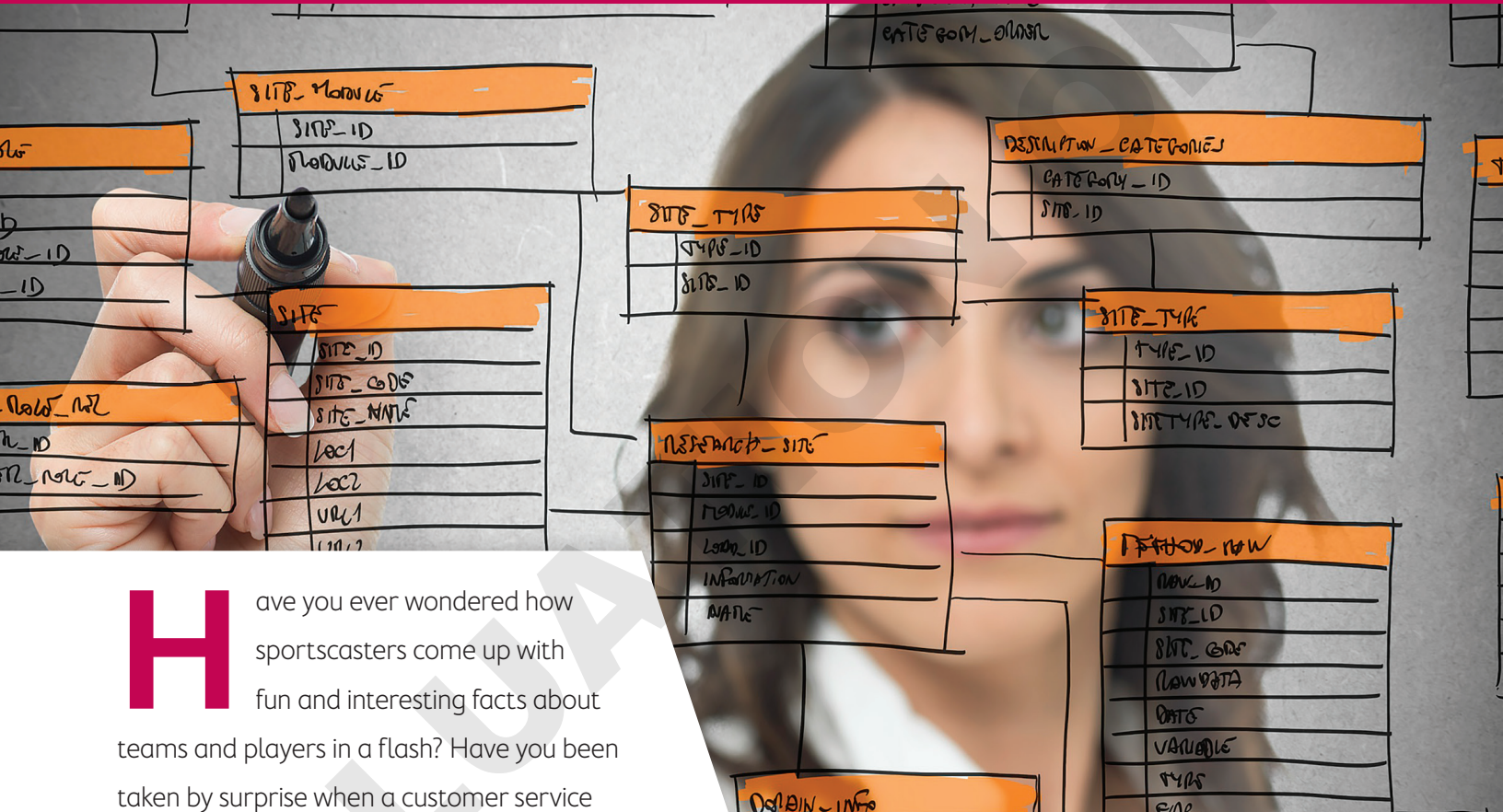


ACCESS

1

Getting Started with Tables



Have you ever wondered how sportscasters come up with fun and interesting facts about teams and players in a flash? Have you been taken by surprise when a customer service agent suddenly begins to recite your name, address, and a detailed purchase history? In most cases, these people have access to a powerful database from which they obtain the information. In this chapter, you will be introduced to database concepts and work with tables, the starting point of all databases.

LEARNING OBJECTIVES

- ▶ Identify database objects and the functions they perform
- ▶ Identify table features
- ▶ Create database tables
- ▶ Identify and choose data types
- ▶ Sort and filter table records
- ▶ Import a data source
- ▶ Establish a relationship between two database tables

Project: Creating a Database

Winchester Web Design is a website development company that specializes in building websites for small businesses. You have been asked to build a database to help the company manage its employee, customer, and sales data. You'll get started by creating a database and building tables and table relationships.

Introducing Databases

It is likely that you routinely interact with **databases**. If you make an online purchase, your order information goes into a database. The database might be used to track your order status, product likes and reviews, past orders, or future promotions. If you post or like something on your Facebook account, that information is maintained in a database. If you search for or store a telephone number, that information is likely kept in a database. It is quite possible you have been using databases without even knowing it! Here, you will be introduced to what a database is and gain a better understanding of related terms, explore a sample database, and, finally, create your own!

While there are many definitions of a database, you can think of a database as an organized collection of related **data** files or tables. For example, a company might organize its information by both customers (external to the business) and employees (internal to the business). While the data relate to the same business, the types of data provided for customers and employees will likely differ.



Databases are the epicenter of our digital world.

Types of Databases


Large organizations typically use large custom-designed databases specifically for that company or industry. When you make travel plans, you are using a database that is specific to the airline industry. It contains **real-time data**, meaning that if there is only one seat left on a plane, whoever selects and pays for the seat first gets the reservation. If you are a small-business owner, you may use predesigned database software such as Microsoft Access to track information about your customers, products, and employees. Access provides the tools needed to let small organizations create, use, and maintain databases.

