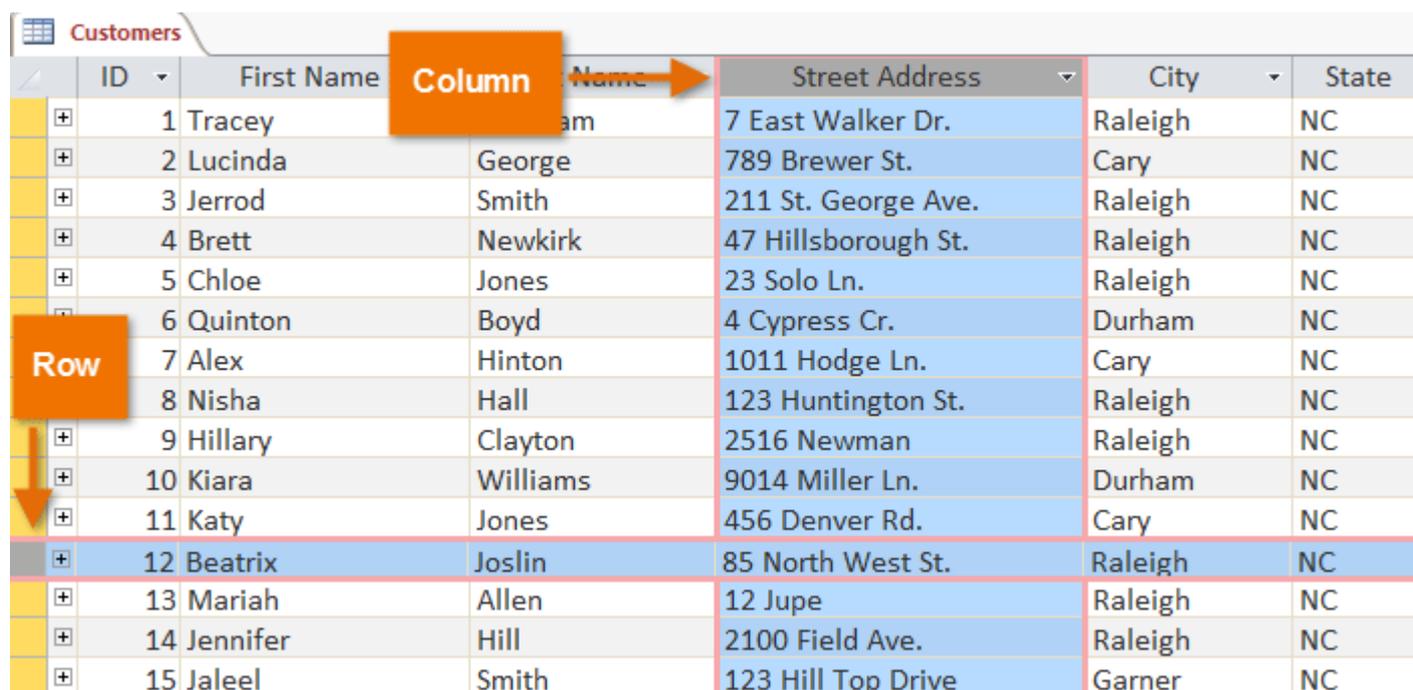
Databases in Access are composed of four objects: **tables**, **queries**, **forms**, and **reports**. Together, these objects allow you to enter, store, analyze, and compile your data however you want.

In this lesson, you will learn about each of the four **objects** and come to understand how they interact with each other to create a fully functional relational database.

Tables

By this point, you should already understand that a database is a collection of data organized into many connected **lists**. In Access, all data is stored in **tables**, which puts tables at the heart of any database.

You might already know that tables are organized into vertical **columns** and horizontal **rows**.



ID	First Name	Last Name	Street Address	City	State
1	Tracey	Ham	7 East Walker Dr.	Raleigh	NC
2	Lucinda	George	789 Brewer St.	Cary	NC
3	Jerrold	Smith	211 St. George Ave.	Raleigh	NC
4	Brett	Newkirk	47 Hillsborough St.	Raleigh	NC
5	Chloe	Jones	23 Solo Ln.	Raleigh	NC
6	Quinton	Boyd	4 Cypress Cr.	Durham	NC
7	Alex	Hinton	1011 Hodge Ln.	Cary	NC
8	Nisha	Hall	123 Huntington St.	Raleigh	NC
9	Hillary	Clayton	2516 Newman	Raleigh	NC
10	Kiara	Williams	9014 Miller Ln.	Durham	NC
11	Katy	Jones	456 Denver Rd.	Cary	NC
12	Beatrix	Joslin	85 North West St.	Raleigh	NC
13	Mariah	Allen	12 Jupe	Raleigh	NC
14	Jennifer	Hill	2100 Field Ave.	Raleigh	NC
15	Jaleel	Smith	123 Hill Top Drive	Garner	NC

In Access, rows and columns are referred to as **records** and **fields**. A **field** is more than just a column; it's a way of organizing information by the **type** of data it is. Every piece of information within a field is of the same **type**. For

example, every entry in a field called **First Name** would be a name, and every entry in field called **Street Address** would be an address.

