

# Access Basics 1: Planning and Building a Table



# Access Basics 1: Planning and Building a Table

## 1.0 hours

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### What is a Database?

The term Database is usually describes a collection of related "data" (information). An electronic database should allow you to store, sort, and retrieve data. You can create simple databases by creating a Word table or an Excel spreadsheet.

For example, here we have simple database of our patients:

MedRec#	First Name	Last Name	Birth Date	Doctor
123-456	Jack	Nimble	06/08/82	Edwards
987-654	Jill	Pail	08/27/75	Lewis
753-951	Mary	Bluebell	12/08/61	Edwards

Here is a simple database of our doctors:

EmpID #	First Name	Last Name	Phone #
999-999	Ken	Edwards	555-1234
888-888	Laura	Lang	555-4567
777-777	Yolanda	Lewis	555-7890

### Why use Microsoft Access?

Microsoft Access is a "relational" database application. Relational means we can link together sets of data, we can **relate** the data. We can keep track of the patients, the doctors and when the patients last saw their doctors, what happened at each visit and so on. Access allows us to *relate* our data, without the repetition that may occur anywhere else.

In an Access database, we can create both of the datasets and link them.

MedRec#	First Name	Last Name	Birth Date	Doctor
123-456	Jack	Nimble	06/08/72	Edwards
987-654	Jill	Pail	08/27/75	Lewis
753-951	Mary	Bluebell	12/08/61	Edwards

EmpID #	First Name	Last Name	Phone#
999-999	Ken	Edwards	555-1234
888-888	Laura	Lang	555-4567
777-777	Yolanda	Lewis	555-7890

In Microsoft Access, data is stored in **Tables**. As data in the Tables change, the rest of the Access database will reflect the newest information (i.e. the Queries, Forms and Reports).

**Queries** show the data in a Table format. A Query can pull from multiple Tables and allow you to limit the records (rows) display by using criteria and showing only the fields (columns) you want. We can find the phone number for Jill's Doctor, and provide Ken with a list of his patients.

**Forms** can be created to provide a "user-friendly" side to your database. They are used to view and enter your data in an interactive formatted structure. Forms are also used to make menus and search windows that turn a simple data collection tool into a more interactive user-friendly application.

**Reports** are created to print out your data in a formatted structure. They allow you to group and organize your data. They can be used to create Form letters and mailing labels. Access works beautifully with Word for mail merges, but the Reports tool allows for the multi-level summaries.

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## **Planning the Database Tables**

The most important part of creating a relational database is **planning**. This can be difficult when you are first learning to use Microsoft Access. Here are some questions that may help:

1. Input - What data do I already have for the database?
2. Output - What information do I want to get out of the database?
3. Process - What do I need to do to get there?

Sometimes it helps to plan the final Reports that you want from your database. For example, we want to have a chart of how many patients attended their appointments. Do we track the 'cancellations' vs. the 'no shows'? What about the late arrivals and the rescheduled? If we want to differentiate, we need to make sure we are going to collect that data. This is why it's so important to plan, to try to predict the "what ifs" that may occur once you have your data collected.

The Tables are the core of your Access database; these structures store the data. Tables are essential to using any of the other Access Tools. When planning your database try to remember the basic design rules for your Tables.

### ***Design Rules***

#### **Organizing Data**

Once you have an idea of the data you would like to collect, you need to decide how many tables you might use to organize the data efficiently. In Excel, we might keep several numbered columns to keep track of things, i.e. Medication1, Medication 2..., but in Access, we should create a second table to track the numbered fields.

#### **No Derived Fields**

By using the relationships between our tables, we can derive missing data. If we are creating a new appointment for a patient, we only need to put in their Medical Record Number (or other unique identifier). The patient's name, phone number, and other information can be derived from the Patient Table.

#### **Data is broken down into Smallest Logical Parts**

Pulling fields together in Access is often simple; pulling them apart usually requires human intervention. Think of this as breaking up the data into its smallest *sort-able* part.

#### **Descriptive Field Names**

It is tempting to use abbreviations when we are creating our data tables, but if the title we use is too vague or too abbreviated, we may not be able to recall why we created that field. DOB – Date of Birth or Department of Babies? SSN – Social Security Number or Shands System Number?

#### **Unique Field Names**

Be sure to differentiate between the field names in each Table. We can have a 'First Name' in our Patient Table and a 'First Name' in our Doctor Table but this can lead to confusion when we try to pull both Tables into one database object. Think 'Pt First Name' and 'Dr First Name'.