Open and Save an Access Database

Each time you start Access, the Backstage view displays options for opening an existing file, creating a new blank database, or selecting from a number of prebuilt templates. If you're creating a new database, Access will immediately prompt you to save the file in your desired storage location. You must save your file first because the database will constantly update data as it is entered or edited.

DEVELOP YOUR SKILLS: A1-D1

In this exercise, you will open an existing Access database and save it with a new name.

1. Start Microsoft Access.
2. Browse through the list of templates and then choose **Open Other Files** near the upper-left side of the window.
3. Click the **Browse**  button, navigate to your **Access Chapter 1** folder, and double-click the **A1-D1-WinDesign** database file.
The database opens with the database objects shown in the Navigation pane on the left.
4. Click **Enable Content** if the Security Warning bar displays.
The Security Warning appears whenever a database file is opened for the first time. When working with the files that correspond to this text you should always click the Enable Content button that appears. You should never open files unless you know or trust the file sender.
5. Choose **File**→**Save As**.
Notice the Save Database As option is already selected in the File Types task pane to the left. This allows users to save the entire contents of a database, including any objects, relationships, and settings.
6. Click **Save As** to accept Access Database as the file type.
7. Replace the **1** at the end of the filename with **Rev** to make it **A1-D1-WinDesignRev** and then click the **Save** button.
The database is saved as a Microsoft Access Database file type. This format saves databases as Access 2007–2019 files with the file extension of .accdb.
8. Click **Enable Content** when the Security Warning bar displays again.
Not only did you save the database with a new name, which creates another file, but you also closed the original database and opened the new one, so the Security Warning appears again.
9. Keep Access open, as you will continue to use the database to explore the Access environment.

Note!

Always leave the database file open at the end of an exercise unless instructed to close it.

Database Objects and the Access Window

The Access window includes the Ribbon, Navigation pane, and work area. The **Navigation pane** appears along the left side of the window and displays the database objects. A **database object** is a structure used to either store or retrieve data, and the four Access objects are **tables, forms, queries, and reports**. You can open and use database objects from the Navigation pane; you can also create new database objects using commands on the Ribbon along the top of the window. Whether you use the Ribbon to create a new object or double-click an existing object from within the Navigation pane, the object will open in the **work area**, where you create and modify database objects.

DATABASE OBJECT TYPES

Access Object	What It Does
Table	Tables contain the database's data, and they let you enter, edit, delete, or view records in a row and column layout that is similar to that used in an Excel worksheet.
Form	Forms are used to view, edit, delete, and add data to a table one record at a time.
Query	Queries are used to search for specific table records using criteria and to sort and perform calculations on the results.
Report	Reports are printable database objects that can display, group, and summarize data from tables and/or queries.



View the video “Working with Access Objects.”

DEVELOP YOUR SKILLS: A1-D2


In this exercise, you will open and view the four Access object types.

1. Take a moment to explore the Access window, noticing the various tables, forms, queries, and reports in the Navigation pane.
2. Double-click the **Customers** table from within the Navigation pane to open the table in the work area.

The table opens in **Datasheet View** by default, which appears similar to a worksheet with columns and rows. Datasheet View lets you view, add, and edit table records. One benefit of Datasheet View is it lets you see more than one record at a time.

3. Click in the first empty **Cust ID** cell at the bottom of the CustID column.
4. Type **AdamsA** and tap **Tab** to complete the entry and move the insertion point to the next field.

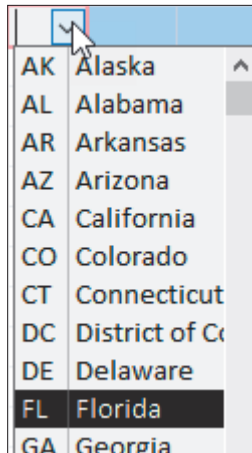
Notice the pencil icon highlighted in yellow. This indicates the current record is active and being created or edited.

+	ThibeauxP	Thibeaux	Pierre
+	WinklerS	Winkler	Samuel
 +	AdamsA		
*			

Cust ID is known as a **primary key field** in this table, so each Cust ID must be unique.

5. Type **Adams** in the Last Name field and tap **Tab**.

6. Enter **Anthony** as the first name, **23 Pine St** as the street address, and **Bradenton** as the city.
7. Click the drop-down **menu** button ▼ in the ST field and choose **FL** from the list of states.



The ST field is an example that utilizes field properties to make data entry easy and accurate.

8. Complete the record as follows, making sure to tap **Tab** after entering the information.

Tapping **Tab** after entering data completes the record, saving it in the database. As you enter the telephone number, Access will automatically format the entry for you.

- ZIP: **34210**
- Telephone: **(941) 555-3648**
- Email: **AAdams@email.com**
- Notes: **Call for delivery.**

9. Choose **Home**→**Views**→**View menu** button ▼ and then choose **Design View** .

Each object type can be created or edited using **Design View**. Tables Design View is where fields can be added, removed, or edited and field properties can be set.

10. Click the **View menu** button ▼ and choose **Datasheet View** .

The Anthony Adams record is now the second record in the table. It moved up because the records are sorted in ascending order by the data in the Cust ID field.

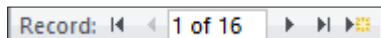
Explore a Form

Now you will explore a form that is based on the Customers table. Forms help facilitate effective data entry by displaying one record at a time.

11. Double-click **Customers Form** in the Forms section of the Navigation pane.

The form displays all fields from the Customers table, but only one record is visible.

12. Locate the Record bar at the bottom of the form.



13. Click the **Next Record**  button to view the Anthony Adams record you just entered.




14. Click in the **Notes** box and add the phrase **after 10:00** to the end of the note (that is, "Call for Delivery after 10:00").

15. Click the **Next Record**  button again to complete the edit.

This edit has now been saved in the Customers table.



