

CHAPTER 1

DATA VALIDATION

InFocus

WPL_A813

There is a saying in computer circles: garbage in, garbage out. One of your primary concerns with your system should be to ensure that, to the best of your ability, you'll always have accurate and relevant information in the system. The saying above is generally correct when it comes to databases – you won't be able to produce meaningful information from the database if the data that is entered into it in the first place isn't worth a pinch of salt.

That is why in good database software, such as Microsoft Access, there are plenty of little features and facilities that can help to reduce the likelihood of incorrect data entering the system. Access allows you to make changes to the **field properties** of a table.

Properties are attributes that control the way that an object either works or looks. There are several field properties that can be used to check what has been typed and to restrict errors and unwanted data being entered into the table.

Ensuring the accuracy of the data is known as **validation** and is an important aspect of any system design.

In this session you will:

- ✓ learn how to assign default values to a field
- ✓ learn how to enter validation rules for a field
- ✓ learn how to validate numbers
- ✓ learn how to set fields as required
- ✓ learn how to work with validations.

ASSIGNING DEFAULT VALUES



With some fields it's easy to anticipate what data would normally be entered into them. When this occurs you can **assign a default value** that automatically appears in the field whenever a

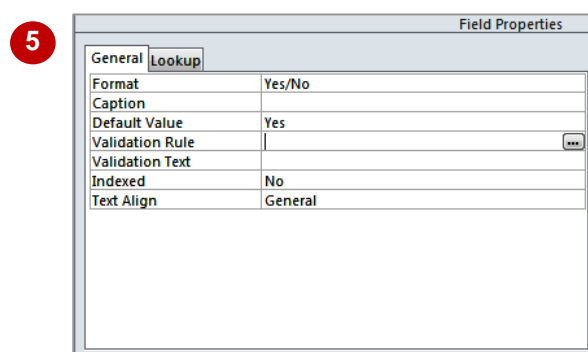
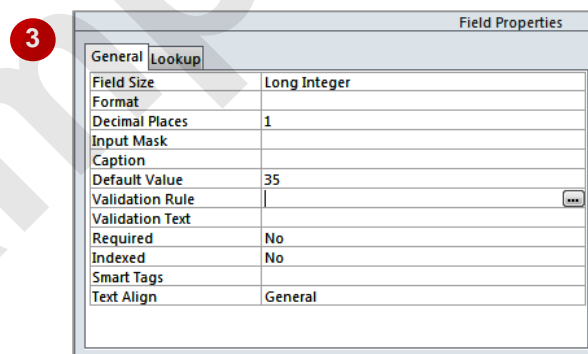
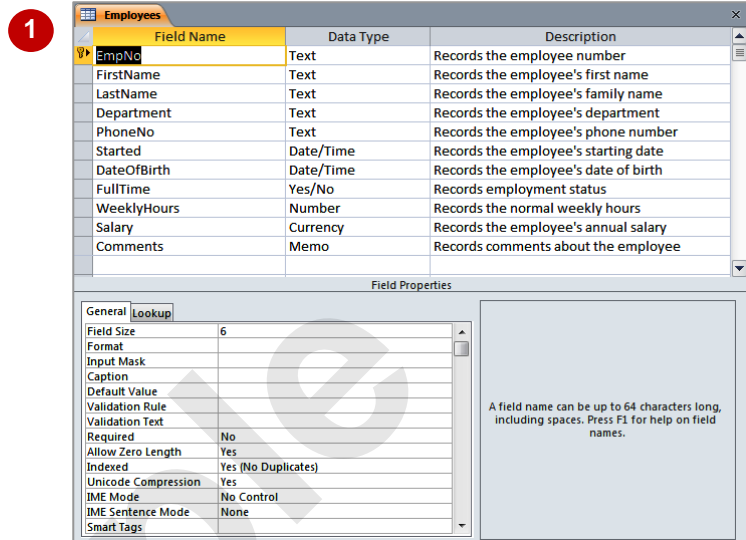
new record is accessed. In our *Employees* table most new employees are full time and work a 35 hour week. These values can be made the default value when new records are created in the table.