#### **No Calculated Fields**

In Microsoft Excel, we can perform our calculations on the same sheet as our data, but a Table in Access is stagnant data, it does not change unless you make it change. Access will let you create calculations in Queries, Forms, and Reports. Newer versions of Access do have a Calculated field type for the table. This will embed a calculation in the record and is not always automatically populated in a data entry form.

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## Unique Records

It is important that each Table has a way to keep records (rows) unique. We can do this by setting one field (column) to be a **Primary Key** field. When a field is set as a Primary Key, Access will not allow any duplication nor blanks. When there is not a unique field in your collected data set, you can use an *AutoNumber*. AutoNumbers are incremented or random fields that are always unique.

## Tables

Tables store data. The Tables are the true 'database' (base of data). These need to be created and properly linked (related) in order to effectively use the other Access tools. Tables are the core of your database; everything else in Access depends on the Tables.

## Vocabulary

**Datapoint** – One Cell with in the data grid

**Field** – One column of a Table common to all the records

**Record** – One row of a Table containing all data about a particular entry

**Table** – One set of related data

**Database** – Structured collection of related Tables

A collection of fields make up a record. A collection of records make up a Table. A collection of Tables make up a database

## Design View

The **Design View** of a Table allows you to create and modify:

- **Field Names** (the column headings)
- **Data Type** – Sets the type of value allowed to be entered into the fields. Short Text allows for up to 255 characters; Date/Time only allow dates and times; Number are fields you plan to use for mathematical calculations. Values such as phone numbers, zip codes, and employee IDs should be left as short text.

Beware, Number fields are automatically created as "long Integers". Change the *Field Size* property to *Single* or *Double* to allow decimal places for fields such as HA1C (6.8) or GPA (3.5).

- **Descriptions**, which will be displayed in the status bar in the Datasheet View of Forms
- And the **Properties** of each field, such as how many characters can be entered (text field size), or how the data is formatted (05/05/22 or May 5, 2022).

	Field Name	Data Type	Description (Optional)
☒	Pt Med Rec #	Short Text	
	Pt First Name	Short Text	
	Pt Last Name	Short Text	
	Pt Birth Date	Date/Time	

Field Properties

General		Lookup	
Field Size	255		
Format			
Input Mask			
Caption			
Default Value			
Validation Rule			
Validation Text			
Required	Yes		
Allow Zero Length	Yes		
Indexed	Yes (No Duplicates)		
Unicode Compression	No		
IME Mode	No Control		
IME Sentence Mode	None		
Text Align	General		

The field description is optional. It helps you describe the field and is also displayed in the status bar when you select this field on a form. Press F1 for help on descriptions.

## Datasheet View

The **Datasheet View** of a Table allows you to create and modify the data within a grid structure based on the settings of the Design View.

VisitID	Med Rec	Visit Date	Vist Time	Length	Reason	Doctor
1	465-710	1/8/2008	11:15 AM	15	Followup	Sidney, Samueson, x801234
2	107-284	1/15/2008	4:00 PM	75	Physical	Sidney, Samueson, x801234
3	828-079	1/26/2008	3:30 PM	30	Nausea	Sidney, Samueson, x801234
4	105-469	1/30/2008	9:15 AM	45	Followup	Sidney, Samueson, x801234
5	154-788	2/6/2008	11:00 AM	30	Sore Throat	Sidney, Samueson, x801234
6	155-612	2/15/2008	12:00 PM	45	Physical	Sidney, Samueson, x801234

## Properties

We will go more in depth with the properties in the Zoom Tables 1 Session.

The properties we will change in this class include:

### SHORT TEXT FIELD

- Field Size: Number of characters allowed in a Short Text field
- Input Mask: A pattern for the data to be entered. Use the ellipsis button (...) at the end of the line to launch the wizard to help create the proper code for this property.

### DATE/TIME FIELD

- Format: How the value is displayed. You can choose a date/time format from the list, or use a combinations of M, D, Y to create your own format. Short Date: M/D/YYYY, you may prefer to include the leading zeros, in which chase you would type MM/DD/YYYY (*Access is not case sensitive*)

General		Lookup
Field Size	255	
Format		
Input Mask		
Caption		
Default Value		
Validation Rule		
Validation Text		
Required	Yes	
Allow Zero Length	Yes	
Indexed	Yes (No Duplicates)	
Unicode Compression	No	
IME Mode	No Control	
IME Sentence Mode	None	
Text Align	General	

Short text allows any alphanumeric characters, up to 255 characters

General		Lookup
Format		
Input Mask		
Caption		
Default Value		
Validation Rule		
Validation Text		
Required	Yes	
Indexed	Yes (No Duplicates)	
IME Mode	No Control	
IME Sentence Mode	None	
Text Align	General	
Show Date Picker	For dates	

Date/Time allows Dates and/or Times only. You don't have to list a time.