ID	First Name	Last Name	Street Address
1	Tracey	Beckha	7 East Walker Dr.
2	Lucinda	George	789 Brewer St.
3	Jerrod	Smith	211 St. George Ave.
4	Brett	Newkirk	47 Hillsborough St.
5	Chloe		23 Solo Ln.
6	Quinton		4 Cypress Cr.
7	Alex		1011 Hodge Ln.
8	Nisha	Hall	123 Huntington St.
9	Hillary	Clayton	2516 Newman
10	Kiara	Williams	9014 Miller Ln.
11	Katy	Jones	456 Denver Rd.
12	Beatrix	Joslin	85 North West St.

Likewise, a **record** is more than just a row; it's a unit of information. Every cell in a given row is part of that row's record.

ID	First Name	Last Name	Street Address	City	State
1	Tracey	Beckham	7 East Walker Dr.	Raleigh	NC
2	Lucinda	George	789 Brewer St.	Cary	NC
3	Jerrod	Smith	211 St. George Ave.	Raleigh	NC
4	Brett	Newkirk	47 Hillsborough St.	Raleigh	NC
5	Chloe	Jones	23 Solo Ln.	Raleigh	NC
6	Quinton	Boyd	4 Cypress Cr.	Durham	NC
7	Alex	Hinton	1011 Hodge Ln.	Cary	NC
8	Nisha	Hall	123 Huntington St.	Raleigh	NC
9	Hillary	Clayton	2516 Newman	Raleigh	NC
10	Kiara	Williams	9014 Miller Ln.	Durham	NC
11	Katy	Jones	456 Denver Rd.	Cary	NC

Notice how each record spans several fields. Even though the information in each record is organized into fields, it belongs with the other information in that record. See the **number** at the left of each row? It's the **ID number** that identifies each record. The ID number for a record refers to every piece of information contained on that row.

ID	First Name	Last Name
40	Vig	Aurelio
41	Jeffery	Bergman
42	William	Bittiman
43	Megan	
44	Elk	
45	Marjan	
46	Colin	Hopkins
47	Hakim	Auden
48	Pilar	Semana
49	Eliza	Harris
50	Chloe	Ford
51	Juanita	Harris

Record ID Numbers

Tables are good for storing **closely related information**. Let's say you own a bakery and have a database that includes a table with your customers' names and information, like their phone numbers, home addresses, and email addresses. Because these pieces of information are all details on your customers, you'd include them all in the same **table**. Each customer would be represented by a unique **record**, and each type of information about these customers would be stored in its own field. If you decided to add any more information—say, a customer's birthday—you would simply create a new field within the same table.