Explore a Query

Now you will explore a query that is based on the Customers table. Queries choose specific database records using criteria that you specify.

16. Double-click **Customers Query** in the Queries section of the Navigation pane.
The query results look like a table displayed in Datasheet View, but the query displays only some of the fields from the underlying Customers table and records where the City is equal to Bradenton.
17. Click the **View menu** button  on the Ribbon and choose **Design View** .
18. Choose **Query Tools**→**Design**→**Results**→**Run**  to run the query and display only the Bradenton results.

Explore a Report

Now you will explore a report that uses multiple tables, including the Customers table.

19. Double-click **Invoice Details Report** in the Reports section.
Take a moment to scroll through and observe the report.
20. Switch to **Design View** .
21. Switch to **Report View** , which is great for viewing reports.
22. Follow these steps to display and then close an object:



23. **A** Display the Invoice report by selecting the tab at the far right.
The object type is indicated on each tab by the icon on the left of the tab.
24. **B** Click the **Close Object** button at the far right to close the object.
23. Close the three open objects that remain.
24. Choose **File**→**Close** to close the database.

Introducing Tables

A table is the starting point for entering, finding, and reporting useful information located in your database. A database can have separate tables, each tracking different types of data. A business might use a table to keep track of customer billing or employee contact information.

Table Features

Data are meaningful units of information such as names, numbers, dates, and descriptions organized for reference or analysis. The data stored in the Winchester Web Design database might include customer first and last names, business names, telephone numbers, and other important information.

A **field** is the smallest meaningful unit of information about one person, place, or item. Individually, each field represents a piece of data. Together the fields provide information. In most databases fields are displayed in columns.

A **record** is a collection of related fields about a person, place, or item, such as a single customer or employee. A collection of related records makes up a table. In most databases records are displayed in rows.

CustID	Last Name	First Name	Street Address	City	ST	ZIP	Telephone
AbramsJ	Abrams	John	1210 West Pier Wa	Palmetto	FL	34620	(941) 555-9902
AndersM	Anders	Mark	205 Montana St	Bradenton	FL	34211	(941) 555-2309
BlaserH	Blaser	Helen	600 Fowler	Tampa	FL	33802	(941) 555-1991
DavisP	Davis	Peter	65 Terracotta Way	Sarasota	FL	34024	(941) 555-1792
FleetwoodC	Fleetwood	Candace	92 Highland St	Sarasota	FL	34023	(941) 555-9256
HassanA	Hassan	Ahmed	2301 Proctor Rd	Sarasota	FL	34048	(941) 555-0809

CustID field and BlaserH record in Customers table

Field Data Types

If you have ever filled out an online form, you might have seen instant formatting of some fields. When typing in currency values, the dollar sign and decimal point may appear automatically, and when entering a date, the slashes between month, day, and year spontaneously appear. This can be accomplished by assigning a data type to the field. A data type sets the characteristics of a particular field, identifying the type of values it may hold, such as alphanumeric text or numbers, dates, yes/no values, or even a hyperlink.

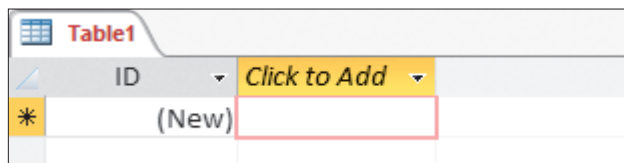
Primary Key Fields

Almost every database table should have a primary key field. A primary key is a unique identifier for each record in the table. Examples of field data that would make good primary keys are Social Security numbers, student IDs, and email addresses. Using a student ID as a primary key ensures that each student is uniquely identified in a student database table. Two students may have identical names, but they will never have identical student ID numbers.

☰ Table Tools → Design → Tools → Primary Key 

Creating a Table in a New Database


Instead of using a database that someone else has prepared, you can design your own using a blank database template in Access. Tables are the starting point for databases, and this shows up when a new blank database is first created. The new table has a single primary key field as a starting point for the database.



The starting point in a blank database

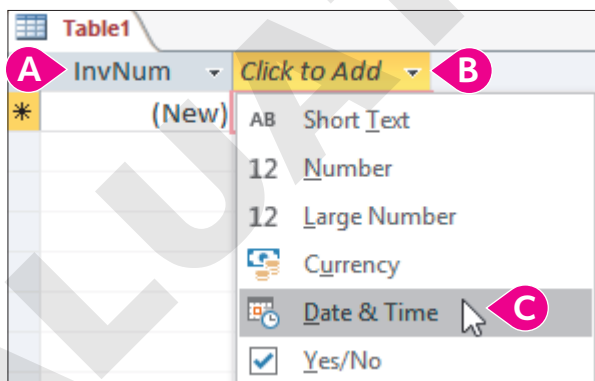
DEVELOP YOUR SKILLS: A1-D3

In this exercise, you will create a new blank database and add an Invoices table in Datasheet View.

1. Choose **File**→**New**→**Blank Database**.
2. Click **Browse Folders**  and navigate to your **Access Chapter 1** folder.
3. In the File Name box at the bottom of the window, enter **A1-D3-Datasheet** as the filename and then click **OK**.

The browsing window closes. Your new database file is now ready for creation in your chosen location using the filename you entered.

4. Click the **Create** button, and a new table will appear.
5. Follow these steps to change the name of the ID field and set the data type for a second field:



- A Double-click the **ID** field name and type **InvNum** as the new name. This will be the primary key field.
- B Tap **Tab** to go to the second column and, if necessary, choose **Click to Add** to display the data type list.
- C Choose **Date & Time**.

Once the data type is selected, the heading for the new field becomes Field1.

6. Replace *Field1* with the name **InvDate** and tap **Tab** to move to a new field.
Your table currently has a primary key field and one Date/Time field.
7. Choose **Short Text** as the data type for the third field and change the field name to: **EmpID**
8. Tap **Tab**, choose **Short Text** for the fourth field data type, and change the field name to: **CustID**
Your simple table with four fields is now set up and ready for data to be entered.
9. Click in the empty **InvDate** field directly below the InvDate header you just created (you might have to click twice) and type: **12/15/2019**
10. Tap **Tab** and type **JFW** as the EmpID.
11. Tap **Tab** and type **SmithW** as the CustID.
12. Enter the data for the three additional records shown.
As you enter the records notice that the InvNum primary key field is automatically numbered because it has an AutoNumber property set.

Note!

You cannot enter data into a field that has an AutoNumber property set. Tap **Tab** or use your mouse to select the next field. Once you type data into the next field the AutoNumber field will automatically populate with the next available number in sequence.

InvNum	InvDate	EmpID	CustID
1	12/15/2019	JFW	SmithW
2	12/2/2019	MJW	SantosE
3	1/1/2019	JMM	SantosE
4	11/30/2019	JMM	SmithW

13. Choose **File**→**Save** or click the **Save**  button on the Quick Access toolbar and save the table with the name: **Invoices**
14. **Close**  the table.

Creating Tables in Design View

You may find it easier to create a new table in Design View than Datasheet View because Design View offers a straightforward layout and intuitive options for entering field names, setting data types, adding field **descriptions**, and setting field **properties**.

 Create→Tables→Table 

Field Properties

Each field data type has numerous properties that can be set to assist with data entry, formatting of displayed data, and other useful functions. Some properties contain drop-down menus and built-in wizards to help guide the user in setting the property.

Properties are set while working in Design View by using the Field Properties Pane at the bottom of the window.

Tip!

The field properties available are always based on the data type for the selected field. For example, a field set with the Number data type will include the Decimal Places property while fields set as Short Text would not.

Field Name	Data Type	Description (Optional)
CustID	Short Text	
CustLastName	Short Text	
CustFirstName	Short Text	
CustStreetAddress	Short Text	
CustCity	Short Text	
CustState	Short Text	
CustZIP	Short Text	
CustPhone	Short Text	
CustEmail	Hyperlink	
Notes	Long Text	

Field Properties	
General Lookup	
Field Size	15
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Text Align	General



View the video “Exploring Field Properties.”

DEVELOP YOUR SKILLS: A1-D4

In this exercise, you will create a new table using Table Design View. Then you will adjust the width of the table columns.


- Choose **Create**→**Tables**→**Table Design** .
Access opens an empty table in Design View.
- Type **CustID** in the Field Name box and tap **Tab**.
- Tap **Tab** to accept *Short Text* as the Data Type.
- Type **Customer Last Name and First Initial** in the Description field and tap **Tab**.
It's a good idea to use field descriptions when setting up tables to help keep track of the purpose and intent of the fields.
- Click in the **CustID** field and choose **Table Tools**→**Design**→**Tools**→**Primary Key** .
CustID is now a required field, and each record must have a unique customer ID. Notice the key icon next to the *CustID* field name, indicating it is the primary key field.

- Click in the empty box below the CustID field and complete the following fields as shown:

Field Name	Data Type	Description (Optional)
CustID	Short Text	Customer Last Name and First Initial
CustLastName	Short Text	
CustFirstName	Short Text	
CustStreetAddress	Short Text	
CustCity	Short Text	
CustState	Short Text	2 character state abbreviation
CustZip	Short Text	5 digit ZIP code
CustPhone	Short Text	Area code and number
CustEmail	Hyperlink	
Notes	Long Text	Special comments

- Click anywhere in the **CustLastName** field, and the Field Properties for that field will display at the bottom of the window.
- Change the Field Size property to **25** and enter **Last Name** as the Caption property.
*The field will now accept only last names of up to 25 characters in length. The Caption property will make Last Name the label that appears for the field when the table is displayed in **Layout View** and when the table is used in queries, forms, and reports. Good database design requires the actual field names follow certain guidelines such as eliminating spaces within the name. The caption lets you follow good design principles while having more descriptive labels for fields.*
- Change the Field Size and Caption properties for the remaining fields as follows:


Field Name	Field Size	Caption
CustFirstName	25	First Name
CustStreetAddress	25	Street
CustCity	15	City
CustState	2	State
CustZip	5	ZIP
CustPhone	15	Telephone
CustEmail		Email

- Choose **File**→**Save** or click **Save**  on the Quick Access toolbar and save the table as: **Customers**



If you ever forget to save, Access will prompt you to save when you close a table or other object.

Set an Input Mask Property

In the next few steps, you will set an input mask property for the CustPhone field. The input mask will automatically format telephone numbers as they are entered, adding parentheses, (), around the area code and a hyphen, -, between the digits.

- Click anywhere in the **CustPhone** field and then click in the **Input Mask** property box.
- Click the **Input Mask**  button on the right side of the property box to display the Input Mask Wizard.

The Input Mask Wizard has several steps that can be used to fine-tune the mask. However, the default settings will work just fine.

13. Click **Finish** to complete the input mask and apply it to the CustPhone field.
14. Click the **View menu** button , choose **Datasheet View** , and choose **Yes** when asked if you want to save the table.

Notice the CustID field is still listed as CustID because you did not apply a caption in the preceding steps. However, all other fields now display the captions you entered previously.

Enter Records

Notice as you are entering records that the input mask you just created formats the telephone numbers, and the email field is automatically formatted as a hyperlink because of the field type setting you made. Also, feel free to widen the columns slightly by dragging the double-headed arrow that appears between column headings if you need more space to see all the data.

15. Enter the following records.

Be sure to check your data entry for accuracy.

CustID	Last Name	First Name	Street	City	State	ZIP	Telephone	Email	Notes
AndersM	Anders	Mark	205 Pine St	Bradenton	FL	34211	(941) 555-2309	MAnders@email.com	
DavisP	Davis	Peter	65 Maple St	Sarasota	FL	34228	(941) 555-1792	PDavis@email.com	
JeffriesD	Jeffries	Daniel	102 Fern St	Bradenton	FL	34209	(941) 555-6939	DannyJ@email.com	

16. Choose **File**→**Close** to close the database.

Sorting and Filtering Table Data

The primary purpose of any database is to locate and retrieve data quickly and efficiently. Sorting and filtering table records can help accomplish this goal.

When a table is created the records are automatically sorted using the primary key field. This can be changed by applying an ascending or descending sort to other table fields. You can even sort on more than one field, so customers could be sorted by last name and then by first name.

 Home→Sort & Filter→Ascending  or Descending 


Filtering displays a subset of records. For example, in a customer table you may want to view only customer records for customers that live in a specific ZIP code. This is accomplished by applying a filter to the ZIP code field.

 Home→Sort & Filter→Filter 


DEVELOP YOUR SKILLS: A1-D5

In this exercise, you will sort and filter records in a database for a medical clinic named Raritan Clinic East.

1. Open **A1-D5-RCE** from your **Access Chapter 1** folder and save it as: **A1-D5-RCERev**
2. Double-click the **Patients** table in the Navigation pane to open it in Datasheet View.

The records are sorted in ascending order (smallest to largest) on the Patient ID primary key field. Records are always sorted on the primary key field unless a sort is applied to one or more other fields.
3. Click any name in the Last Name column and then choose **Home**→**Sort & Filter**→**Ascending** .

Apply a Filter

4. Double-click the **Raritan Clinic East Doctors** table in the Navigation pane.
5. Click anywhere in the **ZIP** column and click the **Filter**  button.
6. Uncheck the **Select All** box and then check the **34205** box.
7. Click **OK** to apply the filter.

Just two records should now be visible. The remaining records are still in the table but are hidden from view because of the filter.

8. Close both tables and save the changes.

The sort and filter you applied will be active next time the tables are used.

9. Choose **File**→**Close** to close the database.


Importing Data Sources

Organizations frequently have data in text files, Excel worksheets, and other formats that needs to be imported into a database. It's easy to import data into Access using the Import & Link tools. Data is imported into tables that become part of the database. Excel workbooks are the most common source of imported data.

 External Data→Import & Link→Excel 

DEVELOP YOUR SKILLS: A1-D6

In this exercise, you will import an Excel worksheet into a new table.

1. Open **A1-D6-WinDesign** from your **Access Chapter 1** folder and save it as: **A1-D6-WinDesignRev**
2. From the Ribbon, choose **External Data**→**Import & Link**→**New Data Source**  and then choose **From File**→**Excel**  from the menu.

3. Take a moment to examine the options in the first screen of the Get External Data Wizard.

You will leave the how and where option set to Import the Source Data into a New Table in the Current Database. Notice the data could also be appended (added) to an existing table if desired.

4. Click the **Browse** button, navigate to your **Access Chapter 1** folder and choose **A1-D6-WebContacts**, and click **Open**.

5. Click **OK** to start the import and display the second Wizard screen.


6. Check the **First Row Contains Column Headings** box and click **Next** to specify the Excel column headings as the field names in the new table.

The next Wizard screens let you adjust various settings, including field names and data types. In the next step you will change the data type for the email field, changing it to a hyperlink.

7. Click in the **Email** column and click the **Data Type menu** button .

8. Choose **Hyperlink** and click **Next**.

The new Email field hyperlink formatting won't show up until the import is complete.

9. Click **Next** again to let Access add a primary key field with autonumbering.
 10. Name the table **Web Contacts** and click **Finish**.
 11. Choose **Close** on the final Wizard screen without checking the Save Import Steps box.
The Web Contacts table appears at the bottom of the Tables list in the Navigation pane.
 12. Double-click the **Web Contacts** table to open it in Datasheet View.
Notice the hyperlink format is applied to the Email field.
 13. Adjust the column widths to fit the widest entries in each column by either dragging the column head borders or autofitting the columns by double-clicking between two column heads.
 14. Click **Save**  on the Quick Access toolbar and close any open tables.
-

Relational Databases

Early database programs stored data in one large, flat file similar to a worksheet. If a salesperson sold merchandise and the same product was sold many times, these databases required the salesperson to enter the same product description and price for every transaction. Such repetitive data entry is time-consuming and bound to cause data errors and inconsistencies.

Relational databases like Access link tables using primary key fields. A good example is linking a Salesperson table with a Sales Invoices table. One salesperson might be linked to hundreds of sales invoices for which that person received commissions. Once a relationship between the Salesperson and Sales Invoices tables is created, all that's needed to associate an invoice with a salesperson is to choose the correct salesperson when creating the invoice. This type of relationship is called a one-to-many relationship because one salesperson is responsible for many invoices. The other types of database relationships are one-to-one and many-to-many, although they are not frequently used.

 Database Tools → Relationships → Relationships 

Referential Integrity



Referential integrity is an option that can be chosen when creating a relationship between tables. It is a set of rules that prevents changes from being made to fields or records that are related to other fields or records. For example, if referential integrity were in effect, then a salesperson could not be removed from a database that has invoices assigned to that salesperson. Referential integrity would require all the invoices either be removed (not a good idea) or associated with a different salesperson before the original salesperson's record could be deleted. Referential integrity also requires the data types of related fields to be the same or compatible.

Data Normalization

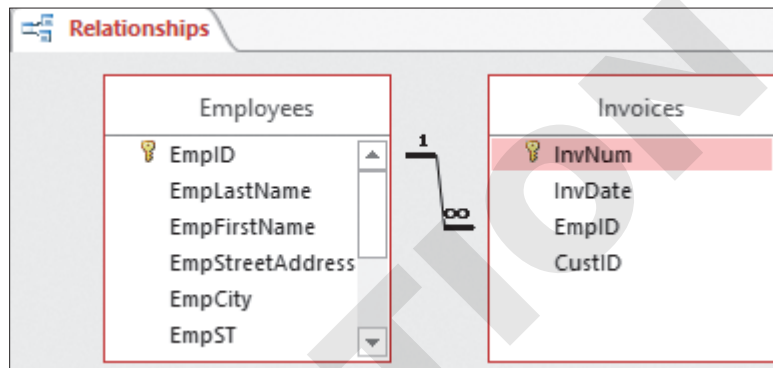
A properly designed database organizes tables and fields into their smallest usable units and then links them using relationships. This is known as normalization. Normalization eliminates data duplication, decreases data entry errors and inconsistencies, reduces file size, and streamlines the search for necessary information. An example of reducing fields to their smallest usable units would be to use separate fields for first name and last name rather than a single name field. If a single name field were used, then the database could never be searched or sorted by just last name or first name.


DEVELOP YOUR SKILLS: A1-D7

In this exercise, you will open the Relationships window, add tables, create a one-to-many relationship between the Invoices table and the Employees table, and set referential integrity for the relationship.

1. Choose **Database Tools**→**Relationships**→**Relationships** .
2. Click the **Show Table**  button.
3. Add the **Employees** and **Invoices** tables to the Relationships window by double-clicking them from the list.
4. Close the Show Table box.

The one-to-many relationship between the EmpID fields is automatically created because it is a primary key in the Employees table and a foreign (or secondary) key in the Invoices table. The line connecting the tables is called a join line. There's a 1 on the Employees side of the join line because EmpID is the primary key in that table. EmpID is a foreign key in the Invoices table, so it has an infinity symbol on that side of the join line. Each employee can have an unlimited number of invoices associated with them.



5. Click **Close**  in the Relationships group on the Ribbon and choose **Yes** to save the relationship.
6. Choose **File**→**Close** to close the database and then close Access.

Self-Assessment





Check your knowledge of this chapter's key concepts and skills using the Self-Assessment in your ebook or online (eLab course or Student Resource Center).

Reinforce Your Skills

REINFORCE YOUR SKILLS: A1-R1

Create a Table in Datasheet View

In this exercise, you will create a new database and a table using Datasheet View.

1. Start Access and choose **Blank Database** from the template list.
2. Click the **Browse Folders**  button and save the database to your **Access Chapter 1** folder as: **A1-R1-K4C**
3. Click the **Create** button to start a new database.
4. Double-click the **ID** heading and change the text to: **StID**
This will be the primary key field with autonumbering, so your records will automatically get numbered.
5. Tap **[Tab]**, choose **Short Text** as the data type, and change the heading from *Field1* to: **StLName**
6. Add the following as fields with the Short Text data type: **StFName**, **StAdd**, **StCity**, **StST**, **StZIP**, **StPhone**, and **StAvail**
7. Choose **File**→**Save** or click **Save**  on the Quick Access toolbar and save your table as: **Staff**
8. Click the first empty cell in the **StLName** field and enter the following records using these guidelines:
 - Use **[Tab]** to complete entries.
 - Enter hyphens in the phone field, as the field is not formatted with an Input Mask.
 - Widen the columns as necessary.
 - Strive for 100% accuracy when entering data, including spaces between characters and uppercase and lowercase letters.



StID	StLName	StFName	StAdd	StCity	StST	StZIP	StPhone	StAvail
1	Bryant	Matthew	12 Macintosh St	Sarasota	FL	34022	941-555-7523	Thursday
2	Earle	Kevin	77 Kingfisher Ct	Sarasota	FL	34024	941-555-1368	Monday




9. Choose **File**→**Close** to close the database.

REINFORCE YOUR SKILLS: A1-R2



Create a Table in Design View

In this exercise, you will create a new table using Table Design View. Then you will adjust the width of the table columns.

1. Choose **File**→**New** and then choose **Blank Database** from the template list.
2. Click the **Browse Folders**  button and navigate to your **Access Chapter 1** folder. Name the database file: **A1-R2-K4C**
3. Click the **Create** button and then switch to **Design View** .
4. Save the table with the name **Children**, and the design grid will appear.

- Replace the field name *ID* with **ChID** and tap .
- Notice the key icon to the left of the Field Name indicating this is a primary key field.
- Change the Data Type to **Short Text** and tap .
- Type **Last Name and First Initial** and tap  to complete the description.
- Enter the remaining fields using the data types and descriptions shown:

Field Name	Data Type	Description (Optional)
ChLName	Short Text	
ChFName	Short Text	
ChAdd	Short Text	
ChCity	Short Text	
ChST	Short Text	2-char abbreviation
ChZIP	Short Text	5-digit ZIP code
ChPhone	Short Text	Area code & number
ChBday	Date/Time	

- Click anywhere in the **ChPhone** field and then click in the **Input Mask** property box.
- Click the **Input Mask**  button on the right side of the Input Mask property box and choose **Yes** if asked to save the table.
- Click **Finish** to accept the Phone Number input mask and apply it to the ChPhone field.
- Switch to **Datasheet View** , saving the table if prompted to do so.
- Enter these records, adjusting the column widths as necessary:



ChID	ChLName	ChFName	ChAdd	ChCity	ChST	ChZIP	ChPhone	ChBday
CregerK	Creger	Kurt	503 Hillview St	Sarasota	FL	34022	(941) 555-0245	10/12/2012
LangfordJ	Langford	James	43 Wisteria Ct	Bradenton	FL	34209	(941) 555-1098	8/13/2010

- Choose **File**→**Close** to close the database, saving the changes if prompted.

REINFORCE YOUR SKILLS: A1-R3

Create, Import, and Sort Tables and Establish Relationships


The staff director of Kids for Change would like you to add two new tables to the database: one that stores various community activities and one that stores parent volunteers. You'll create one of these tables and import the other.

- Open **A1-R3-K4C** from your **Access Chapter 1** folder and save it as: **A1-R3-K4CRev**
The first thing you'll do is import a worksheet into a table, which will then be linked with other tables through relationships.
- Choose **External Data**→**Import & Link**→**New Data Source** .
- From the menu that appears, choose **From File**→**Excel** .
- Click the **Browse** button on the first Wizard screen and navigate to your **Access Chapter 1** folder.
- Choose **A1-R3-ActivityParticipation** and click **Open**.
- Click **OK** to import the worksheet into a new table and display the next Wizard screen.
- Click **Next** again to choose **ActivityParticipation** as the worksheet to use.




8. Check the **First Row Contains Column Headings** box and click **Next** to specify the Excel column headings as the field names in the new table.
9. Click **Next** again to accept the data type of the two fields as Short Text.
10. Click **Next** again to let Access add a primary key field.
11. Click **Finish** to accept *ActivityParticipation* as the table name and then click **Close** to complete the import.

ActivityParticipation should now be in the table list.

Sort the Imported Worksheet

12. Double-click the **ActivityParticipation** table to open it in Datasheet View.
Notice the table is sorted in ascending order by Activity ID.
13. Click anywhere in the **Child ID** column and choose **Home**→**Sort & Filter**→**Ascending** .
The records are now sorted by Child ID to easily see all the activities each child has participated in.
14. Close the table and save the changes.

Create Relationships

15. Choose **Database Tools**→**Relationships**→**Relationships** .
Notice there is currently a relationship between the Donors and Donations tables.
16. Click the **Show Table**  button.
17. Add the **Children**, **ActivityParticipation**, and **Activities** tables and then close the Show Table box.
18. Drag the **Child ID** primary key field from the Children table and drop it on the ChildID field in the Activity Participation table.
Make sure ChildID appears in both the Table/Query and Related Table/Query lists.
19. Check the **Enforce Referential Integrity** box and then click the **Create** button to complete the relationship.
20. Drag the **ActID** field from the Activities table and drop it on the ActID field in the **ActivityParticipation** table.
21. Choose to **Enforce Referential Integrity** and then click **Create**.
These relationships will now allow a database user to determine all the activities a particular child has participated in and to view the details of those activities.
22. Click the **Close**  button above the relationships and choose **Yes** to save the relationships.

Add a Table in Design View

23. Choose **Create**→**Tables**→**Table** .
24. Choose **Home**→**Views**→**Design View**  and save the table as: **Volunteers**

25. Follow these guidelines to set up the table and enter a record:

- Use the field names provided in the image.
- Let VolID be the primary key field with autonumbering.
- Set the data type of all fields (except the primary key field) to **Short Text**.
- Enter the record shown here, including the hyphens in the phone number:

VolID	VolLName	VolFName	VolStreet	VolCity	VolST	VolZIP	VolPhone	AvailDay
1	Jones	Stan	892 South St	Sarasota	FL	34024	941-555-8929	Tuesday

26. Choose **File→Close** when you are finished, saving the changes if prompted.

EVALUATION ONLY

Apply Your Skills

APPLY YOUR SKILLS: A1-A1

Create a Database and Tables

In this exercise, you will create a new database with two tables.

1. Create a new database and save it to your **Access Chapter 1** folder as: **A1-A1-SunStateU**
2. Create a new table named **Classes** using these field names, data types, and captions:

Field Name	Data Type	Caption
ClassID	Short Text (Primary Key)	
Department	Short Text	
ClassNumber	Short Text	Class Number
SectionNumber	Short Text	Section Number
RoomNumber	Short Text	Room Number
StartTime	Date/Time	Start Time
EndTime	Date/Time	End Time
CreditHours	Number	Credit Hours

3. Brainstorm and add at least two records to the table and then close the table.
4. Create another new table named **Professors** using these fields and data types and making **ProfID** the primary key field:

Field Name	Data Type
ProfID	Short Text
ProfLastName	Short Text
ProfFirstName	Short Text
ProfDept	Short Text
ProfRank	Short Text

5. Brainstorm and add at least two new records to the table and then close the table.
6. Choose **File**→**Close** to close the database.

APPLY YOUR SKILLS: A1-A2

Import a Table and Establish a Relationship

In this exercise, you will import an Excel worksheet and establish a relationship between the new table and an existing table.

1. Open **A1-A2-Customers** from your **Access Chapter 1** folder and save it as: **A1-A2-CustomersRev**
2. Open the **Customers** table in Datasheet View.
3. Sort the records in **Ascending** order on the **CustZIP** field.

4. Widen all columns to fit the widest entry in the columns.
5. Close the table, saving the changes.

Import a Worksheet

6. Follow these guidelines to import the **A1-A2-Invoices** workbook in your **Access Chapter 1** folder as a table into the open database:
 - Leave all field names and data types as they are in the Wizard.
 - Make **InvNum** the primary key field.
 - Use **Invoices** as the table name.
7. Double-click the **Invoices** table to open it in Datasheet View.
8. Sort the table in **Ascending** order on the **EmpID** field.
9. Close the table, saving the changes.

Establish a Relationship

10. Open the **Relationships** window and create a relationship between the **CustID** fields in the **Customers** and **Invoices** tables, enforcing referential integrity.
11. Close the **Relationships** window and save the changes to the relationship.
12. Choose **File**→**Close** to close the database.

APPLY YOUR SKILLS: A1-A3

Create a Table, Import a Database, and Establish a Relationship

In this exercise, you will create a database to track the courses taught by specific teachers in a nonprofit organization.

1. Create a new database and save it to your **Access Chapter 1** folder as: **A1-A3-Teachers**
2. Follow these guidelines to create the table shown:
 - Use the table name, field names, and data as shown.
 - Set all data types to **Short Text** and make **TeacherID** the primary key field.
 - Enter this data:

TeacherID	TFirstName	TLastName	TStatus
Amack	Alex	Mack	Fulltime
Bsmith	Brian	Smith	Parttime
Jjones	Jack	Jones	Parttime
Twatts	Tonya	Watts	Fulltime

3. Close the table and save it with the name: **Teachers**
4. Import the **A1-A3-Courses** workbook (**Access Chapter 1** folder) using **CourseID** as the primary key field and naming the table: **Courses**
5. Establish a one-to-many relationship between the **TeacherID** fields in the **Teachers** and **Courses** tables and enforce referential integrity.
6. Close and save the **Relationships** window and close the database.

Project Grader

If your class is using eLab (labyrinthelab.com), you may upload your completed Project Grader assignments for automatic grading. You may complete these projects even if your class doesn't use eLab, though you will not be able to upload your work.

PROJECT GRADER: A1-P1

Taylor Games: Create and Import Tables

Taylor Games creates replacement parts for many different games as well as various types of dice. You've been asked to create a database to manage orders and inventory. It would like you to use the data from a spreadsheet that was previously created to manage inventory for various items.

- Download and open your Project Grader starting file.
 - Using eLab: Download **A1_P1_eStart** from the Assignments page. You must start with this file or your work cannot be automatically graded.
 - Not using eLab: Open **A1_P1_Start** from your **Access Chapter 1** folder.
- Create a new table named **Orders** that contains the following fields and criteria:

Field Name	Data Type	Primary Key	Field Size	Caption
Order_ID	AutoNumber	Yes		Order #
Order_Date	Date & Time			Date
SKU	Number		Double	
Item	Short Text			
Quantity	Number			
Cost	Currency			
Total_Cost	Currency			Total Cost

- Import data from an Excel file into a new table using the following guidelines in the Import Wizard:
 - Choose the **A1_P1_Inventory.xlsx** Excel workbook from your **Access Chapter 1** folder.
 - The first row should contain column headings.
 - Leave all Field Options set to the default values.
 - Use **SKU** as the primary key.
 - Import to a table named: **Inventory**
- Sort the Inventory table data in **Ascending** order on the **Quantity** field; then close the table, saving the changes.
- Create a one-to-many relationship between the SKU fields in the Inventory and Orders tables, enforcing referential integrity. Close and save the relationship when you are finished.
- Save your database.
 - Using eLab: Save it to your **Access Chapter 1** folder as **A1_P1_eSubmission** and attach the file to your eLab assignment for grading.
 - Not using eLab: Save it to your **Access Chapter 1** folder as: **A1_P1_Submission**

PROJECT GRADER: A1-P2

WebVision: Design a Database and Create Tables

You are the Senior Sales Rep for WebVision, a startup company providing a unique closed-circuit television service. You've been asked to create an Access database of the most recent orders taken and relate them to the sales reps who made the sales.

- Download and open your Project Grader starting file.
 - Using eLab:* Download **A1_P2_eStart** from the Assignments page. You *must* start with this file or your work cannot be automatically graded.
 - Not using eLab:* Open **A1_P2_Start** from your **Access Chapter 1** folder.

- Create a new table named **Sales Reps** that contains the following fields and criteria:

Field Name	Data Type	Primary Key	Caption
RepID	Short Text	Yes	Rep ID
LastName	Short Text		Last Name
FirstName	Short Text		First Name
SalesTeam	Short Text		Sales Team

- Enter the following data into the Sales Rep table and then close the table, saving the changes, if necessary:

Rep_ID	LastName	FirstName	SalesTeam
S101	Franks	Bernie	North
S102	Edmunds	Sally	Central
S103	Berry	Amy	West
S104	Lifestone	Ben	South

- Import data from an Excel file into a new table using the following guidelines in the Import Wizard:
 - Choose the **A1_P2_Orders.xlsx** Excel workbook from your **Access Chapter 1** folder.
 - The first row should contain column headings.
 - Leave all Field Options set to the default values.
 - Use **OrderID** as the primary key.
 - Import to a table named: **Orders**
- Make the following changes in the Orders table:
 - Set the caption for the OrderID field to: **Order Number**
 - Set the caption for the RepID field to: **Rep ID**
 - Sort the data in the **Date** field in descending order and then close the table, saving the changes if necessary.
- Create a one-to-many relationship between the RepID fields in the Sales Reps and Orders tables, enforcing referential integrity. Close and save the relationship when you are finished.
- Save your database.
 - Using eLab:* Save it to your **Access Chapter 1** folder as **A1_P2_eSubmission** and attach the file to your eLab assignment for grading.
 - Not using eLab:* Save it to your **Access Chapter 1** folder as: **A1_P2_Submission**

Extend Your Skills

These exercises challenge you to think critically and apply your new skills in a real-world setting. 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.

A1-E1 That's the Way I See It

You've volunteered to help a nonprofit organization determine how much recyclable material is being collected by the five recycling centers in the area. You've been tasked with creating a database with contact information for the five centers. You will also visit the five centers, gathering information on the recyclables they accept and the annual number of metric tons of each that they've collected each year over the past three years. The annual tonnage information needs to be in a separate table that is related to the Centers table. Save your completed database as: **A1-E1-Recycle**

A1-E2 Be Your Own Boss

Your boss, the owner of Blue Jean Landscaping, has decided to sponsor the Sarasota Service Guild, a nonprofit organization created to raise money to help adults with disabilities. It needs a database that tracks businesses that donate to the guild and the donations that are made. Create a database with tables and fields to track the businesses and the donations they make. Create a relationship that can be used to relate businesses to the donations it has made over the past five years. Populate your tables with information for two businesses, with each making an annual donation over the past five years. Include relevant information about the businesses, including their names, addresses, and primary contact information. Include the amount and date of the annual donations. Save your completed database as: **A1-E2-BJL**

A1-E3 Demonstrate Proficiency

Stormy BBQ wants to modernize its business. It has hired you to design and create a database for its BBQ restaurant. Use Access to create a database with three tables: one for staff, one for menu items, and one for transactions where each transaction lists the menu items on that transaction including the quantity and price of each item. Relate the menu and transactions tables. Enter enough data to be able to view and modify the tables as needed. Save your completed database as: **A1-E3-StormyBBQ**