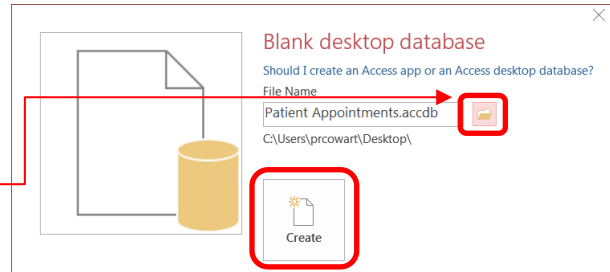
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## Class Exercise

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### Create the Database

1. Open Microsoft Access
2. Choose **Blank Desktop Database** (single click)
3. Click on the yellow folder at the end of the **File Name** box and browse for the desktop
4. Name the File: **Access Basics 1**
5. Click **Create**



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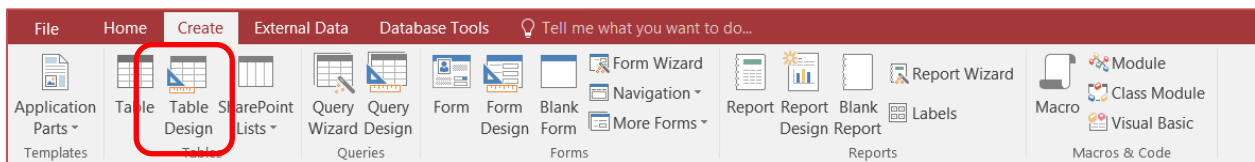
### Explore the Window

1. Close **Table1** with the X or right-clicking on the name of the table, chose **Close**
2. **Explore the Ribbon**
  - **Home** Tab – Clipboard, Sort & Filter, Spell Check, Refresh Data, Format text
  - **Create** Tab – Create a database object: Tables, Queries, Forms, Reports
  - **External Data** Tab – Import and Export data
  - **Database Tools** Tab – Advanced Features of Relationships and Data Analyzers

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### Create the Patients Table

1. Click on the **Create** Tab and choose **Table Design**



2. Type the first Field Name: **Pt Med Rec #**
  - Data Type: **Short Text**, Description: **Patient's Medical Record Number**
3. Enter in the rest of the fields (descriptions not necessary):

Field Name	Data Type	Description (Optional)
Pt Med Rec #	Short Text	Patient's Medical Record Number
Pt First Name	Short Text	
Pt Last Name	Short Text	
Pt Phone #	Short Text	
Pt Birth Date	Date/Time	

4. Set the Pt Med Rec # to be the key
  - Click on the big yellow key on the toolbar, or right-click inside the Pt Med Rec # field
5. Save the Table as **Patients**

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### Entering First Record

1. Turn to the Datasheet View
2. Enter our first Pt Med Rec #: **123-456**
3. Press tab move to the next field

Pt Med Rec #	Pt First	Pt Last	Pt Phone #	Pt Birth Date
123-456	Sam	Franks	3525551234	1/1/1

- Pt First Name: **Sam**
- Pt Last Name: **Franks**
- Pt Phone #: **3525551234** (*all one number*)
- Pt Birth Date: **1/1/1**
  - Access should add in the "200" for 2001, if it did not change, return to the Design view and set the *Data Type* to *Date/Time*. If it does not, return to the Design view and change the field type.

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### Exit the Database

1. Exit the database, Access will probably not ask you to save
  - Access automatically saves the record, but if you changed the column sizes it will ask you to save the Layout.
2. Open Microsoft Access
  - From the File menu, choose your **Access Basics 1** database
  - If necessary, *Enable Content*
3. Open the **Patients** table (double-click) from the navigation pane
  - Sam should still be there!

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### Rearrange Fields

1. In **Design View**, move Pt Birth Date above the Pt Phone #
  - Click on the row heading, the grey box in front of the field name. Then Click/Drag the line above the Pt Phone #
2. In **Datasheet View**, Enter the next record
  - Again, no separators in the phone number

Pt Med Rec #	Pt First	Pt Last	Pt Birth Date	Pt Phone #
<b>789-012</b>	<b>Jacob</b>	<b>Smith</b>	<b>2/2/92</b>	<b>3525554321</b>

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### Adding Fields

1. In **Design View**, Insert a row above Pt Birth Date called **Pt Gender**,
  - Insert Rows from Design Tab, or from the right-click menu
2. Set the new field to be Short Text
3. In **Datasheet View**, enter **Male** (the whole word) for Sam and Jacob



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Enter a "trouble maker" Record

1. In **Datasheet View**, enter the next record

Pt Med Rec #	Pt First	Pt Last	Pt Gender	Pt Birth Date	Pt Phone #
555-555	Jane	Williams	F	March 3, 1983	352-555-5555

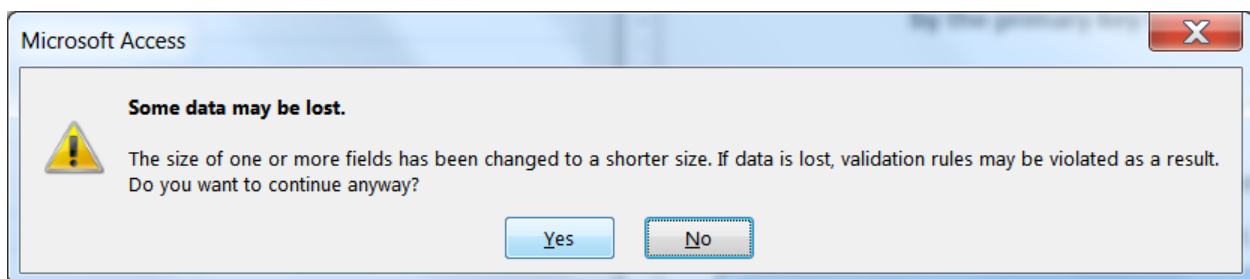
- Enter Pt Gender as just one character
  - Enter Pt Birth Date as March 3, 1983; it should change to 3/3/1983
  - Type in the hyphens for the Pt Phone Number
2. Flip between the Design view and Datasheet View
    - Notice Jane's record moves. This is because by default Access sorts by the primary key field. Since Pt Med Rec # is our key, every time the data is refreshed it will sort the data by the primary key field.

Pt Med Rec #	Pt First Name	Pt Last Name	Pt Gender	Pt Birth Date	Pt Phone #	Click to Add
123-456	Sam	Franks	Male	1/1/2001	3525551234	
555-555	Jane	Williams	F	3/3/1983	352-555-5555	
789-012	Jacob	Smith	Male	2/2/1992	3525554321	
*						

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Modify Field Properties – Field Size

1. In Design View, set **Field Size** property of Gender at the bottom of the window to be 1
2. When you return to the Datasheet View and Save, you will get the following warning message saying data may be lost. We want this to happen, click Yes.



3. Data is lost, our Pt Gender entries should now only read M

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Modify Field Properties – Format

1. In Design View, set the **Format** property for Pt Birth Date to be a Medium Date
  - Notice there is no "field size" for a date field, because it does not matter how many characters you type in, as long as it is a valid date.
  - Like Microsoft Excel, Access recognizes dashes (1-1-2001) and slashes (1/1/2001)

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## Modify Field Properties – Input Mask

1. In Deign View, set an **Input Mask** for the Phone Number
  - Click in the Input Mask Property for Pt Phone #
  - Click the Build button (...) at the end of the line to launch the wizard
  - In the Input Mask Wizard, Phone Number is already selected. Click FINISH.
  - Save and View Results

Pt Med Rec #	Pt First Name	Pt Last Name	Pt Gender	Pt Birth Date	Pt Phone #	Click to Add
123-456	Sam	Franks	M	01-Jan-01	(352) 555-1234	
555-555	Jane	Williams	F	03-Mar-83	352-555-5555	
789-012	Jacob	Smith	M	02-Feb-92	(352) 555-4321	
*						

2. Fix Jane's Phone Number by taking out the extra dash

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## Enter a New Record

1. Enter a new record

Pt Med Rec #	Pt First	Pt Last	Pt Gender	Pt Birth Date	Pt Phone #
527-594	Doris	Jones	F	4/4/74	3525555432

2. Close the Table
3. Open the Patient's Table to view the new sort order, remember it sorts by the primary key

Pt Med Rec #	Pt First Name	Pt Last Name	Pt Gender	Pt Birth Date	Pt Phone #	Click to Add
123-456	Sam	Franks	M	01-Jan-01	(352) 555-1234	
527-594	Doris	Jones	F	04-Apr-74	(352) 555-5432	
555-555	Jane	Williams	F	03-Mar-83	(352) 555-5555	
789-012	Jacob	Smith	M	02-Feb-92	(352) 555-4321	
*						

4. Close the Table

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## Compact and Repair

Access files can grow very quickly, and sometimes become bloated. Compact eliminates unused space that Access set aside and you never used, or from deleted structures. Repair looks for damages and potential data corruption.

1. From the File Tab choose **Info**
  - a. Choose **Compact and Repair**
    - You should do this every time you add a large amount of data, the database crashes, it begins to run slowly, or starts acting "funny".