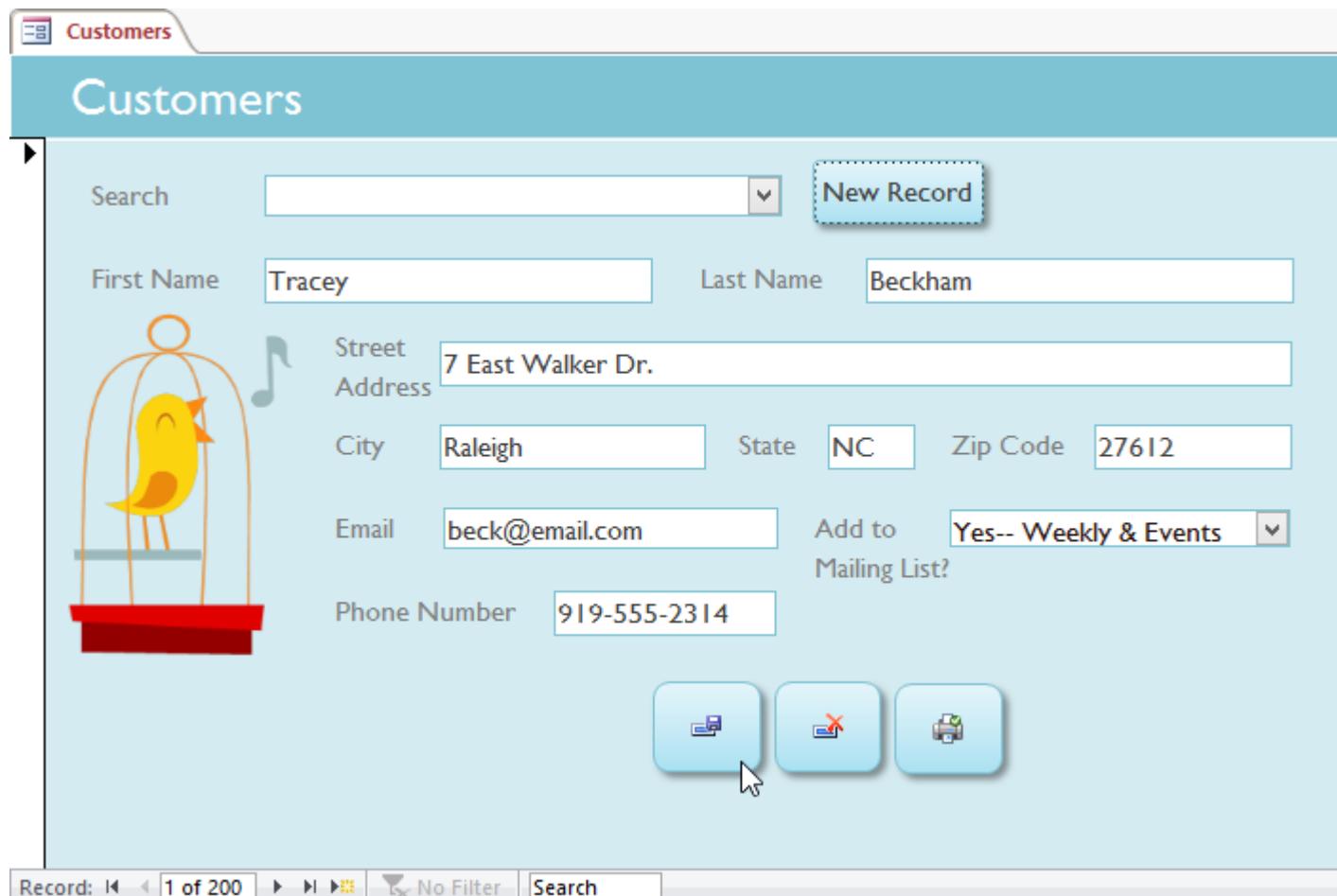
Forms, queries, and reports

Although tables store all of your data, the other three objects—**forms, queries, and reports**—offer you ways to work with it. Each of these objects interacts with the **records** stored in your database's tables.

Forms

Forms are used for **entering, modifying, and viewing** records. You likely have had to fill out forms on many occasions, like when visiting a doctor's office, applying for a job, or registering

for school. The reason forms are used so often is that they're an easy way to guide people toward entering data correctly. When you enter information into a form in Access, the data goes exactly where the database designer wants it to go: in one or more related tables.



The screenshot shows an Access form titled "Customers" with a teal header. The form contains several input fields and a "New Record" button. The data entered is as follows:

Field	Value
Search	[Dropdown arrow]
First Name	Tracey
Last Name	Beckham
Street Address	7 East Walker Dr.
City	Raleigh
State	NC
Zip Code	27612
Email	beck@email.com
Phone Number	919-555-2314
Add to Mailing List?	Yes-- Weekly & Events