Try This Yourself:

Open
File

Before starting this exercise you **MUST** open the file *A813 Data Validation_1.accdb...*

- 1 Right-click on the **Employees** table in the **Navigation** pane, then select **Design View** to see the table in **Design View**
- 2 Click on **WeeklyHours** to display its **Field Properties**
- 3 Click in **Default Value**, type **35** and press **Enter**
35 hours will now be the default value for all new records created in the table...
- 4 Click on the **Fulltime** field in the top part of the window to display its **Field Properties**
- 5 Double-click on **0** in **Default Value**, type **Yes**, then press **Enter**
All new employees will appear as Fulltime as a default...
- 6 Click on **Save**  in the **Quick Access Toolbar** to save the design changes
- 7 Click on **Close**  at the right of the table to close it



For Your Reference...

To **assign default values to fields**:

1. Open the table in **Design View**
2. Click on the desired field
3. Click in the **Default Value** property and type the appropriate value

Handy to Know...

- If you want to show the current date in a date field as a **Default Value**, type the function **Date()** into the **Default Value** property of the field. This will show the system date (that is, the current date) in all new records.

VALIDATION RULES AND TEXT



Validation rules are instructions to Access to tell it what data to accept and what data to reject when the user types something into a field. For example, you can use validation rules to ensure

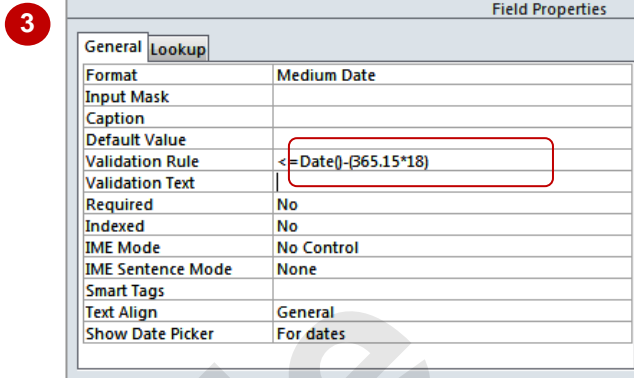
that new employees are older than 18 years, that salaries are between a specific amount, and the like. Rules are generally entered as formulas, which in Access are known as **expressions**.

Try This Yourself:

Same File

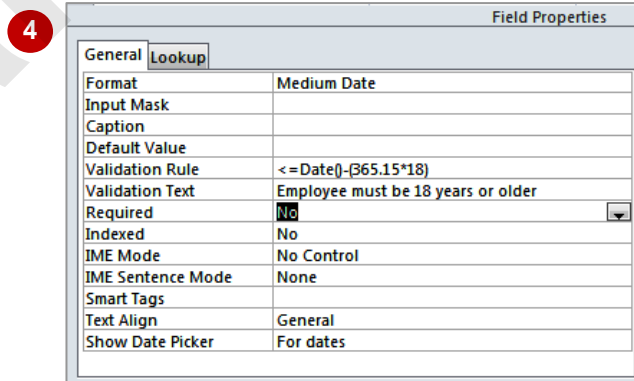
Continue using the previous file with this exercise, or open the file *A813 Data Validation_2.accdb...*

- 1 Right-click on the **Employees** table in the **Navigation** pane and select **Design View**
- 2 Click on **DateOfBirth** to display its **Field Properties**
- 3 Click in **Validation Rule** and type `<=Date()-365.25*18` then press to move to **Validation Text**
- 4 Type **Employee must be 18 years or older** then press
- 5 Click on **Save**  in the **Quick Access Toolbar** to save the design changes
You will now be asked if you wish to test the rule against existing records...
- 6 Click on **[Yes]** to test all of the records
- 7 Click on **Close**  to close the table



In Access, dates are converted to numbers – every day has its own sequential number. The `Date()` function returns the number for the current date. The formula above says that the number for the date entered by the user must be earlier than the number for today less the number for the day 18 years (365.25×18) from today.

For instance, let's say the number for today is 84,356. Eighteen years ago, the number would have been 77,781 (84,356 less 6575). Therefore the number for the date that the user enters must be less than this to ensure the employee's age is 18 or older.



For Your Reference...

To **assign a validation rule** to a **field**:

1. Open the table in **Design View**
2. Click on the field
3. Click in the **Validation Rule** property and type the rule as an expression (formula)

Handy to Know...

- The **Validation Text** appears when the user types a value in the field that doesn't match the expression. In our example above, if the user types a date that the expression calculates makes the employee younger than 18, the text will appear in a box on the screen and the user must correct the date.

VALIDATING NUMBERS



Validation rules for fields are entered into field properties as a formula, known as an expression. **Numbers are usually validated** in terms of a **range** – for example, the number entered by the

user has to be greater than, or less than, or equal to a specific value. These expressions are usually entered using **operators** that represent greater than and less than.

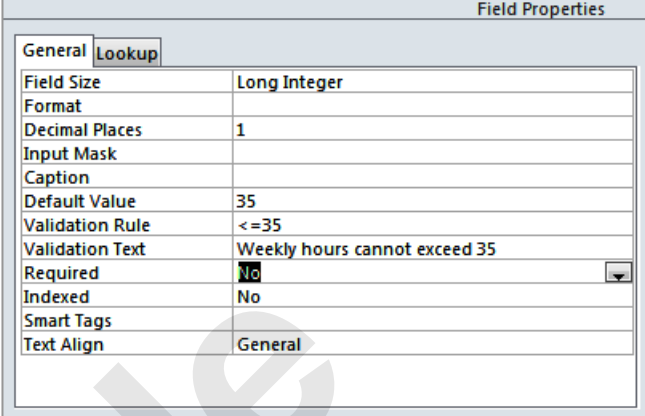
Try This Yourself:

Same File

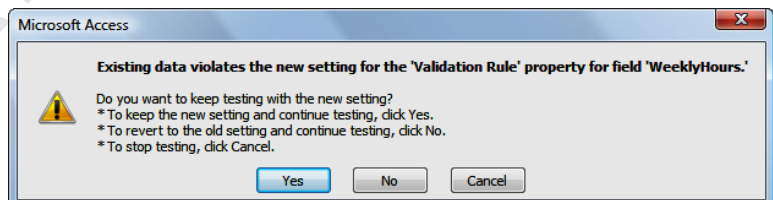
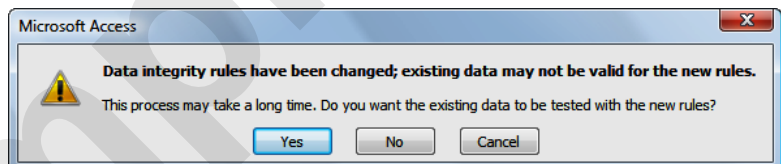
Continue using the previous file with this exercise, or open the file *A813 Data Validation_3.accdb...*

- 1 Right-click on the **Employees** table in the **Navigation** pane and select **Design View**
- 2 Click on **WeeklyHours** to display its **Field Properties**
- 3 Click in **Validation Rule** and type **<=35** then press **Tab** to move to **Validation Text**
- 4 Type **Weekly hours cannot exceed 35** then press **Tab**
- 5 Click on **Save**  to save the design changes
You will now be asked if you wish to test the rule against existing records...
- 6 Click on **[Yes]** to test all of the records
This time a violation error appears, indicating that some records do not match the new rule. We'll correct this later...
- 7 Click on **[Cancel]** to stop testing records
- 8 Click on **Close**  to close the table

4



Field Properties	
General	Lookup
Field Size	Long Integer
Format	
Decimal Places	1
Input Mask	
Caption	
Default Value	35
Validation Rule	<=35
Validation Text	Weekly hours cannot exceed 35
Required	No
Indexed	No
Smart Tags	
Text Align	General



For Your Reference...

To **validate numbers**:

1. Open the table in **Design View**
2. Click on the desired field
3. Click in the **Validation Rule** field property and type the rule as an expression (formula)

Handy to Know...

- Common operators used in formulas are:
 - < less than
 - <= less than or equal to
 - > greater than
 - >= greater than or equal to
 - = equal to, and
 - <> not equal to

SETTING REQUIRED FIELDS



There will usually be one or more fields in a table which absolutely must have a value whenever a record is entered. In our *Employees* table, each employee must have an employee number. We

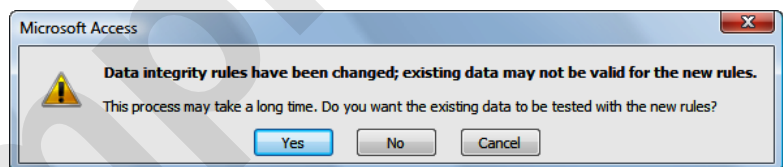
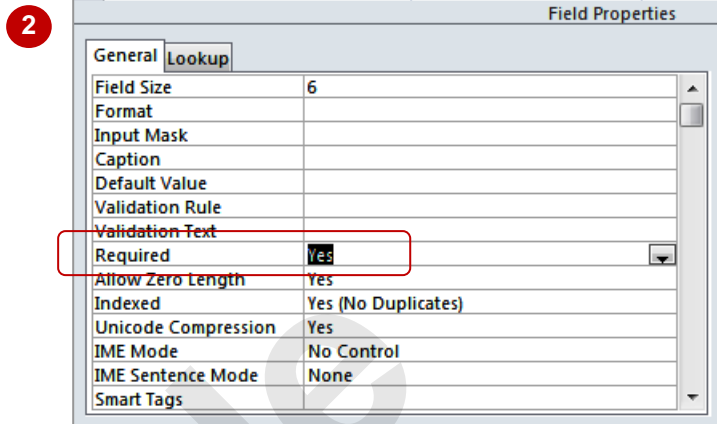
can also **set other fields as required** using the **Required** field property. This will ensure that an entry is made into these fields whenever a new record is created in the table.

Try This Yourself:

Same
File

Continue using the previous file with this exercise, or open the file *A813 Data Validation_4.accdb...*

- 1 Right-click on the **Employees** table in the **Navigation** pane and select **Design View**
- 2 Ensure that **EmpNo** is selected, then double-click on **No** in the **Required** field property, until **Yes** appears
Double-clicking acts as a toggle between No and Yes...
- 3 Repeat steps 2 and 3 for **LastName**, **Started**, **DateOfBirth** and **Salary**
- 4 Click on **Save**  in the **Quick Access Toolbar** to save the design changes
You will now be asked if you wish to test the rule against existing records...
- 5 Click on **[No]** to skip record testing
- 6 Click on **Close**  to close the table



For Your Reference...

To **mark a field as required**:

1. Open the table in **Design View**
2. Click on the desired field
3. Double-click on the current value in the **Required** field property until **Yes** appears

Handy to Know...

- You can mix and match field properties to achieve rock solid data entry. For example, you can mark a field as required to ensure that something is entered, and then create a validation rule to ensure it is entered correctly.

WORKING WITH VALIDATIONS



It is a good idea to thoroughly **test the validations** that you enter into a table to ensure that they work as anticipated. This also helps you to understand how your user will see the system,

especially the various error messages that you have created as *Validation Text*. It is important that the messages accurately reflect the *Validation Rules* and how to satisfy them.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *A813 Data Validation_5.accdb...*

- 1 Double-click on the **Employees** table in the **Navigation** pane to open it
 - 2 Click on the **New record** button  at the bottom of the screen to start a new record
 - 3 Type the details as shown, pressing **Tab** after each, to move to the next field
 - 4 Ensure that you are in the **DateOfBirth** field, then type **10/9/07** and press **Tab**
- Because this makes the employee younger than 18, a validation text message will appear...*
- 5 Click on **[OK]**, then double-click on **07** in the date, type **87** and press **Tab** until you reach **Salary**
 - 6 Type **27000** then click on another record to save the new record
 - 7 Click on **Close**  to close the table

200	Mark	O'Connor	Sales & Market	63033	16-Dec
201	Michael	Rockland	Research & De	62026	09-Dec
202	Nazreen	Amirudin	Research & De	62007	20-Nov
203	Philip	Hutchins	Administrator	61011	27-Nov
204	Susan	Baker-Smith	Administrator	61020	16-Dec
205	Trond	Abelseth	Administrator	61014	02-Dec
*					

Record: 106 of 106

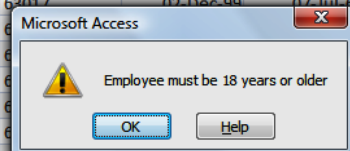
2 Click on the **New (blank)** record button to create a new record

3

EmpNo:	208
FirstName:	Fred
LastName:	Smith
Department:	Administration
PhoneNo:	64705
Started:	04/04/03

Beaman	Sales & Market	62014	27-Nov-99	20-Dec-82	✓
Berninghauser	Research & De	62035	03-Jan-00	27-Jul-67	✓
Munro	Sales & Market	62017	02-Dec-99	07-Jul-65	✓
Badea	Research & De	62014	03-Jan-00	27-Jul-67	✓
O'Connor	Sales & Market	63033	16-Dec-00	02-Dec-99	✓
Rockland	Research & De	62026	09-Dec-00	20-Nov-00	✓
Amirudin	Research & De	62007	20-Nov-00	27-Nov-00	✓
Hutchins	Administrator	61011	27-Nov-00	16-Dec-00	✓
Baker-Smith	Administrator	61020	16-Dec-00	02-Dec-99	✓
Abelseth	Administrator	61014	02-Dec-99	26-May-81	✓
Smith	Administrator	64705	04-Apr-03	10/9/07	✓

106 of 106



4

For Your Reference...

To **work with validations**:

1. Open the table in **Datasheet View** and create a new record
2. Enter data into the fields – correct errors as they are notified to you

Handy to Know...

- The trickiest validation is the **Required** property. If you leave a required field empty you will only be notified when you move off the record – this is when Access attempts to save the record and discovers that something that is required has been missed.

Formatting refers to the process of changing the appearance of something, usually so that it is more pleasing or easier to read.

The default formatting for tables in Access is rather pedestrian. Fortunately Access provides a number of tools for formatting tables including changing the gridlines between columns and rows, shading the background of cells, and changing fonts and font colours.

Since tables can be easily printed, formatting a table provides a quick and efficient way of creating and printing simple reports of the data.

In this session you will:

- ✓ learn how to change the width of table columns
- ✓ learn how to format cells in a table
- ✓ learn how to change the fonts used in a table
- ✓ learn how to move fields in a table
- ✓ learn how to freeze and unfreeze columns in a table
- ✓ learn how to hide columns in a table
- ✓ learn how to unhide columns in a table that have been hidden.

CHANGING COLUMN WIDTHS




Often you will find that the width of a column in **Datasheet** view is not appropriate for the data in the field. Either the column is too small and you can't see the data, or the column is unnecessarily

wide. Access allows you to **change the width of a column**. You can use the **Ribbon** command for a precise sizing or you can drag the column heading using the mouse.

Try This Yourself:

Open
File

Before starting this exercise you **MUST** open the file *A815 Formatting Tables_1.accdb...*

- 1 Double-click on the **Employees** table to open it
- 2 Click on any **LastName** field
- 3 On the **Home** tab of the **Ribbon**, click on **More**  in the **Records** group, and select **Field Width** to display the **Column Width** dialog box
- 4 Type **20** and click on **[OK]** to widen the **LastName** column
- 5 Move the mouse pointer between the **FirstName** and the **LastName** headers, then click and drag right until the **FirstName** field is about half as wide again
- 6 Move the mouse pointer to the border between **Department** and **PhoneNo**, then double-click to perform a best fit on the **Department** column
- 7 Click on **Save**  in the **Quick Access Toolbar** to save the design changes
- 8 Click on **Close**  to close the table

2

EmpNo	FirstName	LastName	Department	PhoneNo
101	Julianne	Kerr	Executive	60001
102	Harry	Jones	Executive	60002
103	Angel	Harrington	Executive	60003
104	Peter	Dawson	Executive	60004
105	Mark	Jones	Executive	60005
106	Maureen	Grayson	Administrator	61021
107	Augustine	Millson	Administrator	61022
108	Amanda	Bennet	Administrator	61023
109	George	Samuelson	Administrator	61024

3

Column Width

Column Width: 11.5583

Standard Width

OK Cancel Best Fit

4

EmpNo	FirstName	LastName	Department	PhoneNo
101	Julianne	Kerr	Executive	60001
102	Harry	Jones	Executive	60002
103	Angel	Harrington	Executive	60003
104	Peter	Dawson	Executive	60004
105	Mark	Jones	Executive	60005
106	Maureen	Grayson	Administrator	61021
107	Augustine	Millson	Administrator	61022
108	Amanda	Bennet	Administrator	61023
109	George	Samuelson	Administrator	61024


5

EmpNo	FirstName	LastName	Department
101	Julianne	Kerr	Executive
102	Harry	Jones	Executive
103	Angel	Harrington	Executive
104	Peter	Dawson	Executive
105	Mark	Jones	Executive
106	Maureen	Grayson	Administrator
107	Augustine	Millson	Administrator
108	Amanda	Bennet	Administrator
109	George	Samuelson	Administrator


Positioned between two column headers, the pointer changes to a double-headed arrow...

For Your Reference...

To **adjust table column widths**:

1. Click in the column, then click on **More**  in the **Records** group, and select **Field Width**
- OR
1. Drag the field name border to change width

Handy to Know...

- To retain the changes to layouts you must save them by clicking on **Save**  in the **Quick Access Toolbar**.
- Changing the width of a column on screen doesn't change the field size property – the field size determines how much data can be placed in a field.

FORMATTING CELLS IN THE TABLE






Access provides a number of options for changing things such as the grid lines displayed in the table, the background colours of cells, the alternate background colours of cells and much

more. **Formatting cells in the table** is achieved using the various commands on the **Ribbon**, or through the options in the **Datasheet Formatting** dialog box.

Try This Yourself:

Same File

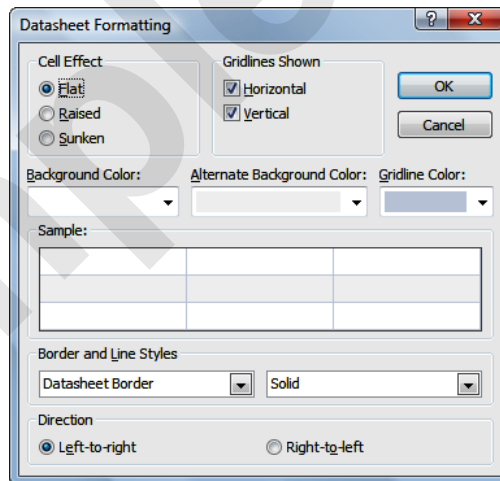
Continue using the previous file with this exercise, or open the file *A815 Formatting Tables_2.accdb...*

- 1 Double-click on the **Employees** table to open it
- 2 On the **Home** tab of the **Ribbon**, click on the dialog box launcher  in the **Text Formatting** group
- 3 Click on the options in **Cell Effect** and observe the changes in the **Sample** – when done, click on **Flat**
- 4 Click on the drop arrow  for **Alternate Background Colour** and click on **Maroon 2**
- 5 Click on **Horizontal** and **Vertical** in **Gridlines Shown** until they both appear ticked
- 6 Click on the drop arrow  for **Gridline Colour** and click on **Green**
- 7 Click on **[OK]** to apply the changes
- 8 Click on **Save**  in the **Quick Access Toolbar** to save the design changes
- 9 Click on **Close**  to close the table

EmpNo	FirstName	LastName	Department	Ph
101	Julianne	Kerr	Executive	600
102	Harry	Jones	Executive	600
103	Angel	Harrington	Executive	600
104	Peter	Dawson	Executive	600
105	Mark	Jones	Executive	600
106	Maureen	Grayson	Administration	610
107	Augustine	Millson	Administration	610
108	Amanda	Bennet	Administration	610
109	George	Samuelson	Administration	610

1

2




EmpNo	FirstName	LastName	Department	Ph
101	Julianne	Kerr	Executive	600
102	Harry	Jones	Executive	600
103	Angel	Harrington	Executive	600
104	Peter	Dawson	Executive	600
105	Mark	Jones	Executive	600
106	Maureen	Grayson	Administration	610
107	Augustine	Millson	Administration	610
108	Amanda	Bennet	Administration	610
109	George	Samuelson	Administration	610

7

For Your Reference...

To **change cell formatting**:

1. Click on the dialog box launcher  in the **Font** group
2. Change the effects as desired
3. Click on **[OK]**

Handy to Know...

- Unlike a spreadsheet application such as Microsoft Excel, you can't change individual cells. In Access, formatting a table is all or nothing.

CHANGING FONTS

Access uses a set of standard fonts to display your data in a Datasheet – but, hey, it doesn't have to. You can **change the font** and apply virtually any font installed on your computer to

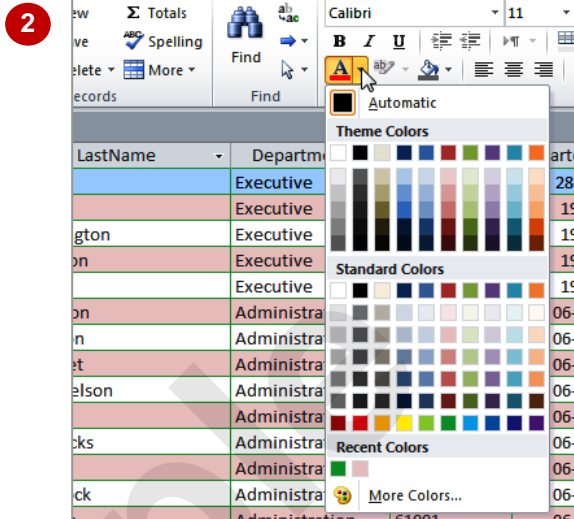
the data in a Datasheet. You can increase or decrease the font sizes, apply coloured fonts, and much more. Most importantly, make sure you use a font that is easy to read for accuracy's sake.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *A815 Formatting Tables_3.accdb...*

- 1 Double-click on the **Employees** table to open it
- 2 Click on the drop arrow for **Font Colour**  to display a palette of colours
- 3 Click on **dark blue** to change the colour of the fonts to dark blue
- 4 Click on the drop arrow for **Font Size** and click on **14** to increase the font size
Oops, a little overwhelming...
- 5 Click on the drop arrow for **Font Size** and click on **9** to decrease the font size
Hmm, now it's underdone...
- 6 Click on the drop arrow for **Font Size** and click on **11** to increase the font size
- 7 Click on **Save**  to save the design changes
- 8 Click on **Close**  to close the table



4

EmpNo	FirstName	LastName	Department
101	Julianne	Kerr	Executive
102	Harry	Jones	Executive
103	Angel	Harrington	Executive
104	Peter	Dawson	Executive
105	Mark	Jones	Executive
106	Maureen	Grayson	Administration
107	Augustine	Millson	Administration

5

EmpNo	FirstName	LastName	Department
101	Julianne	Kerr	Executive
102	Harry	Jones	Executive
103	Angel	Harrington	Executive
104	Peter	Dawson	Executive
105	Mark	Jones	Executive
106	Maureen	Grayson	Administration
107	Augustine	Millson	Administration
108	Amanda	Bennet	Administration
109	George	Samuelson	Administration
110	Neville	Smith	Administration
111	Petra	Henricks	Administration
112	Widow	Clark	Administration

For Your Reference...

To **change the fonts** in a table:

1. Click on the respective drop arrows in the **Ribbon** for the **Font**, **Font Size**, and **Font Colour** commands
2. Click on the appropriate option

Handy to Know...

- There are a myriad of possibilities available with the font formatting options. However, sometimes just keeping the defaults is the most pleasing to the eye – don't go overboard with gawdy fonts and colours unless you are really trying to make a statement.

MOVING COLUMNS IN A TABLE



The order in which columns are presented in a table is determined by the order in which fields were defined in the **design** of the table. While these positions may have made sense when the

table was designed, they may be inappropriate for viewing the data in a table. You can alter the column positions in a table and **move columns** around by dragging.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *A815 Formatting Tables_4.accdb...*

- 1 Double-click on the **Employees** table to open it
- 2 Click on the **LastName** field header to select the entire column
- 3 Move the mouse pointer to the bottom of the field name until the pointer changes to a 4-headed arrow – this is the **move** pointer
- 4 Hold down the left mouse button and drag left until a thick line appears to the left of the **FirstName** column
- 5 Release the mouse button to reposition the **LastName** column
- 6 Click on **Save**  to save the design changes
- 7 Click on **Close**  to close the table

2

EmpNo	FirstName	LastName	Department
101	Julianne	Kerr	Executive
102	Harry	Jones	Executive
103	Angel	Harrington	Executive
104	Peter	Dawson	Executive
105	Mark	Jones	Executive
106	Maureen	Grayson	Administration
107	Augustine	Millson	Administration
108	Amanda	Bennet	Administration
109	George	Samuelson	Administration

3

EmpNo	FirstName	LastName	Department
101	Julianne	Kerr	Executive
102	Harry	Jones	Executive
103	Angel	Harrington	Executive
104	Peter	Dawson	Executive
105	Mark	Jones	Executive
106	Maureen	Grayson	Administration
107	Augustine	Millson	Administration
108	Amanda	Bennet	Administration
109	George	Samuelson	Administration

4

EmpNo	FirstName	LastName	Department
101	Julianne	Kerr	Executive
102	Harry	Jones	Executive
103	Angel	Harrington	Executive
104	Peter	Dawson	Executive
105	Mark	Jones	Executive
106	Maureen	Grayson	Administration
107	Augustine	Millson	Administration
108	Amanda	Bennet	Administration
109	George	Samuelson	Administration

5

EmpNo	LastName	FirstName	Department
101	Kerr	Julianne	Executive
102	Jones	Harry	Executive
103	Harrington	Angel	Executive
104	Dawson	Peter	Executive
105	Jones	Mark	Executive
106	Grayson	Maureen	Administration
107	Millson	Augustine	Administration
108	Bennet	Amanda	Administration
109	Samuelson	George	Administration

For Your Reference...

To **move a field** in a table:

1. Click on the column header of the field to select it
2. Drag the column to the desired location

Handy to Know...

- Dragging field headers in a table does not alter the position of fields in the table structure when viewed in **Design** view.

FREEZING COLUMNS IN A TABLE

When you have a table that contains many fields, chances are that as you scroll right through the table, the information in the fields at the left will disappear because the screen is not wide

enough to display all of the data. This can be annoying, particularly if there is *reference point data* in the left fields. You can **freeze columns in a table**, thereby keeping fields locked on the screen.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *A815 Formatting Tables_5.accdb...*

- 1 Double-click on the **Employees** table to open it
- 2 Click on the **EmpNo** header, hold down **Shift** and click on the **LastName** header to select both fields
- 3 On the **Home** tab of the **Ribbon**, click on **More** in the **Records** group, then click on **Freeze Fields**
The selected fields will now be locked on the screen...
- 4 Using the horizontal scroll bar, scroll right until **WeeklyHours** appears next to **LastName**
Let's unfreeze the fields again...
- 5 Click on **More** and click on **Unfreeze All Fields**
- 6 Click on **Save** to save the design changes
- 7 Click on **Close** to close the table

2

EmpNo	LastName	FirstName	Department
101	Kerr	Julianne	Executive
102	Jones	Harry	Executive
103	Harrington	Angel	Executive
104	Dawson	Peter	Executive
105	Jones	Mark	Executive
106	Grayson	Maureen	Administration
107	Millson	Augustine	Administration
108	Bennet	Amanda	Administration
109	Samuelson	George	Administration

4

EmpNo	LastName	WeeklyHou	Salary	Comments
101	Kerr	40	\$250,000.00	
102	Jones	40	\$140,000.00	
103	Harrington	40	\$145,000.00	
104	Dawson	40	\$140,000.00	
105	Jones	40	\$132,000.00	
106	Grayson	40	\$85,000.00	
107	Millson	40	\$85,000.00	
108	Bennet	40	\$87,000.00	
109	Samuelson	40	\$98,000.00	

5

EmpNo	LastName	FirstName	Department
101	Kerr	Julianne	Executive
102	Jones	Harry	Executive
103	Harrington	Angel	Executive
104	Dawson	Peter	Executive
105	Jones	Mark	Executive
106	Grayson	Maureen	Administration
107	Millson	Augustine	Administration
108	Bennet	Amanda	Administration
109	Samuelson	George	Administration

For Your Reference...

To **freeze columns** in a table:

1. Select the column(s) to freeze
2. Click on **More** in the **Records** group, and click on **Freeze**

Handy to Know...

- You can only freeze columns that are next to one another. If you wish to freeze a column further to the right you will need to drag it left so that it is moved to the left of the screen.