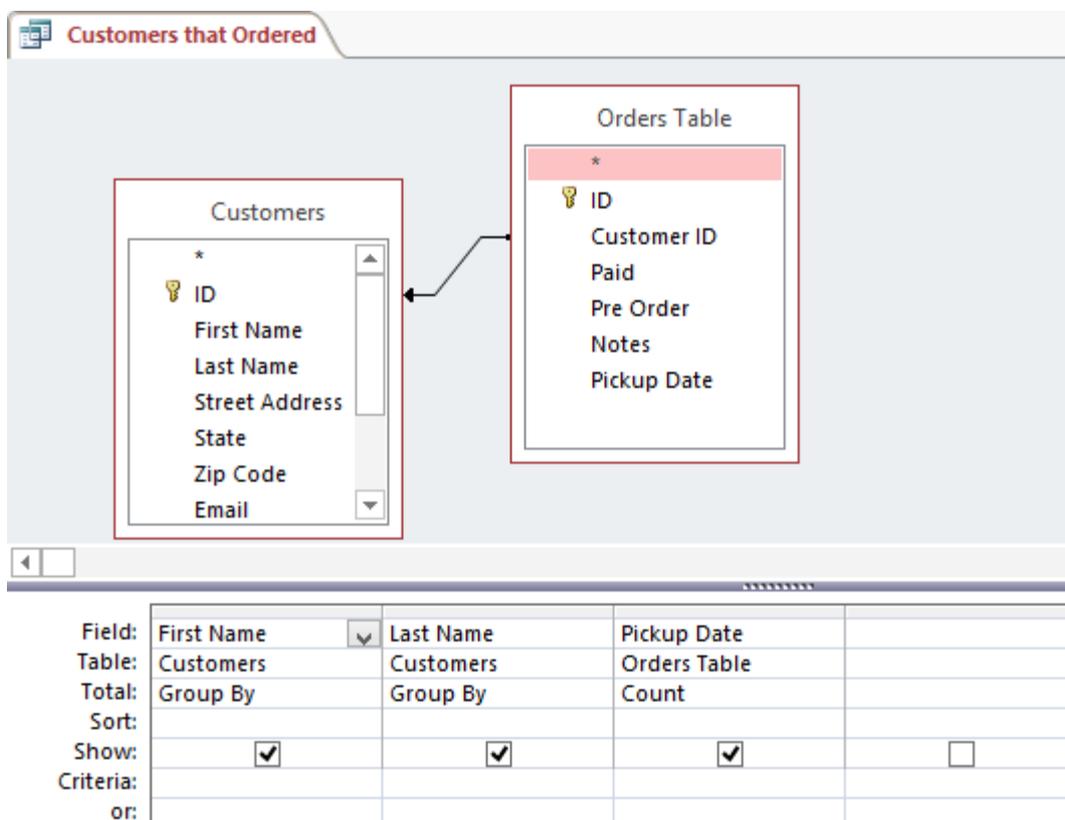
At the bottom of the form, there are three buttons: a blue button with a document icon, a blue button with a red 'X' icon, and a blue button with a printer icon. A mouse cursor is pointing at the first button. The status bar at the bottom shows "Record: 1 of 200", "No Filter", and a "Search" field.

Forms make entering data easier. Working with extensive tables can be confusing, and when you have connected tables you might need to work with more than one at a time to enter a set of data. However, with forms it's possible to enter data into multiple tables at once, all in one place. Database designers can even set restrictions on individual form components to ensure all of the needed data is entered in the correct format. All in all, forms help keep data consistent and organized, which is essential for an accurate and powerful database.

Queries

Queries are a way of **searching** for and **compiling** data from one or more tables. Running a query is like asking a detailed **question** of your database. When you build a query in Access, you are **defining specific search conditions** to find exactly the data you want.

Queries are far more powerful than the simple searches you might carry out within a table. While a **search** would be able to help you find the name of one customer at your business, you could run a **query** to find the name and phone number of every customer who's made a purchase within the past week. A well-designed query can give information you might not be able to find just by looking through the data in your tables.



Field:	First Name	Last Name	Pickup Date	
Table:	Customers	Customers	Orders Table	
Total:	Group By	Group By	Count	
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:				
or:				

Reports

Reports offer you the ability to **present your data in print**. If you've ever received a computer printout of a class schedule or

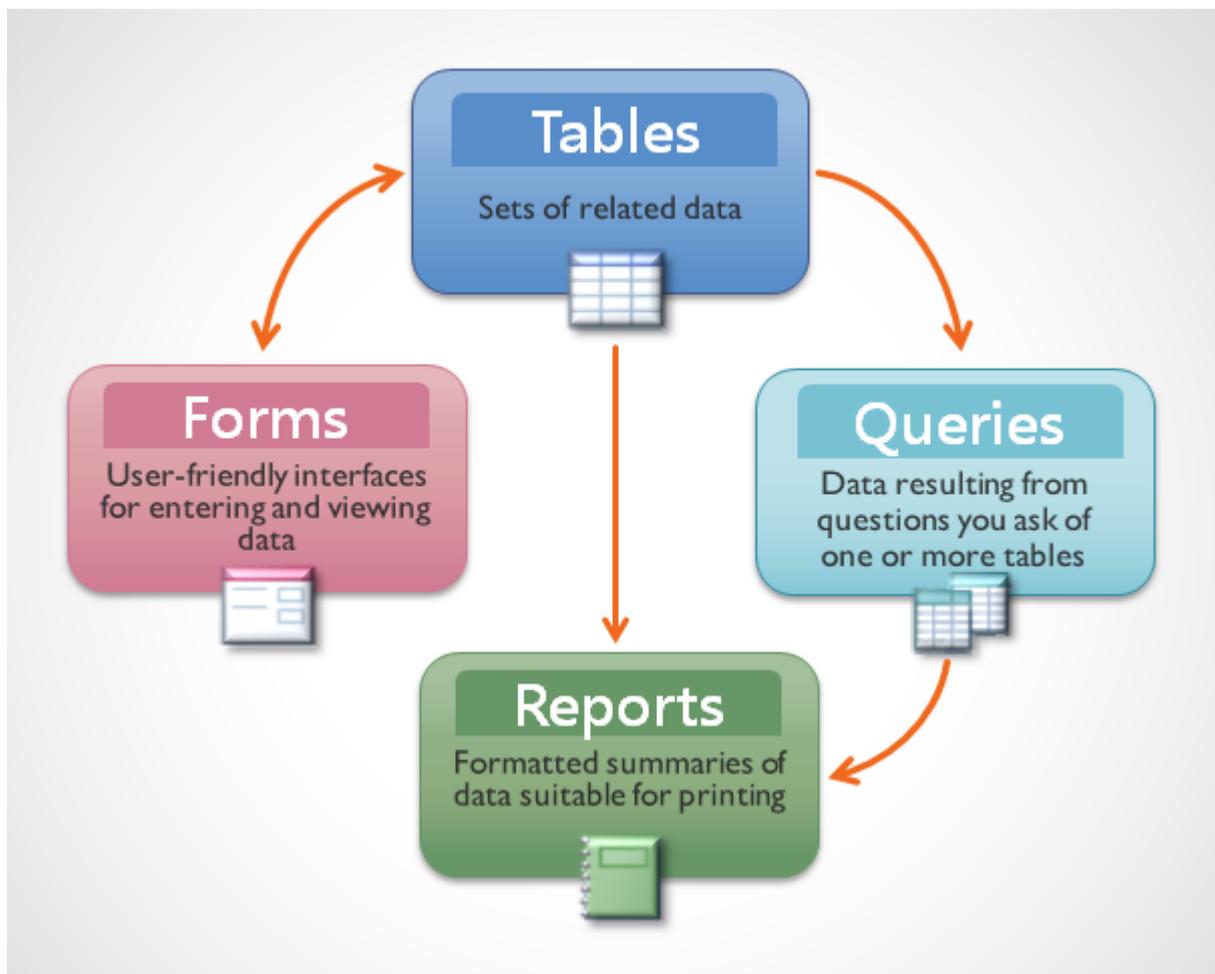
a printed invoice of a purchase, you've seen a database report. Reports are useful because they allow you to present components of your database in an easy-to-read format. You can even customize a report's appearance to make it visually appealing. Access offers you the ability to create a report from any **table** or **query**.

 December Orders

 Orders			
First Name	Last Name	Phone Number	Pickup Date
Andrzej	Wujek	919-555-0450	12/4/2010
Dick	Whitman	919-555-5042	12/4/2010
Xy'nya	Bell	919-555-0758	12/9/2010
Xiaoxi	Zheng	919-555-2786	12/10/2010
Hakim	Auden	919-555-0045	12/14/2010
Zoey	Altman	919-555-6688	12/15/2010
Raphaelle	Duvalier	919-555-1547	12/15/2010
Zoey	Altman	919-555-6688	12/16/2010

Putting it all together

Even if you have a good idea of how each object can be used, it can initially be difficult to understand how they all work together. It helps to remember that they all work with the same data. Every piece of data a **query**, **form**, or **report** uses is stored in one of your database **tables**.



Forms allow you to both **add** data to tables and **view** data that already exists. Reports **present** data from tables and also from queries, which then **search for** and **analyze** data within these same tables.

These relationships sound complicated, but in fact they work together so well and naturally that we often don't even notice when we're using connected database objects. Have you ever used an electronic card catalog to search for a book at the library? Chances are, you entered your search in something that looks like this:

Search the library catalog. Fill in at least one field. The more words you search for, the smaller and more refined your results list will be.

Search by:

Title Keyword AND

Author Keyword AND

General Keyword AND

Subject Keyword

Refine your search (optional):
You can refine your search by selecting a limit or sort option.

Limits

Library Branch: Athens Drive Community Library, Cameron Village Regional Library, Cary Public Library, Duraleigh Road Library, East Regional Library

Type of Book: All Audio Books, Downloadable Audio Books, Adult Audio Fiction, Adult Audio Non Fiction, Children's Audio

Sorting
Sort your results by selecting a sort option.
Select...

When you performed your search, you were entering your search terms into a **form** that then created and ran a **query** based on your request. When the query finished searching the database's **tables** for records that matched your search, you were shown a **report** that drew information from the query and the related tables—in this case, a list of books matching your search terms. You could represent the connections between the objects like this:

