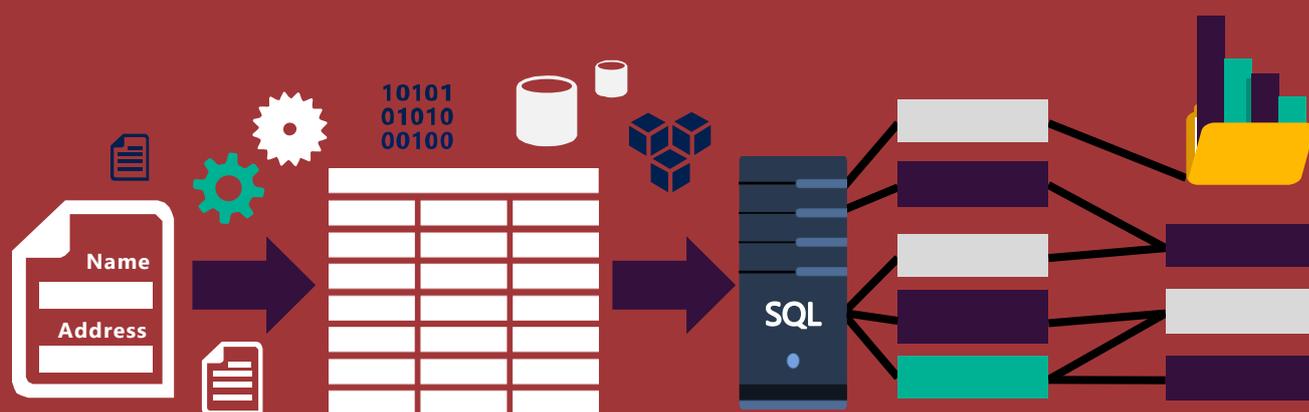
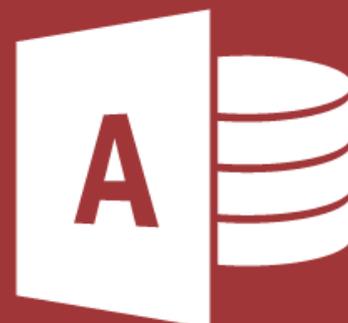




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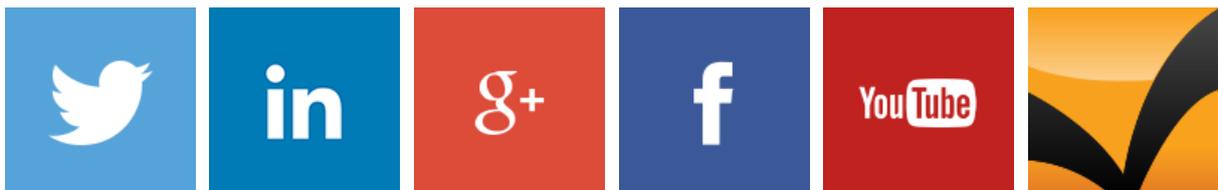
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# Unit 1: Creating a relational database

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In this unit you will learn how to:

- Set relationships between tables
- Create relationship types
- Set referential integrity between tables

## Set relationships between tables

---

### **Why create relationships between tables?**

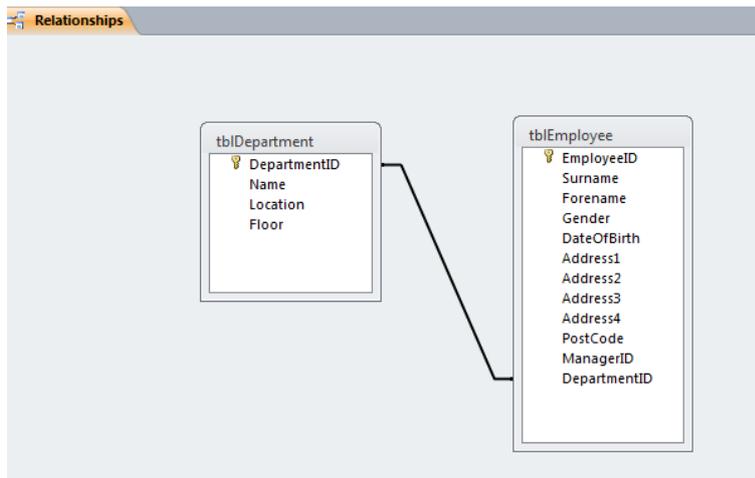
Access is a relational database. It allows multiple tables to be linked with each other via common fields. The links can be made from the relationship diagram (Database Tools, Relationships) and the linking fields must have the same data type.

Quite often the Primary Key from one table is linked to the same field in another table (termed a foreign key).

But why do we have to have multiple tables in the first place?

The main reason for creating databases with several tables is to avoid duplication of data and allow changes to be made most efficiently.

In this example suppose there are 300 employees and 10 departments. Without the department table the name, location and floor would have to be input 300 times. With the 2 tables only the DepartmentID needs to be entered.



And in the future if a department location and floor changes there is no need to edit each employee record.

## Relationship types

---

### One to Many

When a primary key field is linked to a foreign field in a second table a one to many relationship is created. For example

One employee has many orders.

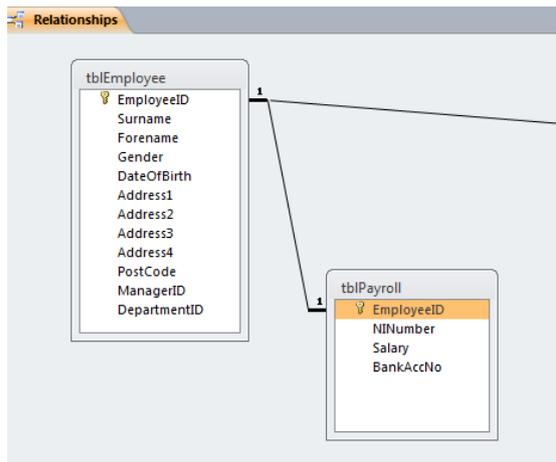
One order has many order detail records.

One customer has many orders.

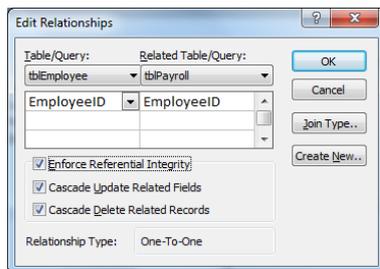
### One to One

When a primary key field in one table is linked to a primary key field in another then a One to One relationship is created. For example

Employee records linked to payroll records.



The reason herefor creatign a one to one relationship is to keep the payroll data separate from the main employee data. It would make sence to have both cascade update ans delete on for these tables.



## Many to Many

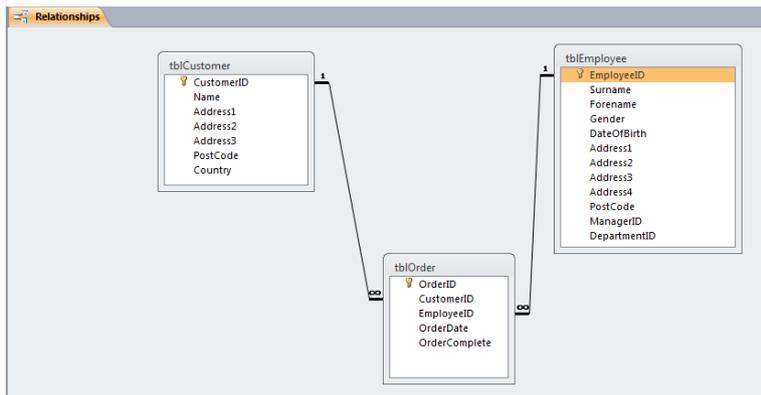
A further type of relationship that occurs in a relational database is called many to many.

For example,

Many customers can buy from one sales employee and many sales employee can sell to one customer.

So there is a many to many relationship between tblCustomers and tblEmployee.

However, there are no common fields between these tables so they can't be linked directly. What is needed is a third table called a conjunction table (or mapping table).



The table **tblOrder** is the conjunction table that links between two tables in a many to many relationship.

Queries or reports can then be set up to show customers for each employee:

Surname	Name
Darcine	Heckatt
Darcine	MLK
Goodwin	James Lewis
Goodwin	MLK
Grey	James Lewis
Grey	VMH Industries
Hamsen	Cartoum
Hamsen	Heckatt
Hamsen	James Lewis
Hamsen	VMH Industries
Hamsen	WH Smythsons
Thewliss	Heckatt
Thewliss	WH Smythsons

or employees for each customer:

Name	Surname
Cartoum	Hamsen
Heckatt	Darcine
Heckatt	Hamsen
Heckatt	Thewliss
James Lewis	Goodwin
James Lewis	Grey
James Lewis	Hamsen
MLK	Darcine
MLK	Goodwin
VMH Industries	Grey
VMH Industries	Hamsen
WH Smythsons	Hamsen
WH Smythsons	Thewliss

To make this data easier to read a query property called unique values is set to yes. (no duplicate records).

## Join Type

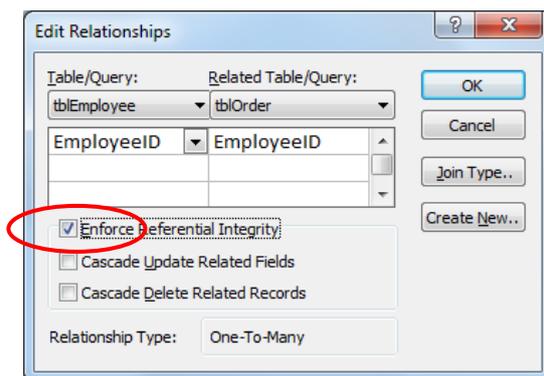
As well as there are different types of relationship there are also different types of join.

The default join type is called an inner join where queries produce only data that is matched by both tables. For example, when querying customers and orders a query shows customers that have orders and not customers that haven't.

Join Type is covered in more detail in the next unit.

## Referential integrity between tables

---



Once a relationship is created between 2 tables there further options become available for controlling how data is entered or removed from the tables.

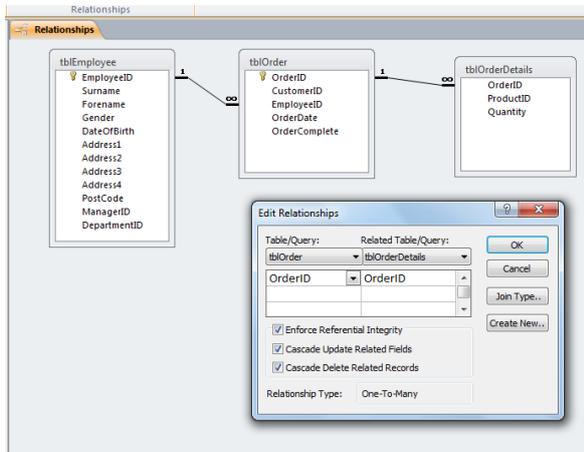
**Enforce Referential Integrity** – Ticking this option prevents data being entered into the secondary table (tblEmployee) if the EmployeeID doesn't exist in the primary table (tblOrder).

In addition a record from the Primary table cannot be deleted if there are records in the secondary table with that EmployeeID.

**Cascade Update** - Ticking this option changes an EmployeeID in the secondary table if the EmployeeID field is changed in the secondary table.

**Cascade Delete** – Ticking this option deletes all related records if a record in the primary table is deleted.

It would be preferable to include both cascade update and cascade delete when linking tblOrders to tblOrderDetails.



Supposing an order is cancelled then deleting the order record will in turn remove related records for that order held in the secondary table (tblOrderDetails).

## Unit 2: Working with Related Tables

---

In this unit you will learn how to:

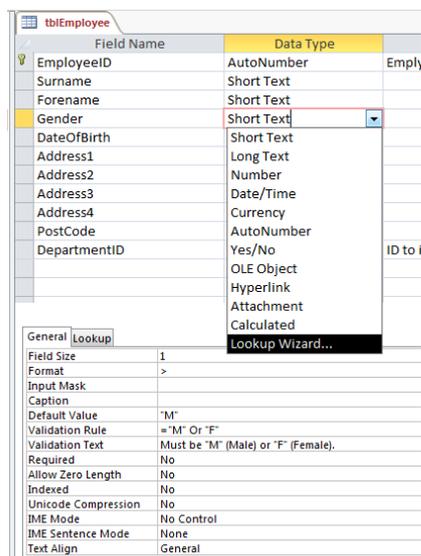
- Use the Lookup Wizard to create a lookup field list
- Use Design view to modify lookup field properties.

### The Lookup Wizard

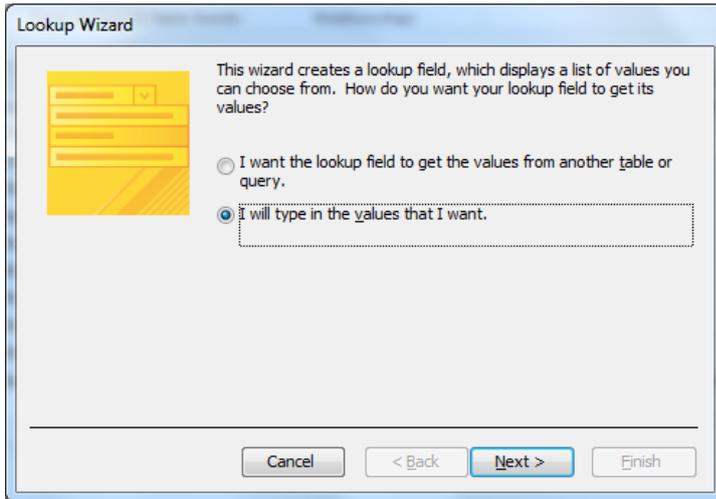
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Lookup fields are very useful for data entry. They help to avoid invalid data being entered into tables and forms. They can be set to lookup into a different table and can even display several columns of data. The field that stores the data is called the bound column.

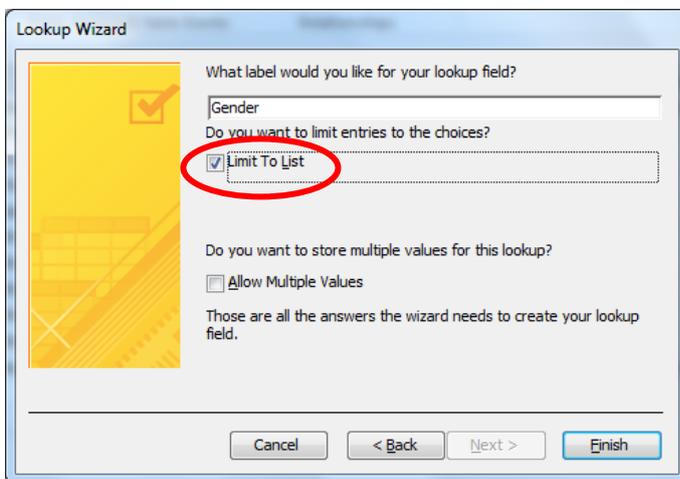
For example, from the Orderingdb database open tblEmployee in design view. We can change the Gender field to a Lookup by right clicking on its Data Type and choosing **Lookup Wizard**.



Access offers 2 choices; to look up from a different table or to create a lookup by typing in the values. For the Gender field choose the second option.



You can then type M and F as the values to choose from and click Next.



Select Limit to List if you want to prevent other values being typed (such as Male or Female)

Click Finish and you will see the lookup field in Datasheet view.

Forename	Gen	DateOfBirth
Knut	M	31/10/1974
Bepe	f	12/10/1945
Tam	M	12/12/1965
Jenny	M	15/04/1955
Margaret	M	02/01/1968
Sosa	F	12/07/1958
Ben	M	12/02/1965
Henri	M	1993
Jean	F	1974
Francine	F	31/10/1970
Charles	M	31/10/1935

If you want to add other entries, then in Design view select the Gender field and click the Lookup tab at the bottom of the screen.

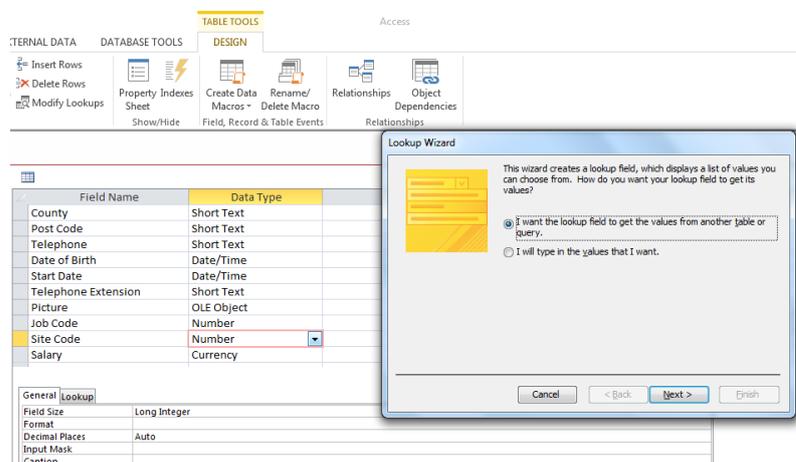
Select the Row Source property and enter a new value:

Property	Value
Display Control	Combo Box
Row Source Type	Value List
Row Source	"M";"F";"U"
Row Source Column	1
Column Count	1
Column Heads	No
Column Widths	2.54 cm

## Lookups into another table

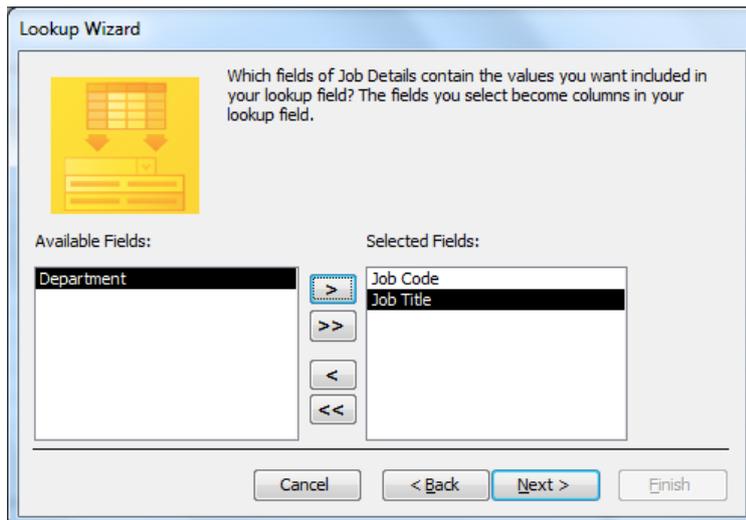
Lookup fields can just as easily be made to lookup data from another table or query. The data must have the same data type but can be a different field name.

For example, in the Practice Linking database, Personal Details table you can create a lookup for the Job Code field. Provided there are no relationships you can use the Lookup Wizard.



Choose the first option 'I want the lookup field to get values from another table'.

On the next screen choose the Job Details table then choose the fields to display in the lookup.



Choose Job Code and Job Title.

On the next screen remove the tick for hiding the key field.

Click Finish to create the lookup.

After saving the table design you can view the lookup field in Datasheet view

Telephone	Picture	Job Code	Site Code	Salary
103		1	1	£22,000.00
205	Picture	1	Receptionist	£24,000.00
308		2	Clerical Officer	£16,000.00
202		3	Director	£45,000.00
303		4	Administration	£14,000.00
206		5	Sales Manager	£17,000.00
203		6	Salesperson	£25,000.00
503	Picture	7	Sales Support	£14,000.00
201		8	Engineer	£10,500.00
507		9	Programmer	£20,500.00
403		10	Help Desk Con	£14,000.00
309	Picture	11	Training Consu	£23,000.00
311	Picture	12	Trainer	£20,500.00
605		13	Training Manag	£17,000.00
414	Picture	14	Project Manag	£14,000.00
505		15	Software Supp	£12,500.00

Changes such as the column widths or the number of columns in the lookup can then be made in Table design view.

## Using Design view to modify Lookup field properties

Lookup field properties can be altered from table design view. They can also be created from scratch without the need for the Lookup Wizard. This is especially convenient when the lookup field is already linked to another table in the database.

In this example a lookup to the Site Code is created in the Personal Details table.

From Table design view select the Site Code field then click on the **Lookup** tab.

Job Code	Number
Site Code	Number
Salary	Currency

General	Lookup
Display Control	Combo Box
Row Source Type	Table/Query
Row Source	Location Details
Bound Column	1
Column Count	2
Column Heads	No
Column Widths	2cm;4cm
List Rows	16
List Width	6cm
Limit To List	No
Allow Multiple Values	No
Allow Value List Edits	No
List Items Edit Form	
Show Only Row Source	No

Change the following properties:

Row Source: Location Details

Column Count: 2

Column Widths: 2cm;4cm

List Width: 6cm

The Site Code field now displays as follows:

Site Code	Salary	Click to Add
1	£22,000.00	
1	London Training Centre	
2	Head Office	
3	North Office	
4	South Office	
5	Midlands Office	
6	West Office	
5	£14,000.00	
2	£10,500.00	
5	£20,500.00	

If you ever want to hide a column such as the Site Code change its column width to 0cm. Remember the field is only hidden and not deleted so the Column Count is still 2 and the Bound Column (or the field storing the data for the lookup) still remains 1.

Note that when you use the Lookup Wizard to lookup from another table then a relationship is automatically created. If you create a lookup by changing lookup properties a relationship is not created.

## Unit 3: Defining data entry rules

---

### In this unit you will learn how to:

- Use the Input Mask wizard
- Setting field properties
- Setting a Validation rule

When data is entered into a table it often helps to add some control over what is typed in.

Input masks are used to add additional characters or change the case of text. Validation rules can be included to restrict the range of data entered. There are further field properties that can be set to ensure a field is not left blank or that data is automatically entered if left blank.

These data entry rules are set up from table design view.

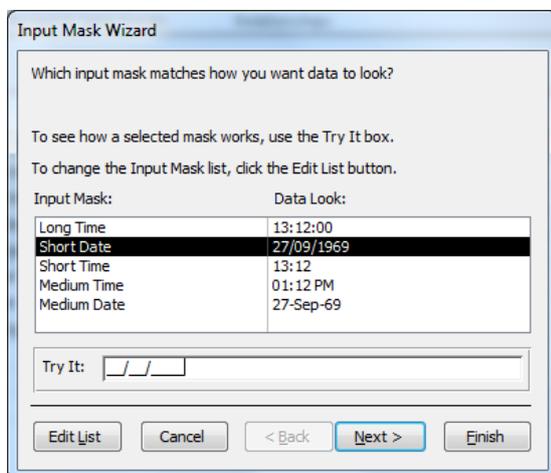
### Use the Input Mask wizard

---

When typing dates, it helps to have an input mask that types in the / symbols for you. When typing telephone numbers, it might help to automatically add spaces or brackets.

For example, for the Date of Birth field select the Input Mask property then click on

...



Choose Short Date. The Try It box shows how the Input mask will display.

Remove 2 zeros from the year then press Finish.

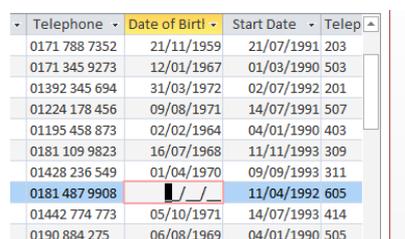
The Input Mask property then displays as

00/00/00;0;\_

In the second part of the code 0 means the extra characters are stored in the database. (1 means the / characters are display but not stored).

The third part is the character used as the place holder. By default Access uses the underscore \_.

After saving the input mask this is how it appears in Datasheet view after saving the table and tabbing to the Date of Birth field.



Telephone	Date of Birth	Start Date	Telep
0171 788 7352	21/11/1959	21/07/1991	203
0171 345 9273	12/01/1967	01/03/1990	503
01392 345 694	31/03/1972	02/07/1992	201
01224 178 456	09/08/1971	14/07/1991	507
01195 458 873	02/02/1964	04/01/1990	403
0181 109 9823	16/07/1968	11/11/1993	309
01428 236 549	01/04/1970	09/09/1993	311
0181 487 9908	##/##/##	11/04/1992	605
01442 774 773	05/10/1971	14/07/1993	414
0190 884 275	06/08/1969	04/01/1990	505

## Input Mask Codes

Here is a list of codes that are used when setting input masks.

Character	Explanation
<b>0</b>	Can enter a digit (0 to 9).
<b>9</b>	Can enter a digit (0 to 9).
<b>#</b>	Can enter a digit, space, plus or minus sign. If skipped, Access enters a blank space.
<b>L</b>	Must enter a letter.

Character	Explanation
?	Can enter a letter.
A	Must enter a letter or a digit.
A	Can enter a letter or a digit.
&	Must enter either a character or a space.
C	Can enter characters or spaces.
.,:;- /	Decimal and thousands placeholders, date and time separators.
>	Coverts all characters that follow to uppercase.
<	Converts all characters that follow to lowercase.
\	Characters immediately following will be displayed literally.
""	Characters enclosed in double quotation marks will be displayed literally.

### Examples of Input Mask

This table shows a few examples of input masks.

Input mask	Example	Notes
(000) 000-0000	(206) 555-0199	
(999) 000-0000	(206) 555-0199 or ( ) 555-0199	Extension is optional
>	E4 9RU	All letters upper case
>L<???????????????	Maria	Proper case
ISBN 0- &&&&&&&&&-0	ISBN 1-55615-507-7	
>LL00000-0000	DB51392-0493	Start with 2 capital letters and 8 numbers
00/00/00	25/12/15	
00\->L<LL\-00	25-Dec-15	
\P000	P123	3 numbers starting with P

## Setting field properties

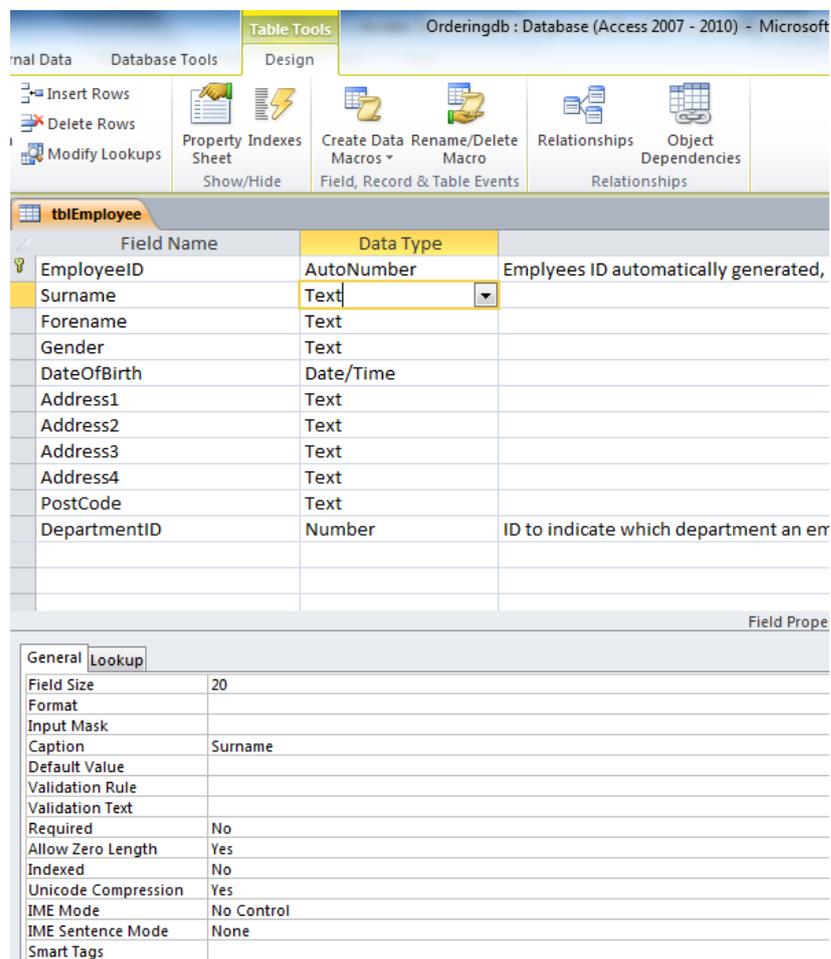
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In Design view there are several properties that can be applied to each field. They vary depending on the data type. For example, for the Surname in the tblEmployee table you can set the following:

### Required

Required: Yes

Allow Zero Length: No



The screenshot shows the Microsoft Access Design view for the 'tblEmployee' table. The 'Surname' field is selected, and its properties are displayed in the 'Field Properties' task pane. The 'Required' property is set to 'No' and 'Allow Zero Length' is set to 'Yes'.

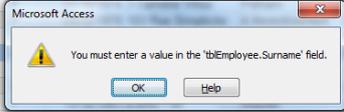
Field Name	Data Type	
EmployeeID	AutoNumber	Employees ID automatically generated,
Surname	Text	
Forename	Text	
Gender	Text	
DateOfBirth	Date/Time	
Address1	Text	
Address2	Text	
Address3	Text	
Address4	Text	
PostCode	Text	
DepartmentID	Number	ID to indicate which department an emp

Field Properties	
Property	Value
Field Size	20
Format	
Input Mask	
Caption	Surname
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

Setting these properties makes Surname a mandatory field. It cannot be left blank.

Employee	Surname	Forename	Gen	DateOfBirtl	Address1	Address2	Address3
001	Hansen	Knut	M	31/10/1974	5 rue Victor Hugo	3 Arrondissement	Paris
002	Hansen	Bepe	f	12/10/1945	144 rue Des Arbres	Lesoyare	Parinterne
003	Thewiss	Tam	M	12/12/1965	10 Dart Street	Yartney	Kent
004	Chen	Jenny	M	15/04/1955	24 Maison Citron	Ramarette	St. Sebastien L
005	De Navare	Margaret	M	02/01/1968	Chateau Lismarine	St Quentin	Portemace L
006	Andabe	Sosa	F	12/07/1958	72 Old Mill House	Fleur Crecy	Exeter D
007	Grey	Ben	M	12/02/1965	23 Bridge Lodge	Southwark	London
008	Darcine	Henri	M	30/06/1993	8 Les Invalides	4 Arrondissement	Paris
009	Walton	Jean					Draintree E
010	Cartouche	Francine					Paris
011	Goodwin	Charles					berts
012	Jules						Paris
015	Lockett	Lucy					london
016	Simone	Paulo					london
017	Jackson	Maria					london
018	Thackeray	Charles	M	20/02/1975	5 Oregon Street	Southwark	London
019	Friedland	Pieter	M	12/06/1965	Kon-Tiki Close	West Kensington	Witting N
020	Hevertahl	Thnr	M	03/04/1962	12 Maison Nima	Bartersea	Vannere H



## Field Size

Another property that can be set is Field Size. For Short Text fields the maximum field size is 255 character. In the tblDepartment table set Floor to a field size or 2.

This prevents a number greater than 99 being entered.

If you need to type more than 255 characters, for example paragraphs of notes or comments then change the data type to Long Text.

## Format

As with the input mask property, the Format property can be set to display additional characters or change text to upper case.

Here are some examples of how a Format setting changes the appearance of data.

Data	Format Setting	Result
Number fields		
1	000	001
1	\E000	E001
Text fields		
London	>	LONDON
	@;Unkonwn	Unknown
12345678	@@@-@@- @@@@	123-45-6789
Date/Time fields		
01/01/2016	ddd dd/mm/yy	Fri 01/01/16
	Short Time	15:00
	Medium Time	03:00 PM

## Unit 4: Use advanced query features

---

### In this unit you will learn how to:

- Join tables in queries
- Create a calculated field
- Create action queries to add, delete, update and make tables.

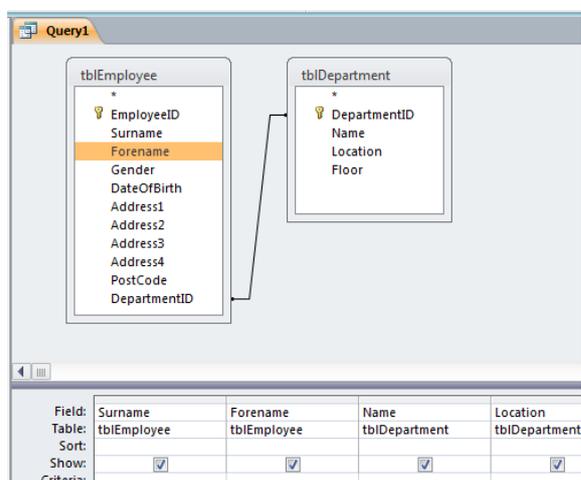
## Join tables in queries

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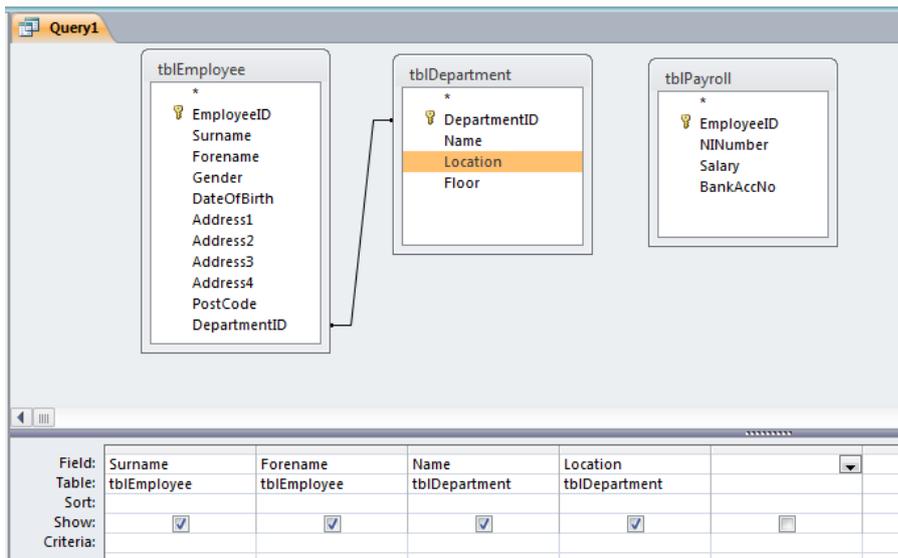
### Joining tables in design view

---

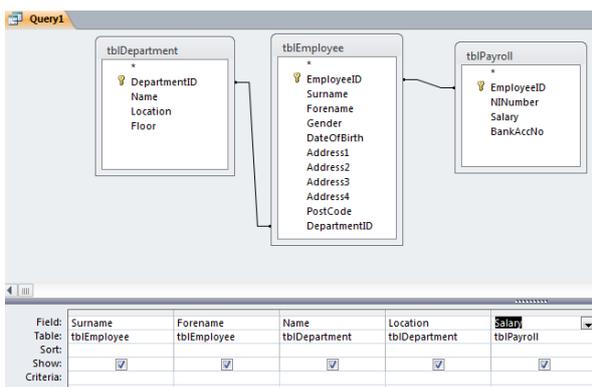
When creating a query by Query Design Access will automatically try to create links between fields with the same name. For example, using the OrderingPracitceLinking database create a query for the tables tblEmployee and tblDepartment.



Suppose you want to include the employee salary then add tblPayroll. This time there is no automatic link so create a link manually from Employeeid to EmployeeID.

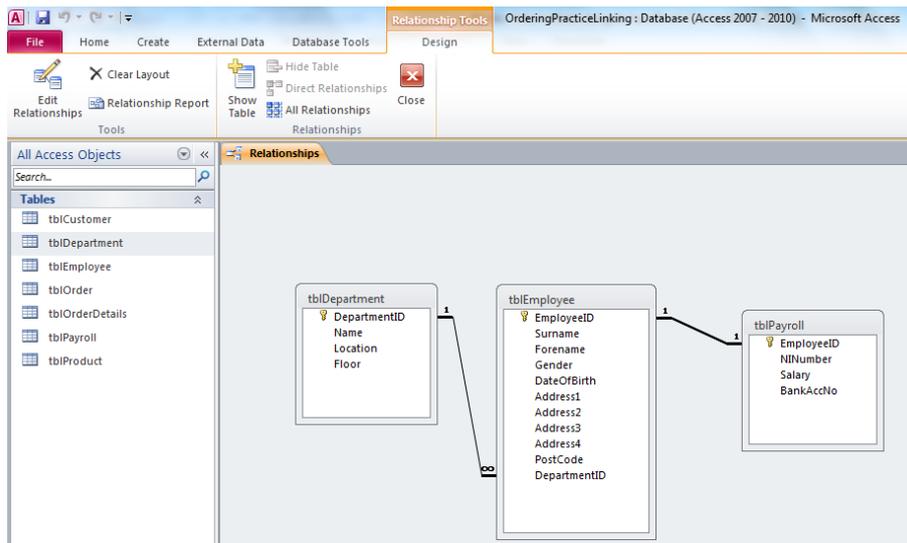


Now add a link line by joining EmployeeID and include the Salary in the query.

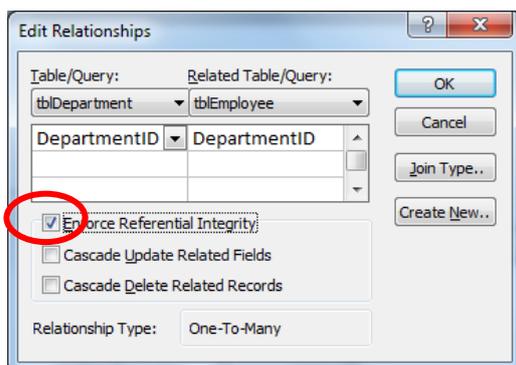


## Using the Query Wizard

When creating queries on multiple tables with the Query wizard links between tables are not automatically created. The tables would need to be added and linked in the Relationships diagram.



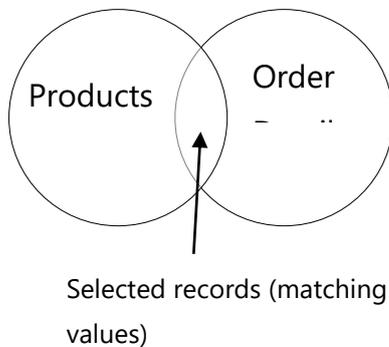
Adding tables to the relationships diagram allows 1 to many and 1 to 1 relationships to be created with Enforced Referential Integrity set.



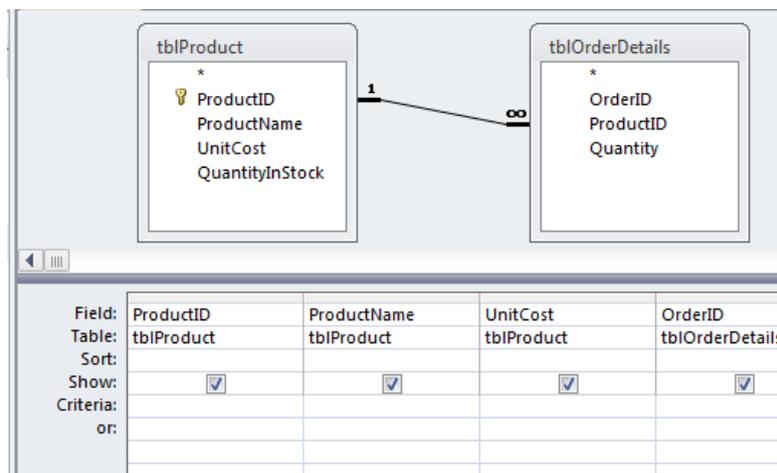
This option prevents department id's being added to tblEmployee that don't exist in tblDepartment (or delectated from if they exist in tblEmployee).

Once tables are added and linked in the relationship diagram then queries and reports can be created with the query wizard and report wizard.

## Inner Joins



An inner join is a join that selects only selects records from two tables that have matching values. It is sometime called a equi-join and it is the default join type in Access.

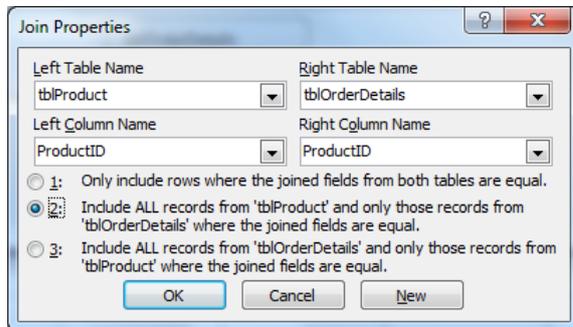


For example, an inner join shows only the products that match with those in order details table (tblOrderDetails).

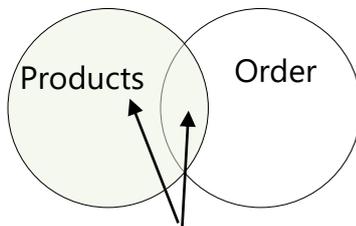
## Outer Joins

An outer join displays all records from one table and only those records where values match from the other table. For example, all products and matching records in tblOrderDetails.

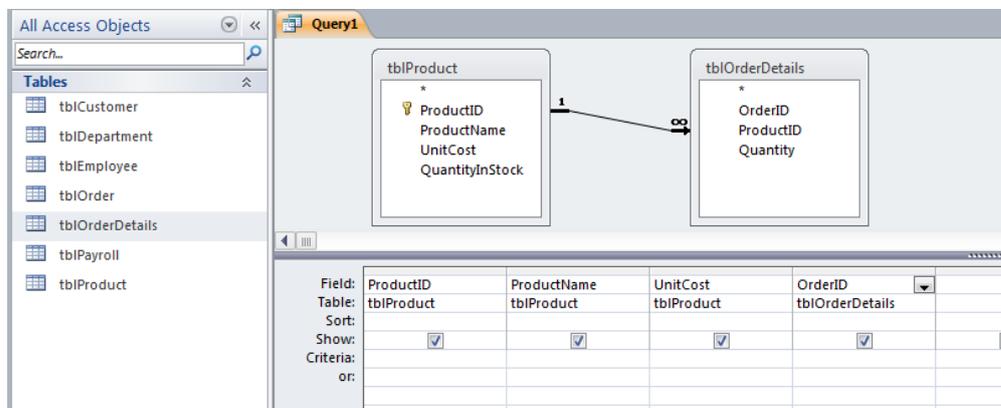
To create an outer join double click on the join line and select 'Include ALL records from tblProducts...'



This is sometime called a left outer join because the primary table (or 1 table in a 1 to many relationship) is conventionally placed on the left in the query.



Selected records (All Products and matching values)



Note that with the outer join query two extra product id's 011 and 013 are displayed. These products do not have order Ids.

ProductID	ProductName	UnitCost	OrderID
009	Tie	£22.95	010
009	Tie	£22.95	017
009	Tie	£22.95	007
009	Tie	£22.95	025
010	Radio	£65.95	009
010	Radio	£65.95	021
010	Radio	£65.95	024
010	Radio	£65.95	026
010	Radio	£65.95	028
010	Radio	£65.95	029
011	Blank CD's (10)	£5.95	
012	Socks	£4.99	007
012	Socks	£4.99	025
013	Pencil Sharpeners (10)	£1.95	
014	Paper Ream	£4.98	022
014	Paper Ream	£4.98	023
015	MP3 Player	£125.95	020
015	MP3 Player	£125.95	021
015	MP3 Player	£125.95	029
016	Pencils (25)	£1.99	022
016	Pencils (25)	£1.99	023
016	Pencils (25)	£1.99	030
017	Fishing Vest	£69.99	026
018	Thermos Flask	£8.95	021
018	Thermos Flask	£8.95	024

To display only these products, add *Is Null* as a Criteria for the OrderId field

A right outer join is the third join type option. ALL records from tblOrderDetails and only those that match from tblProducts.

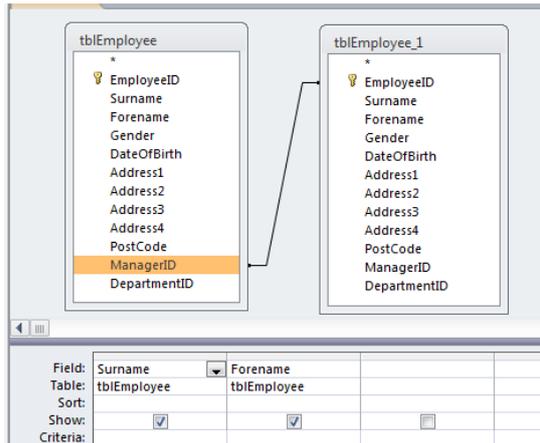
This would show any records in tblOrderDetails where the product ids have been left blank.

### Self-Join Queries

A self-join is a join that relates data within a table itself. As with other joins the fields that are inter related must have the same data type.

For example, suppose an Employee table contains both an EmployeeID and a ManagerID You then wish to create a query showing the Employee names with their Manager's name.

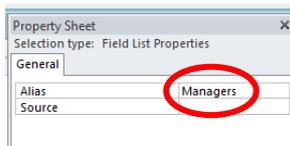
First create a query bases on tblEmployee adding the Surname and Forename fields.



Now add tblEmployee again create a self-join between ManagerID and EmployeeID.

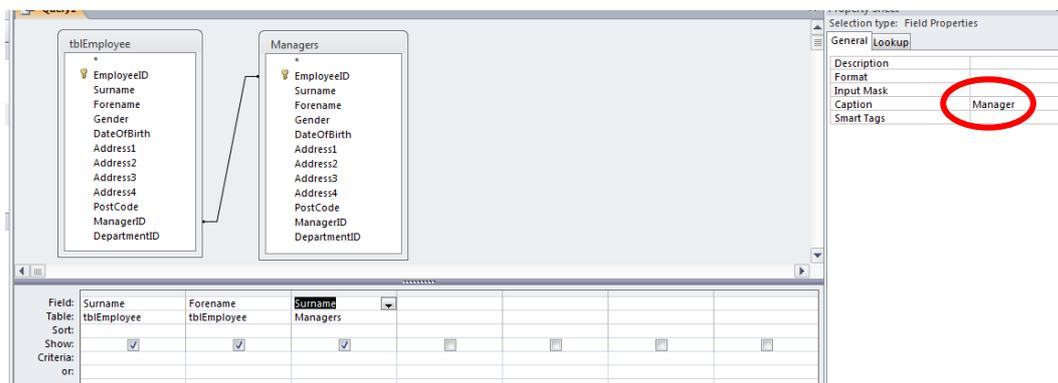
It makes it clearer to change the name of the second table from Employee\_1.

To do that right click the tblEmployee\_1 field list and choose Properties. Type Managers for the Alias property.



Now add the query grid the Surname field from the Managers field list.

Finally change the caption property of the Managers Surname field to Manager.

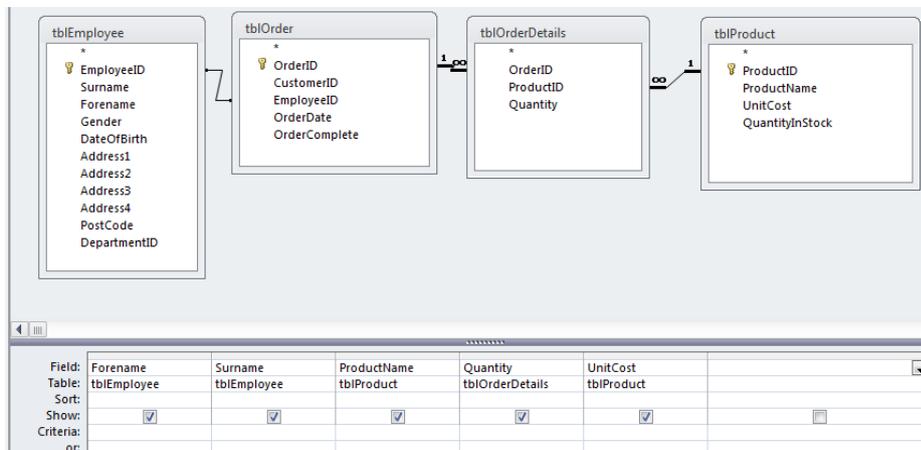


The result of this query shows employees together with their manager's name.

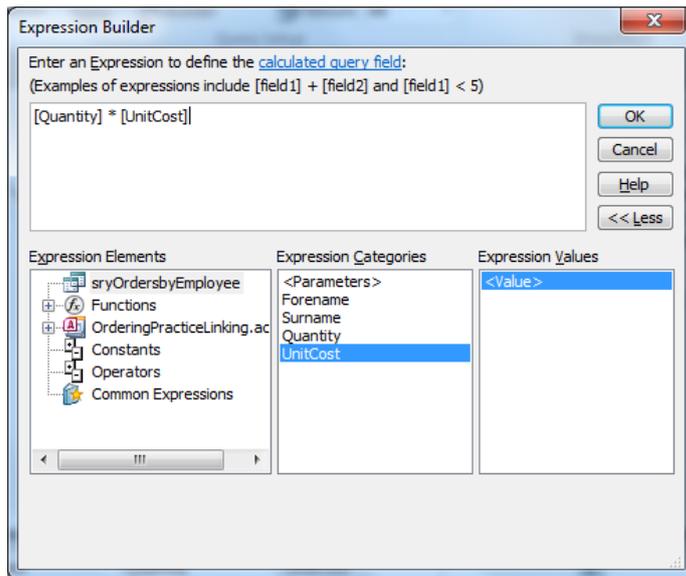
Surname	Forenam	Manager
Hamsen	Knut	Thewliss
Grey	Ben	Thewliss
Lockett	Lucy	Thewliss
Al-Sayeg	Imani	Thewliss
Hamsen	Bepe	Cartouche
Darcine	Henri	Cartouche
Simone	Paulo	Cartouche
Reckitt	Sandy	Cartouche
Thewliss	Tam	Lockett
Walton	Jean	Lockett
Jackson	Maria	Lockett
Jones	David	Lockett
Chen	Jenny	Jackson
Cartouche	Francine	Jackson
Thackeray	Charles	Jackson
De Navarre	Margaret	Heyerdahl
Goodwin	Charles	Heyerdahl
Friedland	Pieter	Heyerdahl
Andabe	Sosa	Al-Sayeg
Marente	Jules	Al-Sayeg
Heyerdahl	Thor	Al-Sayeg

## Create calculated fields

Calculations can be performed within a query by typing the expression at the top of a blank column. For example, suppose you wish to calculate the total cost of orders made by each salesperson. Start by creating a query and save it as qryOrdersbyEmployee including the fields shown below.



At the top of the blank column right click and choose Build...



Double click on fields to select them and add a name for the calculated field as follows:

TotalCost:[Quantity]\*[UnitCost].

### **Combining fields (concatenation)**

A second example of a calculated field is to create the FullName rather than showing the employee names as separate columns. The calculated field combines or concatenates the two fields into one by using the & symbol. As before use the expression builder to avoid spelling errors:

FullName:Forename & " " & [Surname]

The space " " is added to separate the two names.

Now delete the Forename and Surname and view the query.

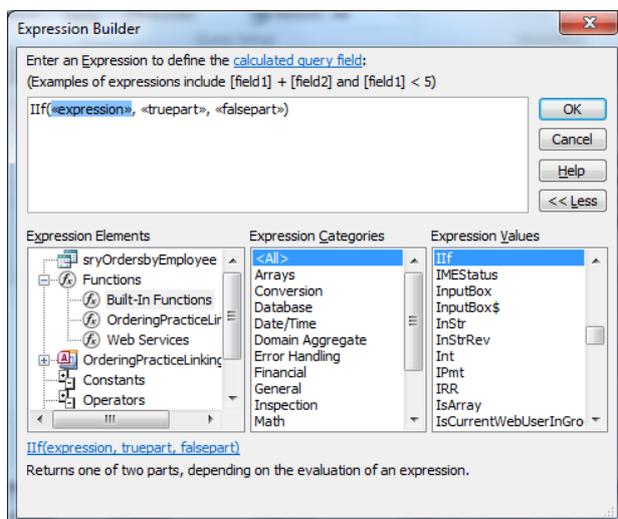
Fullname	ProductName	Quantity	UnitCost	TotalCost
Henri Darcine	Socks	250	£4.99	£1,247.50
Henri Darcine	Shirt	50	£42.95	£2,147.50
Henri Darcine	Erasers (25)	100	£2.99	£299.00
Henri Darcine	Printer Cartridge	50	£4.99	£249.50
Henri Darcine	Cufflinks	125	£45.99	£5,748.75
Henri Darcine	Radio	10	£65.95	£659.50
Knut Hamsen	Shirt	60	£42.95	£2,577.00
Knut Hamsen	Tie	40	£22.95	£918.00
Ben Grey	Cufflinks	100	£45.99	£4,599.00
Tam Thewliss	Tie	45	£22.95	£1,032.75
Henri Darcine	Tie	50	£22.95	£1,147.50
Ben Grey	Alarm Clock	50	£12.99	£649.50
Ben Grey	Vacuum Cleaner	10	£111.50	£1,115.00
Ben Grey	Alarm Clock	10	£12.99	£129.90
Ben Grey	Toaster	15	£45.99	£689.85
Tam Thewliss	Alarm Clock	50	£12.99	£649.50
Tam Thewliss	Erasers (25)	50	£2.99	£149.50
Tam Thewliss	MP3 Player	10	£125.95	£1,259.50
Charles Goodwin	Cufflinks	10	£45.99	£459.90
Charles Goodwin	Radio	100	£65.95	£6,595.00
Charles Goodwin	Thermos Flask	50	£8.95	£447.50
Charles Goodwin	MP3 Player	5	£125.95	£629.75
Charles Goodwin	Toaster	50	£45.99	£2,299.50
Bepe Hamsen	Binders	100	£3.99	£399.00
Bepe Hamsen	Erasers (25)	500	£2.99	£1,495.00

This query can then be saved for later use to create a report of sales by each employee.

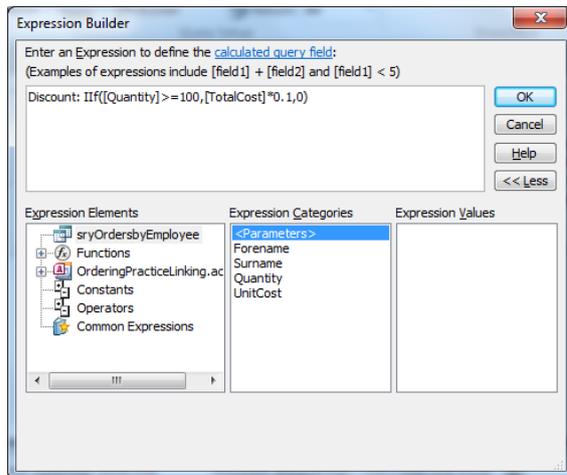
## Using Functions in calculations

Functions can be included in query calculation. They can be selected with the expression builder and included into a calculated field. For example, suppose a discount is to be given for quantities above a certain amount.

To perform the discount calculation, use an **IIF** from Functions, built in Function (the extra I stands for Immediate).



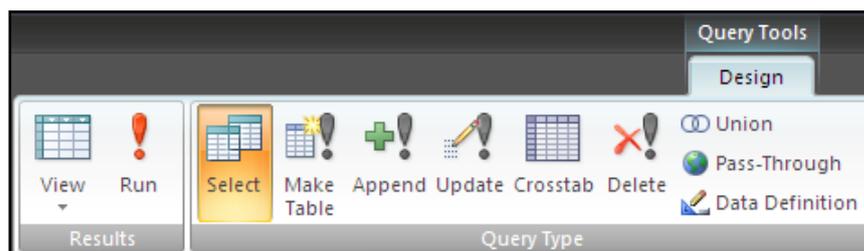
After selecting the IIF function select the qryOrdersbyEmployee from the left column and complete the calculation as follows, naming the expression Discount.



Finally select Properties and format the calculation as Currency.

Fullname	ProductName	Quantity	UnitCost	TotalCost	Discount
Henri Darcine	Socks	250	£4.99	£1,247.50	£124.75
Henri Darcine	Shirt	50	£42.95	£2,147.50	£0.00
Henri Darcine	Erasers (25)	100	£2.99	£299.00	£29.90
Henri Darcine	Printer Cartridge	50	£4.99	£249.50	£0.00
Henri Darcine	Cufflinks	125	£45.99	£5,748.75	£574.88
Henri Darcine	Radio	10	£65.95	£659.50	£0.00
Knut Hamsen	Shirt	60	£42.95	£2,577.00	£0.00
Knut Hamsen	Tie	40	£22.95	£918.00	£0.00
Ben Grey	Cufflinks	100	£45.99	£4,599.00	£459.90
Tam Thewliss	Tie	45	£22.95	£1,032.75	£0.00
Henri Darcine	Tie	50	£22.95	£1,147.50	£0.00
Ben Grey	Alarm Clock	50	£12.99	£649.50	£0.00
Ben Grey	Vacuum Cleaner	10	£111.50	£1,115.00	£0.00

## Create action queries



The most common type of query is called a Select query. It is the default type used when a query is created. Select queries display results but don't directly change tables.

There are other types of queries called **Action Queries** that perform actions directly in tables. There are four types of Action queries:

Append query	This type of query is used to append data from one table to another.
Delete query	This type of query is used to delete records from tables based on specified criterion.
Update query	This type of query is used to update data in different tables at the same time.
Make-table query	This type of query is used to create a table from the result of a query.

Another difference between Action and Select queries is that you must click on the Run (!) button rather than the Datasheet view. If you click only on Datasheet view you see the data *before* the Action query is performed.

### **Example of action queries**

Suppose you want to transfer completed orders from one table to another. This can be done as follows using an Append and Delete query.

#### Creating an Append Query

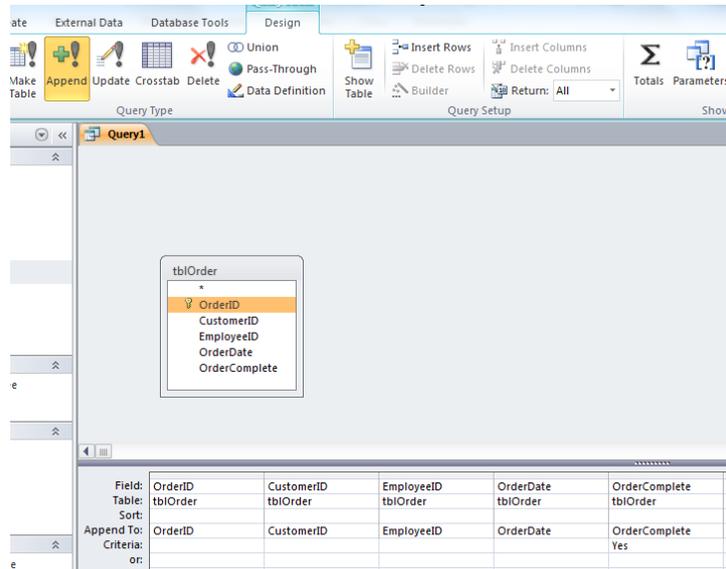
First create a blank copy of the table tblOrders called tblOrdersCompleted.

Change the OrderID field data type to Number. This allows the value of the OrderID to be retained.

1. Select Create, Query Design
2. Select tblOrders as the table to append from
3. Click Append Query
4. Choose tblOrdersCompleted as the table to append to.

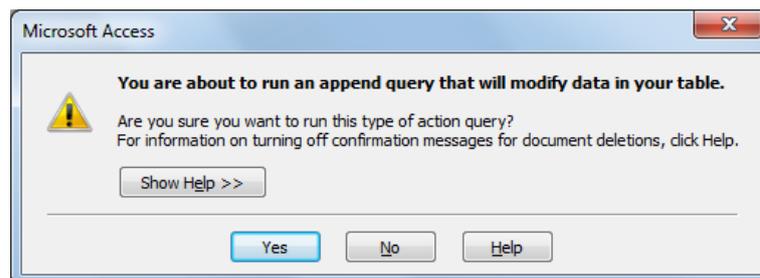
5. Add all fields to the query grid.
6. Now typing Yes (or TRUE) into the OrderComplete criterion will tell the query to only append completed records.

Tip: To select all fields in the field list double click the title of the list.



Now to run this Append query press the **Run (!)** button.

A message appears alerting you that a table will be modified.



After selecting Yes a second message informs you how many records will be appended.



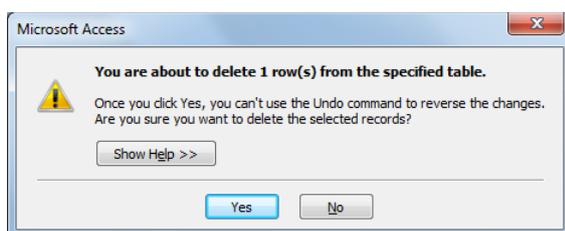
## Creating a Delete query

The append query in the previous example copied the completed orders to a different table but didn't actually move them. A delete action query can be set up to remove the completed order records.

Follow these steps to create the delete query:

1. Select Create, Query Design
2. Select tblOrders as the table to delete from
3. Click Delete Query
4. Add all fields to the query grid.
5. Now typing Yes (or TRUE) into the OrderComplete criterion will tell the query to only delete completed records.

When you press the run button Access prompts twice to alert you that data is about to be deleted.



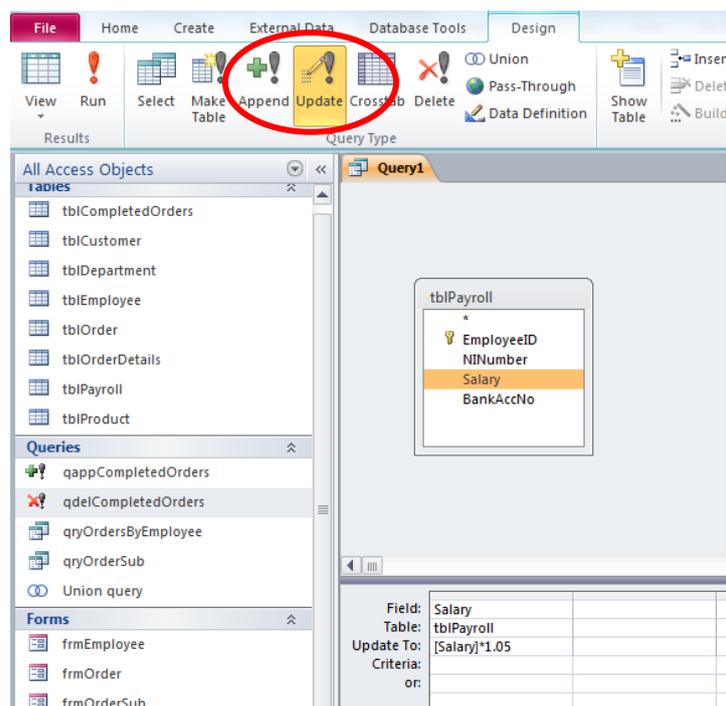
## Creating an Update query

Another type of action query is an Update query. An Update query is used to directly change data held within a table.

For example, suppose you have a table containing salaries and you wish to increase all values by a given percentage. First create a query (in the Orderingdb) and choose the table tblPayroll.

Click the Update query type and in the Update To option type:

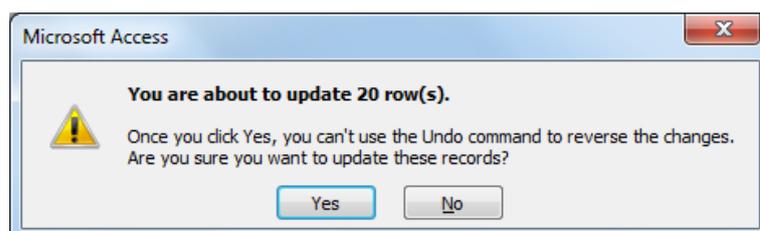
[Salary]\*1.05



To see the original values before running the update query click **View**.

To update and increase all salaries by 5% click **Run**.

Next you will be prompted to confirm that you want to update the salaries of all 20 records.



Open tblPayroll to see that the salaries have changed. Take care not to press run a second time!

An alternative and perhaps safer method is to create a new field in the tblPayroll called NewSalary. First insert the NewSalary field in tblPayroll table.

## Exercise

1. Insert a new field called NewSalary at the end of the tblPayroll table.
2. Create an update query to update the NewSalary field with the 5% salary increase.
3. Run you query to view the new salary values.
4. Save the query as qryCreateNewSalaries.

EmployeeID	NINumber	Salary	BankAccNo	NewSalary
1	JB125678Z	£63,000.00	345346346	£66,150.00
2	HJ092376P	£33,000.00	567457567	£34,650.00
3	TY763476L	£250,000.00	547457546	£262,500.00
4	DF121212P	£25,000.00	436346346	£26,250.00
5	FR151515U	£15,000.00	789345678	£15,750.00
6	YH230938J	£34,000.00	978346856	£35,700.00
7	PO129306J	£55,000.00	346784367	£57,750.00
8	UI046574K	£22,000.00	342354436	£23,100.00
9	IH874309L	£33,000.00	894367856	£34,650.00
10	OI239576M	£240,000.00	234578985	£252,000.00
11	PO234234C	£12,000.00	978345686	£12,600.00
12	DZ450012G	£18,000.00	345231412	£18,900.00
15	TY293957M	£127,000.00	345678743	£133,350.00
16	WE549445V	£33,000.00	785874428	£34,650.00
17	FG435677H	£186,000.00	546484564	£195,300.00
18	TT346523P	£25,000.00	897423654	£26,250.00
19	PL373839H	£36,000.00	354354354	£37,800.00
20	KJ484509P	£152,000.00	656525435	£159,600.00
21	IM239856P	£185,000.00	546987968	£194,250.00
22	KL998872R	£89,000.00	874525641	£93,450.00

Repeat the above exercise but this time use a MakeTable query to create a new table called tblPayRollNew. (Hint: create a select query first and then a calculated field called NewSalary).

## Unit 5: Create advanced queries

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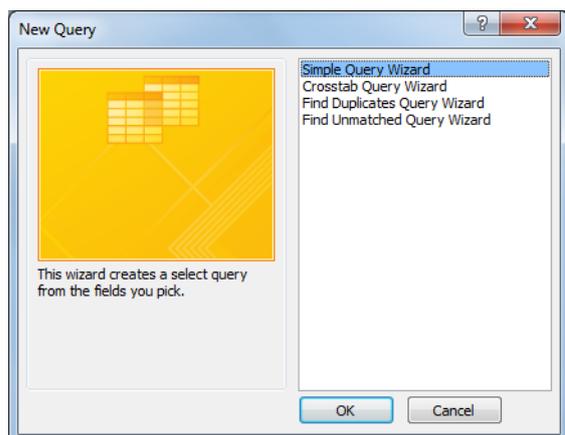
### In this unit you will learn how to:

- Find duplicate records
- Find unmatched records in different table
- Create cross-tab queries
- Use parameter queries to view results based on criteria entered while running a query
- Create indexes to speed up sorting and filtering data in tables

### Find duplicate records

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The Query wizard offers additional queries for perform specific operations.



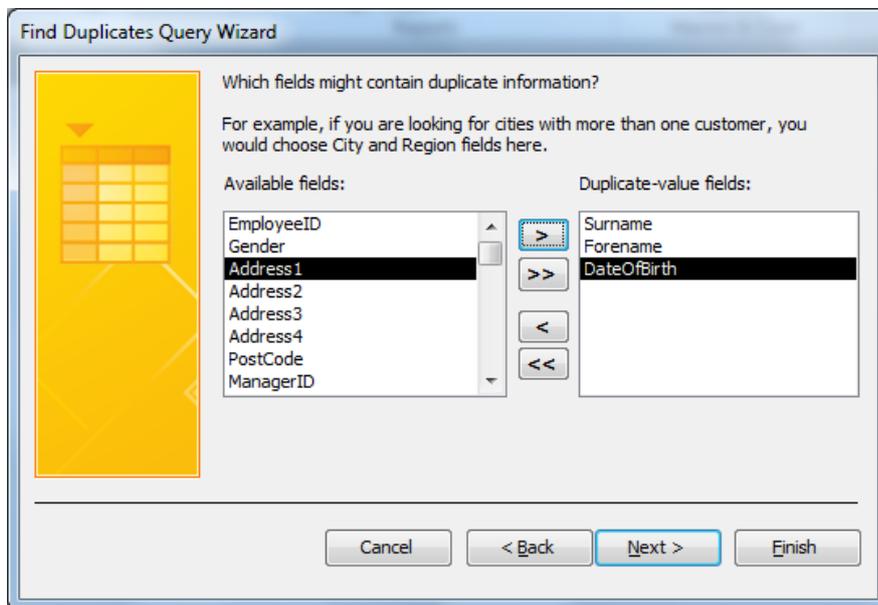
The find duplicates wizard can be useful for displays duplicate records and allowing you to choose which to remove from a table.

For example, suppose you wish to find duplicate records accidentally entered into the tblEmployee table. (For example copy and paste employee 004 and 007 as new duplicate records). They have the same details but different employee ids.

Select Create, Query Wizard

Choose Find Duplicate Query Wizard and select tblEmployee

Click Next and then select the fields that contain duplicate values.  
 Select Forename, Surname and DateofBirth



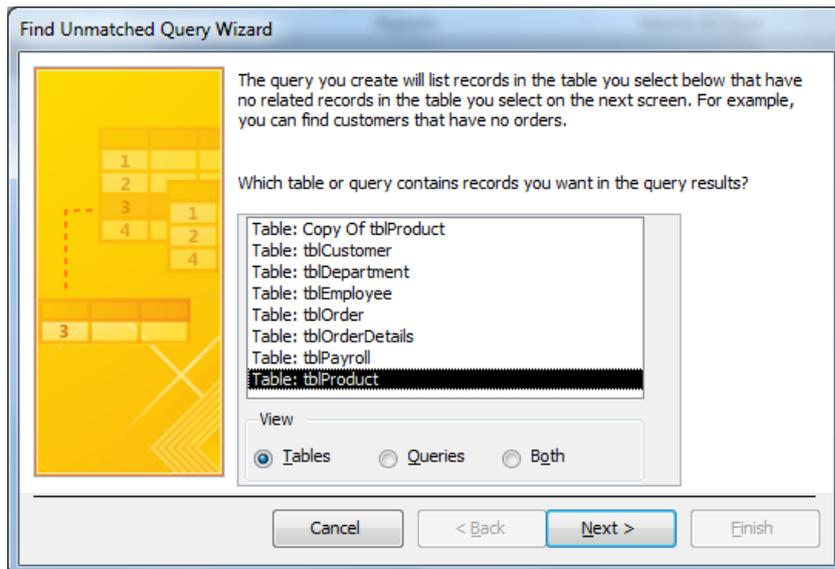
Click Next and choose to view all fields in the result.  
 Click Finish to see the duplicate records.

Surname	Forename	DateOfBirth	Employee	Ger	Address1	Address2	Address3	Address4	PostCode	ManagerID	DepartmentID
Chen	Jenny	15-Apr-55	025	M	24 Maison Citron	Ramaretre	St. Sebastien	Loire	20048	17	002
Chen	Jenny	15-Apr-55	004	M	24 Maison Citron	Ramaretre	St. Sebastien	Loire	20048	17	002
Grey	Ben	12-Feb-65	024	M	23 Bridge Lodge	Southwark	London		GU3 6YH	3	009
Grey	Ben	12-Feb-65	007	M	23 Bridge Lodge	Southwark	London		GU3 6YH	3	009
*				(New)	M						

From the resulting query you can see the duplicate records and choose which one to delete. The records deleted from this query will delete them from tblEmployee table.

### Find unmatched records in different tables

The unmatched query wizard finds records from one table that no longer exist in another.



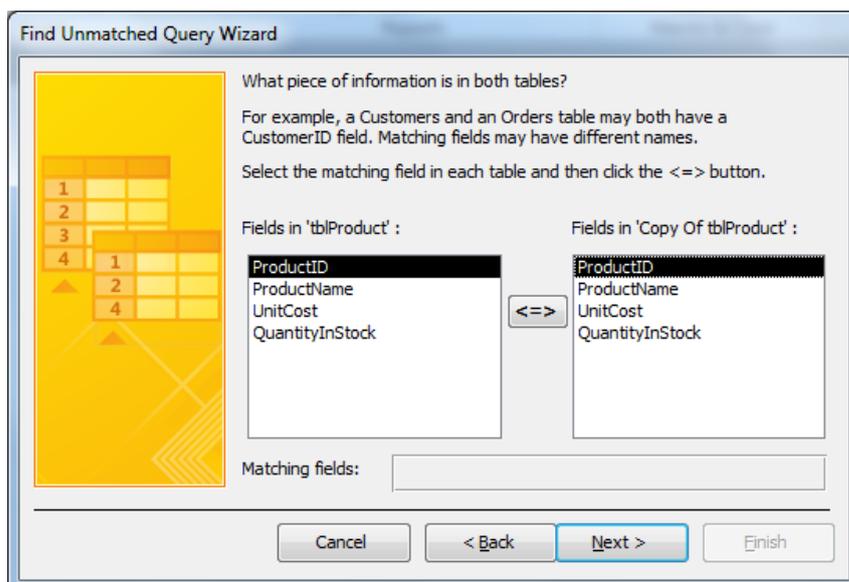
Suppose you create a copy tblProducts and delete two products that are no longer available (011 and 013).

After selecting Create, Query wizard, Find Unmatched query wizard

Select the original table that contains those products (tblProducts).

On the next screen select the new table (Copy of tblProducts).

On the next screen select the ProductID as the common field between the two tables and press the <> button.



Click Finish to see the unmatched records.

ProductID	ProductName	UnitCost	QuantityInStock
011	Blank CD's (10)	£5.95	16789
013	Pencil Sharpeners (10)	£1.95	3565
*	(New)		

The unmatched query wizard also can be used to show records in the copied table that are not in the original tblProduct table. To do that reverse the order of the tables selected.

## Create cross-tab queries

Cross-tab queries have similarities with PivotTables. They can be used to summarize either tables or queries by arranging the data into row and column headings. A numerical value can then be either summed, averaged or counted for each row/column category.

For example for qryOrdersbyEmployee choose the following:

Row heading: ProductName

Column Heading: Fullname

TotalCost: Sum

ProductName	Total Of Tot	Ben Grey	Bepe Hamsen	Charles Goodwin	Henri Darcine	Knut Hamsen	Tam Thewlis
Alarm Clock	£3,442.35	£1,428.90		£1,299.00		£64.95	£649.50
Binders	£1,197.00	£798.00	£399.00				
Blank CD's (10)	£3,599.75	£2,975.00				£29.75	£595.00
Cufflinks	£33,802.65	£4,599.00		£459.90	£28,743.75		
Erasers (25)	£4,186.00		£2,242.50		£299.00		£1,644.50
Fishing Vest	£13,998.00						£13,998.00
Iron	£4,425.00	£737.50		£2,950.00			£737.50
MP3 Player	£8,186.75			£629.75		£6,297.50	£1,259.50
Paper Ream	£5,478.00		£498.00			£4,980.00	
Pencil Sharpeners (10)	£633.75		£585.00				£48.75
Pencils (25)	£3,482.50		£1,492.50			£1,990.00	
Printer Cartridge	£4,491.00		£3,243.50	£499.00	£249.50	£499.00	
Radio	£33,634.50			£16,487.50	£659.50	£6,595.00	£9,892.50
Shirt	£19,757.00				£12,885.00	£2,577.00	£4,295.00
Socks	£3,742.50				£3,742.50		
Tennis Shoes	£2,749.50				£2,749.50		
Thermos Flask	£4,922.50			£4,922.50			
Tie	£19,163.25				£12,622.50	£918.00	£5,622.75
Toaster	£8,508.15	£2,989.35		£5,518.80			
Vacuum Cleaner	£16,167.50	£1,115.00		£15,052.50			

Included in the cross-tab table is an overall total of the row headings, in this case each Product.

Swap row and column headings and a total for each employee will be calculated.

Use the Totals button to see the overall total for the table.

FullName	Total Of TotalCost	Alarm Clock	Binders	Blank CD's (10)	Cufflinks	Erasers (25)	Fishing Vest	Iron	MP3 Player	Paper Ream	Per
Ben Grey	£14,642.75	£1,428.90	£798.00	£2,975.00	£4,599.00			£737.50			
Bepe Hamsen	£8,460.50		£399.00			£2,242.50				£498.00	
Charles Goodwin	£47,818.95	£1,299.00			£459.90			£2,950.00	£629.75		
Henri Darcine	£61,951.25				£28,743.75	£299.00					
Knut Hamsen	£23,951.20	£64.95		£29.75					£6,297.50	£4,980.00	
Tam Thewlis	£38,743.00	£649.50		£595.00		£1,644.50	£13,998.00	£737.50	£1,259.50		
<b>Total</b>	<b>£195,567.65</b>										

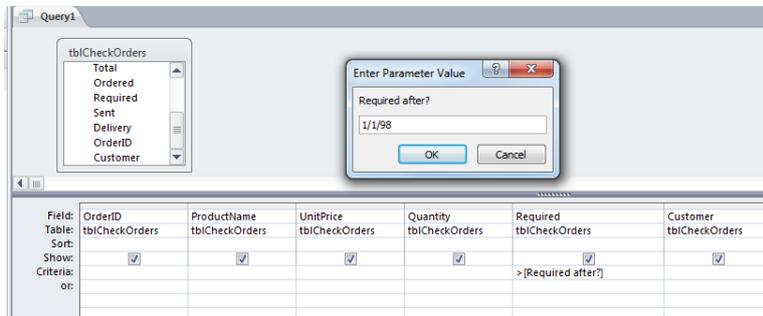
## Use parameter queries

A parameter query displays results based on criteria specified when you run the query.

For example, in the CheckOrders database a parameter query can be set up to ask for a Required Date to be entered.

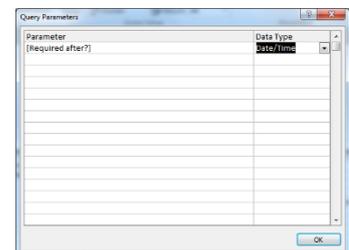
Set up the query design as below entering the criteria for Required as

[Required after?]



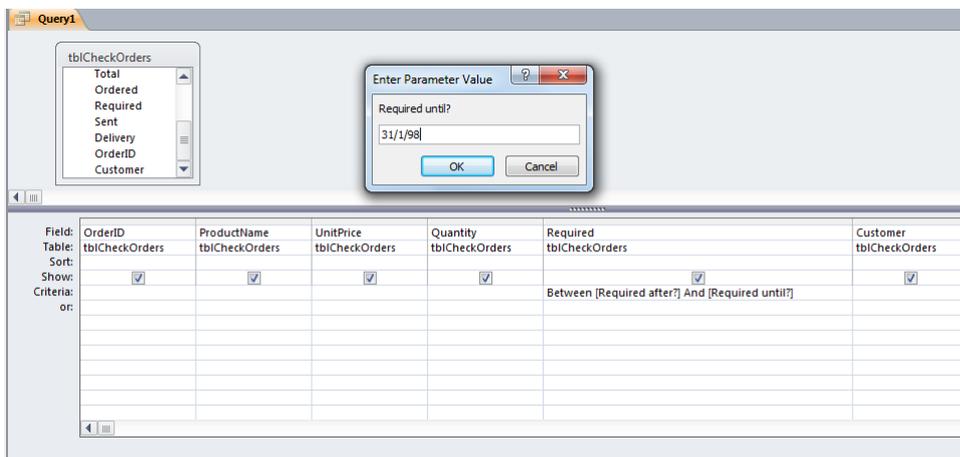
Tip: Click on Parameters to check and validate the date entered. This allows dates in other formats to be entered (eg 31-dec-97, 31.12.97).

### Multiple criteria



More than one Parameter can be added. For example

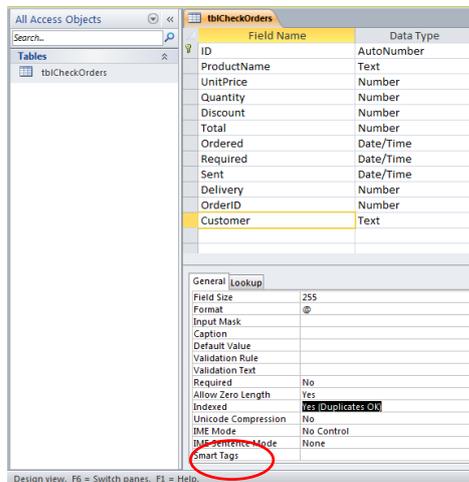
Between [Required after?] And [Required until?]



### Using indexes to speed up sorting and filtering data in tables

With large database tables you can speed up filtering and sorting by adding an Index for the field you are sorting by.

An Index is a file that is not visible but acts as an aid with searching for values in field. Indexes are created in table design view. For example, use set up an index for the Customer field in tblCheckOrders (CheckOrders database).



Choose the option Yes (Duplicates OK).

## Unit 6: Creating advanced form design

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### In this unit you will learn how to:

- Adding graphics to a form
- Add calculations to a form
- Aligning controls
- Changing the tab order
- Adding a combo box

### Use controls to add graphics to a form

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#### Control Type

**Adding graphics** Use the graphics control to add an image or logo to a form.

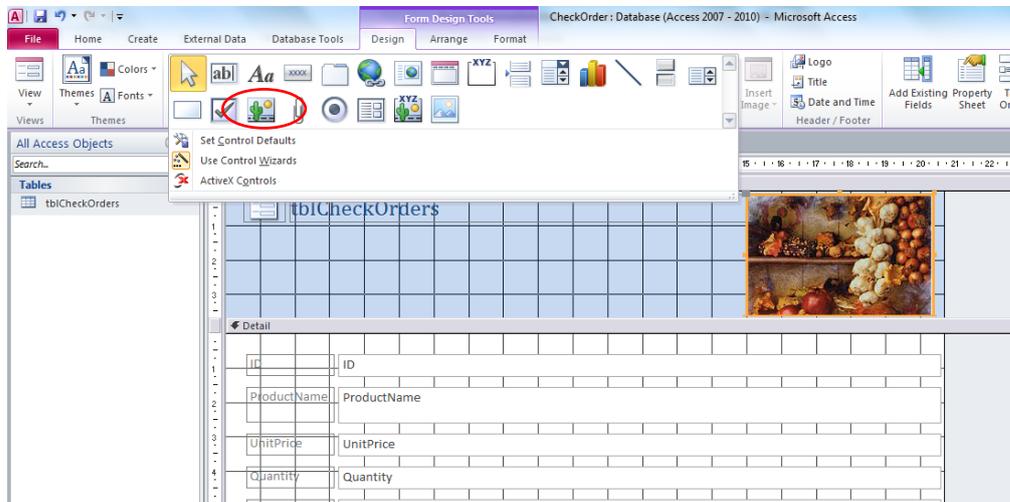
**Unbound Controls** These controls are not linked to any field in a table or a query. They are used to enhance the appearance of a form or to display information that isn't linked to any field in a table or a query. Graphics are unbound controls because they aren't linked to any table or query.

**Bound Controls** These controls are linked to a field in a table or a query. They are used to display a field value, to accept a value in a field in a table or a query, or to modify the value of a field in a table or a query.

**Calculated Controls** These are used to display a calculated value based on one or more fields in a table or a query.

## Image controls & unbound object frame controls

Click the Unbound object frame control to add an image to the form header. Click Browse and choose the Outlander logo.



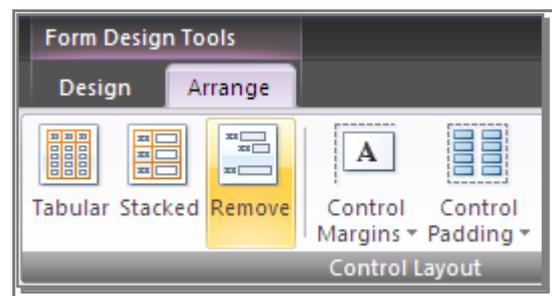
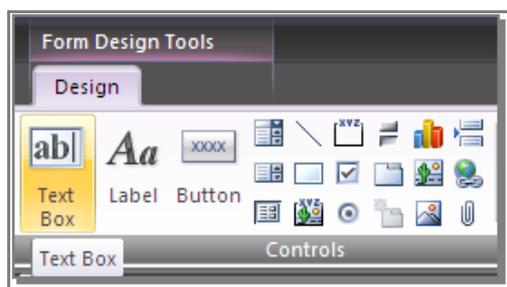
## Adding calculations in a form

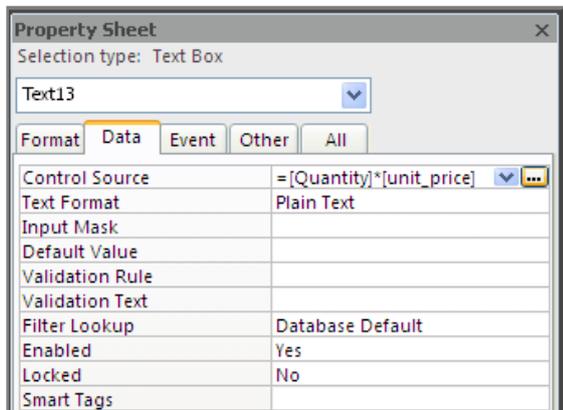
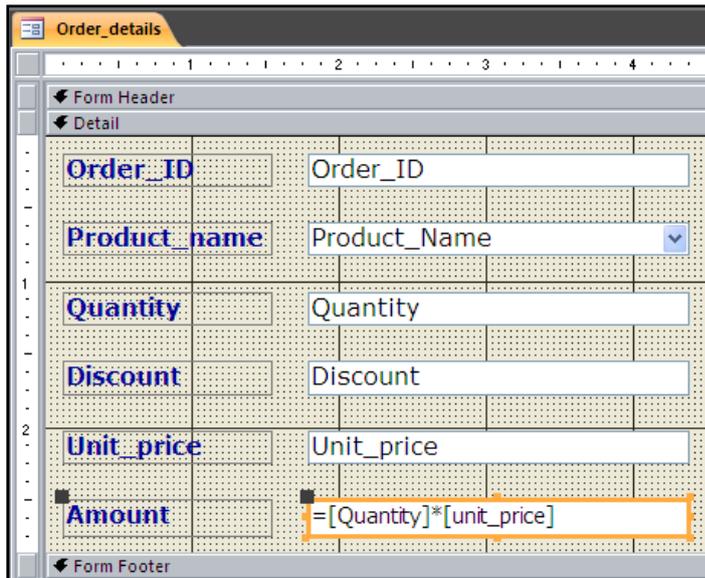
Use the ab Text box control to create a calculated field.

Type Amount as the label

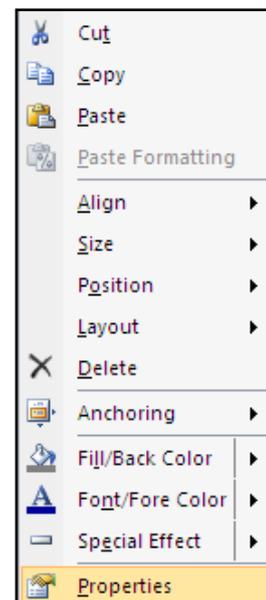
**=[Quantity]\*[Unit\_price] in the text box.**

Creating a calculated control in a form, use the Arrange tab to align boxes.



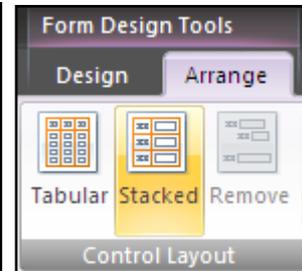
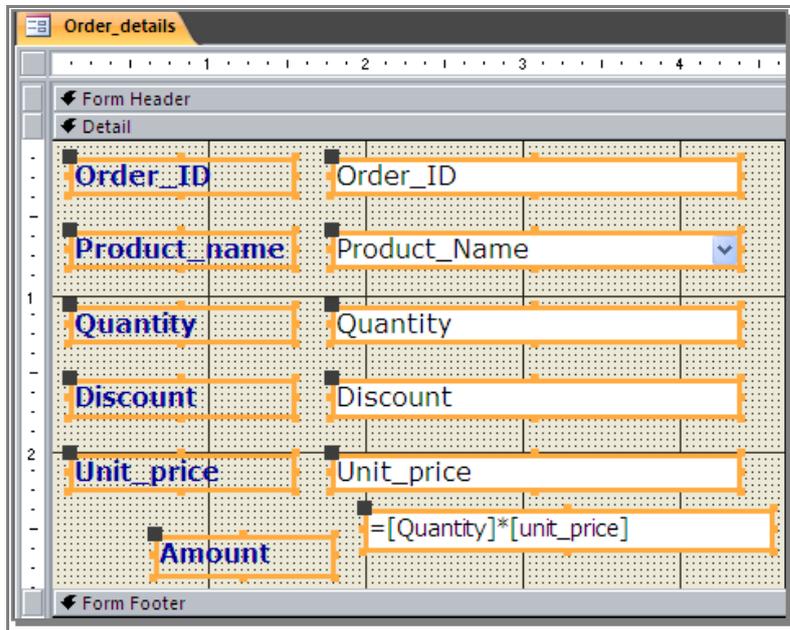


Right-click on field box and tab



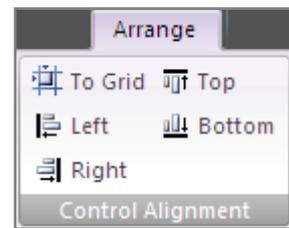
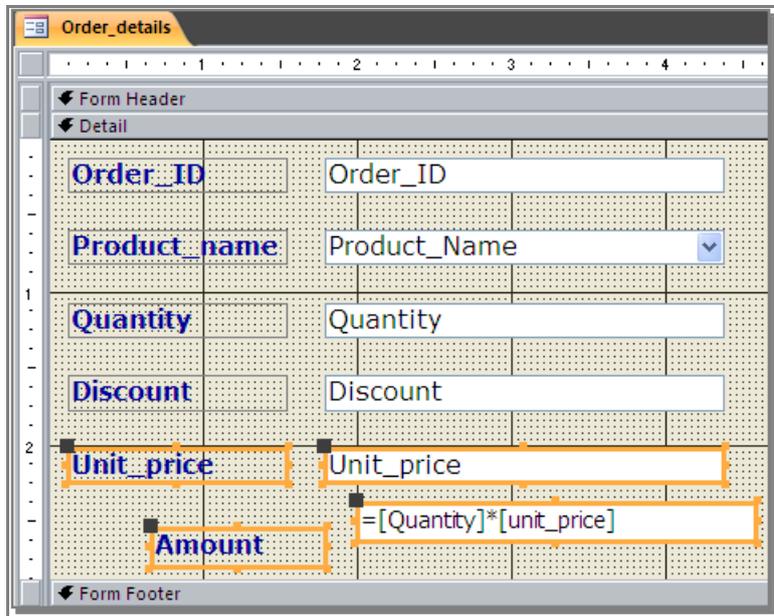
## Aligning controls in a form

Select all the controls (CTRL + A), choose **Stacked**.

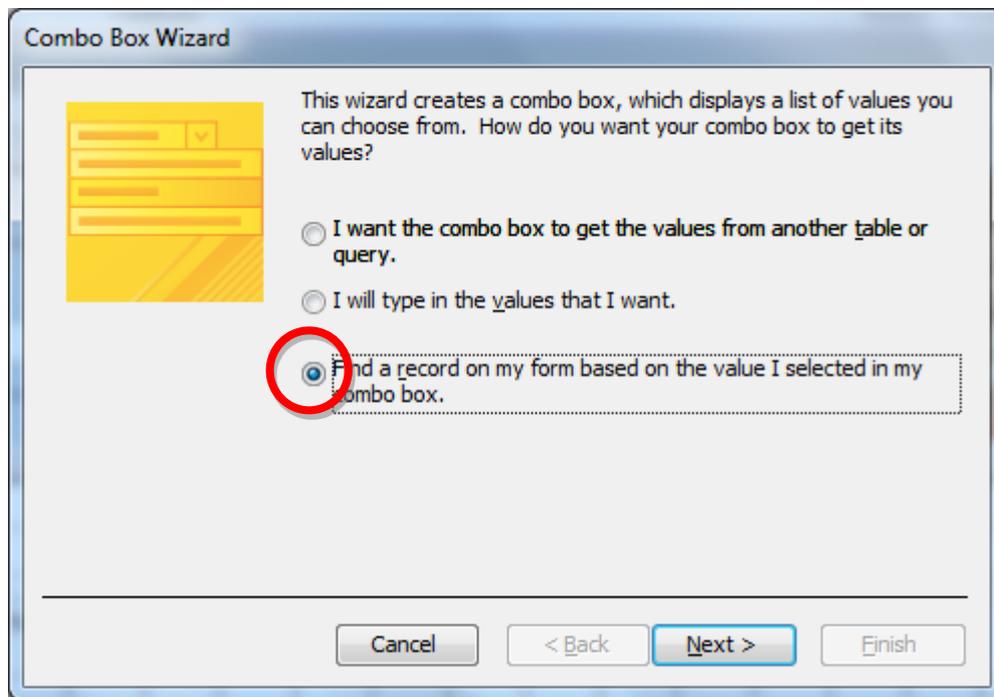


OR

Select controls individually (SHIFT + Click), choose appropriate alignment.



## Adding a combo box to search records



The combo box control offers a third option to search for data within a field. For example, use this option to create search box for the OrderID.

tblCheckOrders

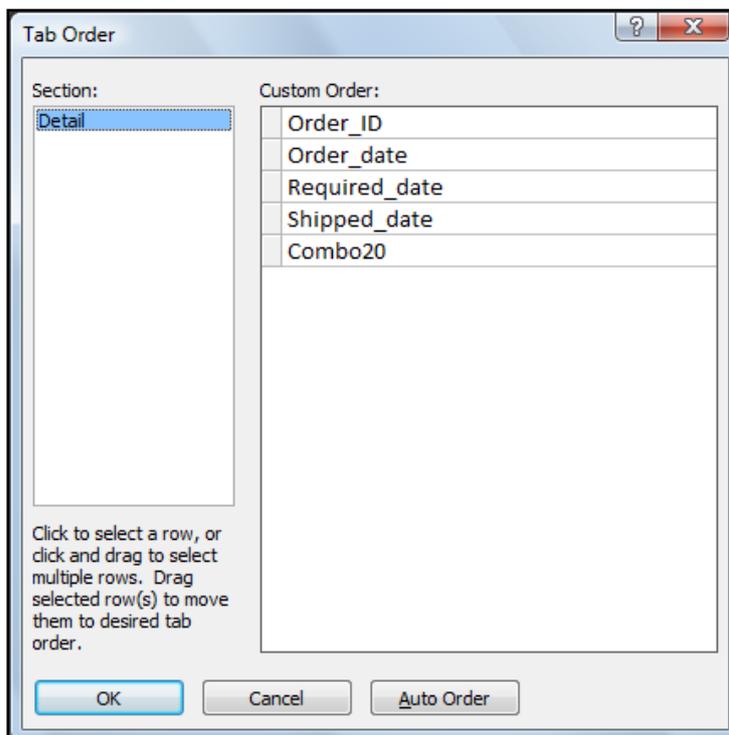
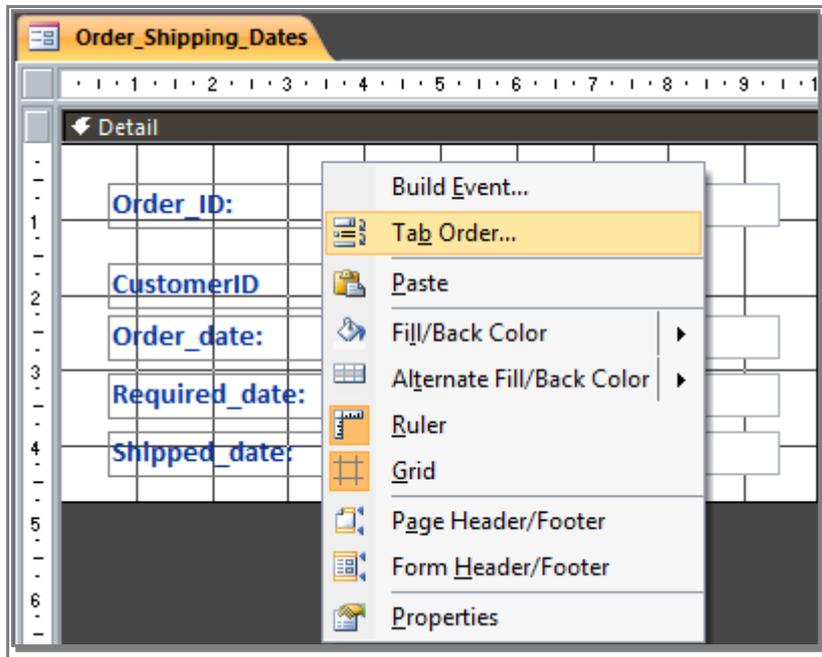
Find OrderID

ID	<input type="text" value="1"/>	Ordered	<input type="text" value="27/03/1996"/>
ProductName	<input type="text" value="Mozzarella di Giovanni"/>	Required	<input type="text" value="24/04/1996"/>
UnitPrice	<input type="text" value="34.80"/>	Sent	<input type="text" value="08/04/1996"/>
Quantity	<input type="text" value="5"/>	Delivery	<input type="text" value="7.50"/>
Discount	<input type="text" value="0%"/>	OrderID	<input type="text" value="10248"/>
Total	<input type="text" value="174.00"/>	Customer	<input type="text" value="VINET"/>

## Tab order

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This is the order in which controls receive focus as the user presses the tab key



# Unit 7: Use advanced report features

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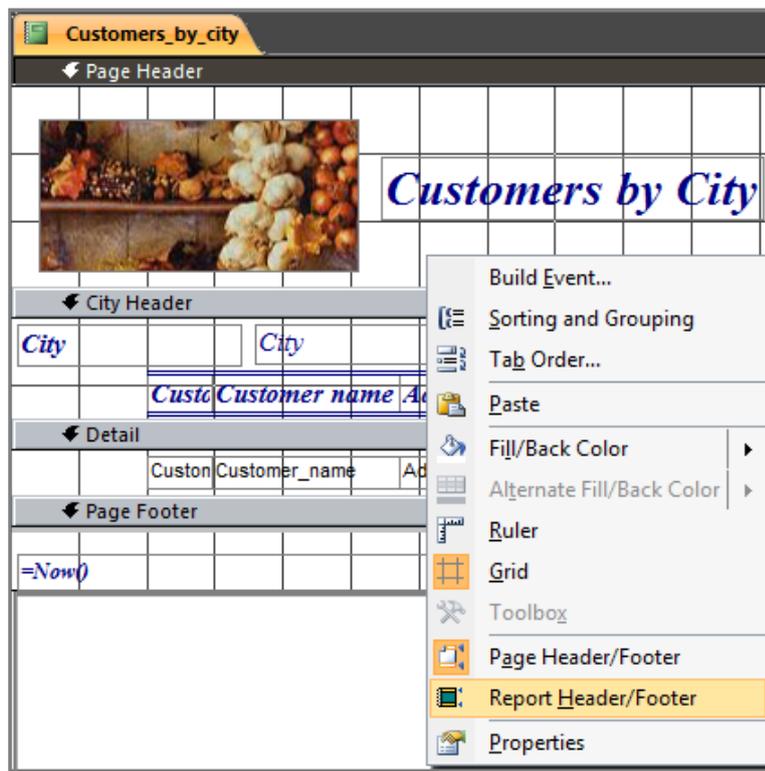
## In this unit you will learn how to:

- Customize headers and footers
- Set properties to group data
- Use functions and calculated fields in reports
- Embed a sub-report in a main report

## Creating customised headers and footers

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### Report Header



## Report Footer

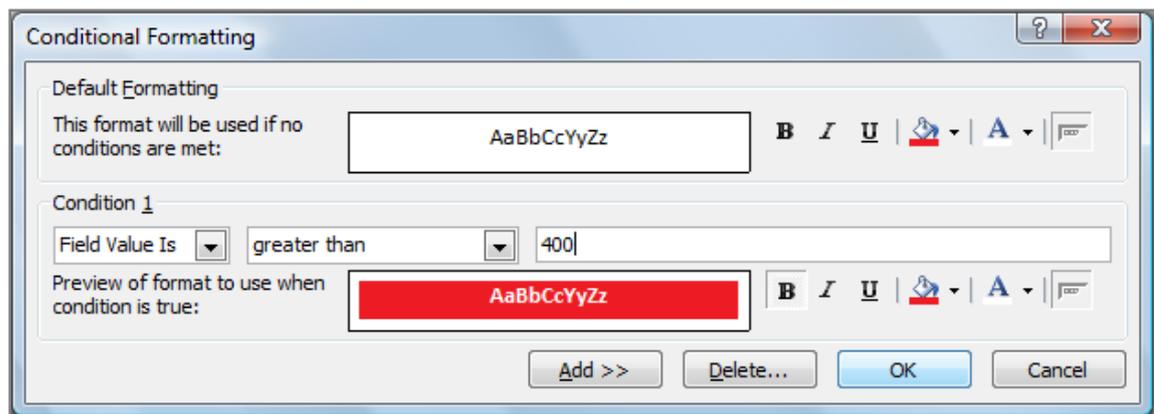
Report Footer					
		<i>Amount</i>		=Sum([Amount])	



## Conditional Formatting

Attention can be drawn to specific data in a report by using conditional formatting. This feature only applies formatting to the value of a field if a specified criterion is met.

<i>Chinese Star Anise (Whole)</i>	19	\$125.00
<i>Chives</i>	20	\$300.00
<i>Cilantro Flakes</i>	12	\$400.00
<i>Cilantro Flakes</i>	16	\$800.00
<i>Cilantro Flakes</i>	22	\$400.00
<b><i>Amount</i></b>		<b>\$7,115.00</b>

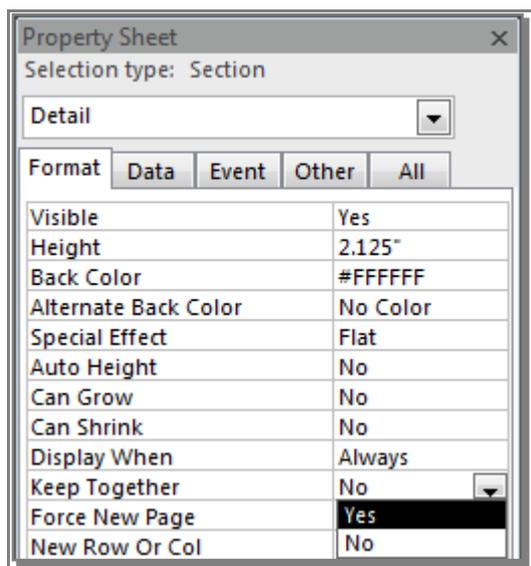
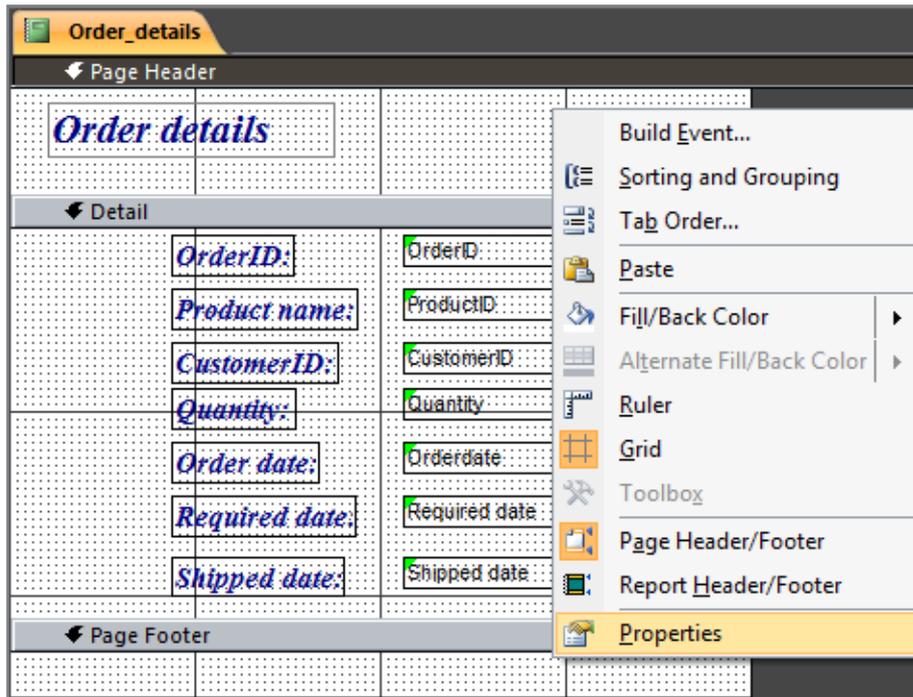


## Set properties to group data

---

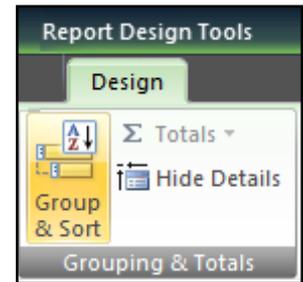
### Keep together property

This can be used to ensure that a complete section of a report is always printed on the same page.



## Group Footers

When reports are grouped based on a given field you can use the group footer section to add information particular to that group, such as the group total for example.



The screenshot displays the Microsoft Access Report Design View for a report named 'Orders'. The report is structured as follows:

- Report Header:** Contains the title 'Orders'.
- Page Header:** Contains the fields 'Productname', 'OrderID', and 'Amount'.
- Product\_name Header:** Contains the field 'Product\_name'.
- Detail:** Contains the fields 'Product\_name', 'Order\_ID', and 'Amount'.
- Product\_name Footer:** (Empty)
- Page Footer:** Contains the page number and total pages: `=Page & [Page] & of [Pages]`.
- Report Footer:** Contains the total amount: `=Sum([Amount])`.

The 'Group, Sort, and Total' task pane is open at the bottom, showing the following configuration for the 'Product\_name' group:

- Group on **Product\_name** with A on top, by entire value, with no totals.
- with title *click to add*, with a header section, with a footer section.
- keep whole group together on one page, Less than one page.
- with a footer section without a footer section.
- Sort by **Order\_ID**.
- Buttons: Add a group, Add a sort.

## Forcing a new page

The screenshot shows a Microsoft Access form titled "Order\_details" with a "Detail" section. The form contains several fields: OrderID, Product name, CustomerID, Quantity, Order date, Required date, and Shipped date. A context menu is open over the form, and the "Properties" option is selected. The "Property Sheet" window is also open, showing the "Detail" section selected. The "Force New Page" property is set to "None", and its dropdown menu is open, showing the following options: "None", "Before Section", "After Section", and "Before & After".

Property	Value
Visible	Yes
Height	2.125"
Back Color	#FFFFFF
Alternate Back Color	No Color
Special Effect	Flat
Auto Height	No
Can Grow	No
Can Shrink	No
Display When	Always
Keep Together	No
Force New Page	None
New Row Or Col	None

## Hide duplicate property



The screenshot shows an Access report named 'Orders' in Design View. The report has a grid layout with sections: Report Header, Page Header, Product\_name Header, Detail, Product\_name Footer, Page Footer, and Report Footer. The 'Detail' section contains three columns: 'Product\_name', 'Order\_ID', and 'Amount'. The 'Product\_name' field is selected, and the 'Property Sheet' task pane is open. The 'Hide Duplicates' property is set to 'Yes'.

Property	Value
Gridline Width Bottom	1 pt
Gridline Width Left	1 pt
Gridline Width Right	1 pt
Top Margin	0"
Bottom Margin	0"
Left Margin	0"
Right Margin	0"
Top Padding	0.0208"
Bottom Padding	0.0208"
Left Padding	0.0208"
Right Padding	0.0208"
Hide Duplicates	Yes
Can Grow	Yes
Can Shrink	No
Display When	Always
Reading Order	Context
Scroll Bar Align	System
Numeral Shapes	System

## Use functions and calculated fields in reports

DateDiff function

DateDiff("interval", [date1],[date2])

For interval – **y** for difference between years.

**m** for difference between months.

**d** for difference between days.

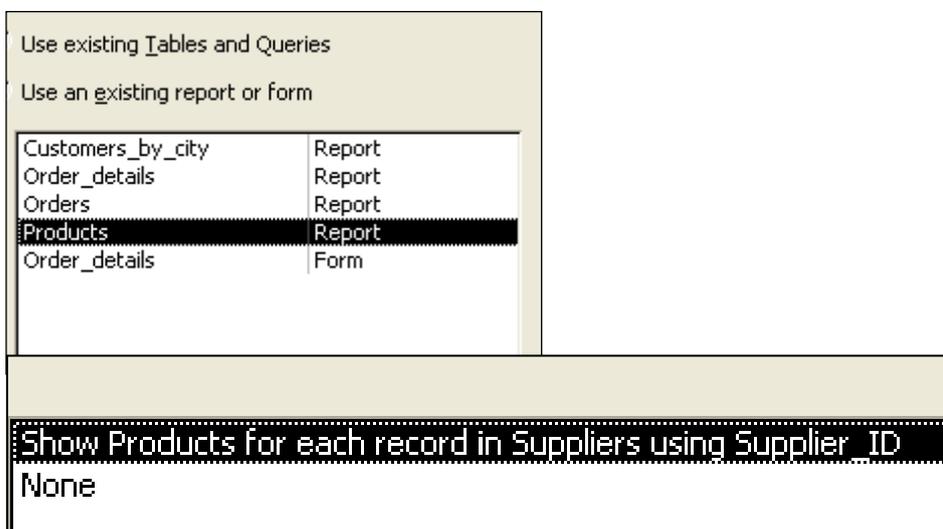
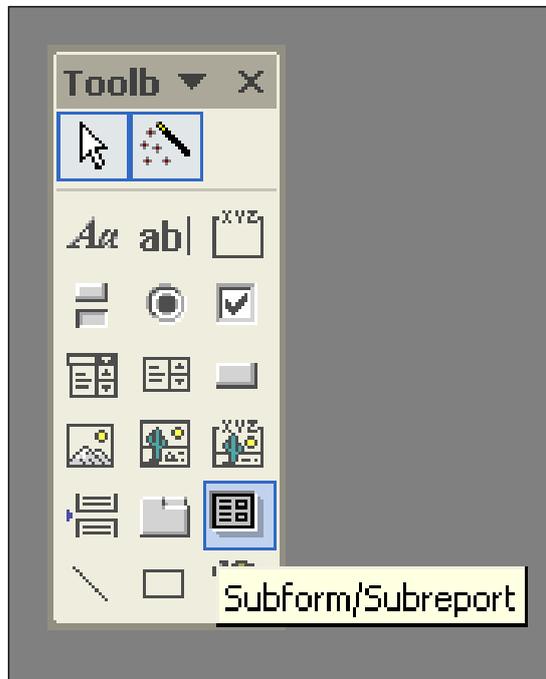
IIF function

IIF( condition, value if true, value if false)

## Working with SubReports

You can use a SubReport to display data from two reports.

Embedding a SubReport



## Example Report

Create the following report using the Orderingdb database. Use the Report wizard and base the report on all fields from qryOrdersByEmployee.

The screenshot shows a report window titled 'qryOrdersByEmployee'. The report content is as follows:

Employee Sales				
FullName	ProductName	Quantity	UnitCost	TotalCost
<i>Ben Grey</i>				
	Blank CD's (10)	500	£5.95	£2,975.00
	Binders	100	£3.99	£399.00
	Cufflinks	100	£45.99	£4,599.00
	Alarm Clock	50	£12.99	£649.50
	Vacuum Cleaner	10	£111.50	£1,115.00
	Alarm Clock	10	£12.99	£129.90
	Toaster	15	£45.99	£689.85
	Iron	25	£29.50	£737.50
	Binders	100	£3.99	£399.00
	Toaster	50	£45.99	£2,299.50
	Alarm Clock	50	£12.99	£649.50
		Total Sold By Employee		£14,642.75
<i>Bepe Hamsen</i>				
	Paper Ream	100	£4.98	£498.00
	Erasers (25)	500	£2.99	£1,495.00

The report is grouped by FullName and there is a summary total for the TotalCost field.

From the report properties record source add a parameter that asks to enter an employee Fullname when the report is opened. (Pressing enter should show all employees). Use:

**Like [Enter employee fullname]& ""**

Calculate a bonus award of £1000 if the Total sales for an employee is greater than £40,000.

**Hint:** Use the Ab tool and create a calculated field and including the IIFfunction.

The screenshot shows a report window with the following data:

FullName	ProductName	Quantity	UnitCost	TotalCost
<i>Charles Goodwin</i>				
	Vacuum Cleaner	10	£111.50	£1,115.00
	Iron	50	£29.50	£1,475.00
	Radio	100	£65.95	£6,595.00
	Thermos Risk	50	£8.95	£447.50
	Toaster	50	£45.99	£2,299.50
	Cufflinks	10	£45.99	£459.90
	Vacuum Cleaner	25	£111.50	£2,787.50
	Printer Cartridge	100	£4.99	£499.00
	Radio	50	£65.95	£3,297.50
	Toaster	20	£45.99	£919.80
	Alarm Clock	100	£12.99	£1,299.00
	Radio	100	£65.95	£6,595.00
	Thermos Risk	500	£8.95	£4,475.00
	MP3 Player	5	£125.95	£629.75
	Toaster	50	£45.99	£2,299.50
	Vacuum Cleaner	100	£111.50	£11,150.00
	Iron	50	£29.50	£1,475.00
		Total Sold By Employee		£47,818.95
		Bonus awarded		£1,000.00
<i>Henri Darcine</i>				
	Tin	50	£13.96	£698.00

# Unit 8: Importing, Exporting and Linking Objects

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## In this unit you will learn how to:

- Importing from Excel
- Importing Objects from Access
- Exporting Objects to Access
- Linking Access Tables

## Importing from Excel

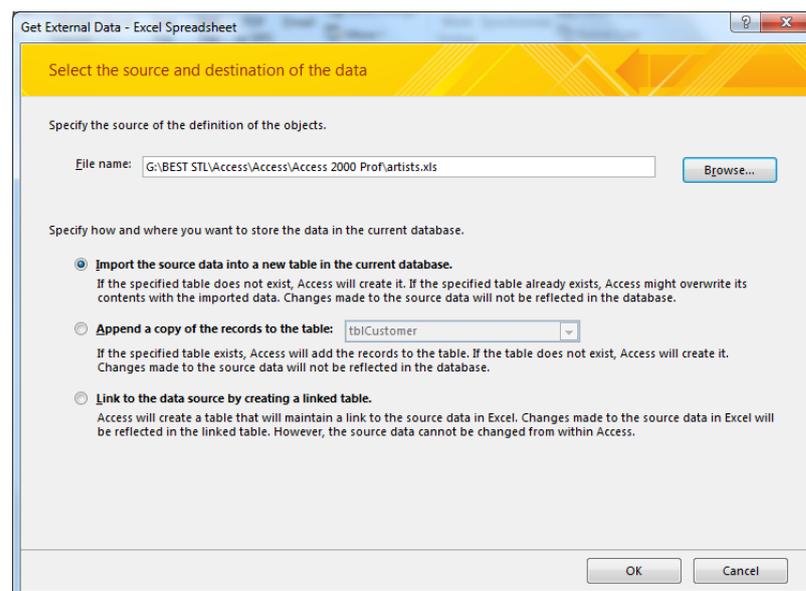
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Instead of creating tables from scratch you may want to import already existing data in Excel into your Access database.

To import all of the data from a worksheet ensure the first row of the data contains unique column headings.

Then in your database select External Data.

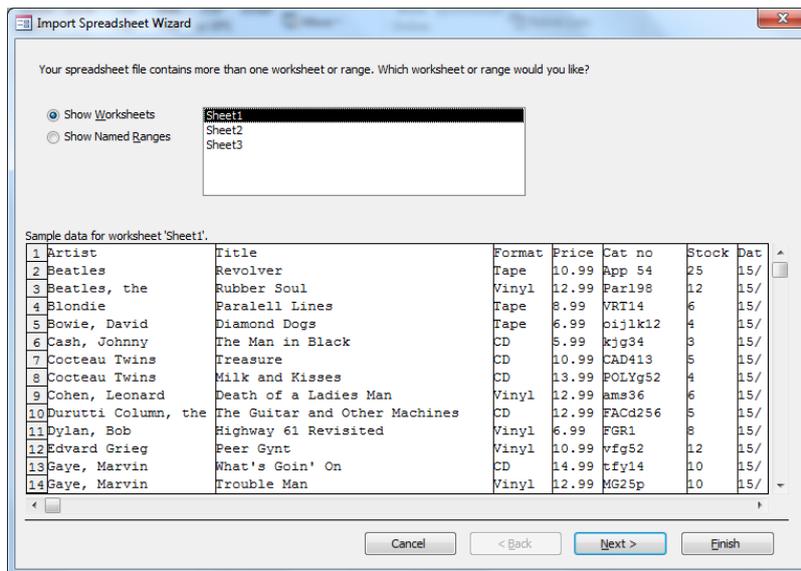
In the Import & Link group of the ribbon choose Excel.



Click the Browse button and select the Excel workbook to import.

On the next screen choose the sheet that contains the data.

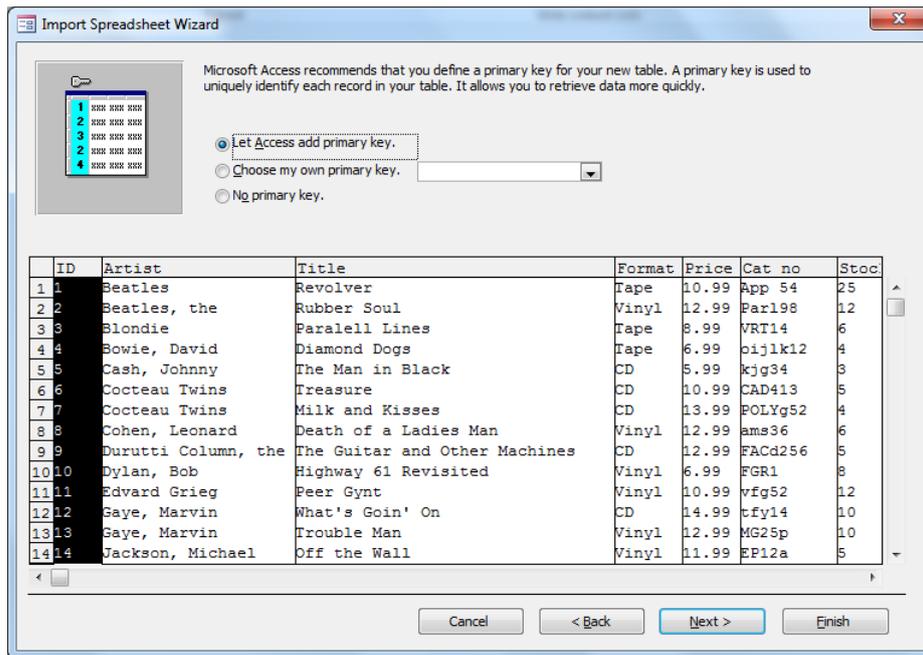
Note that if you want to import a selection of records than all the Excel data create a Named Range first in Excel for the records required.



On the next screen ensure First Row contains Field Headings is selected

On the next screen you have the option to format columns or even not include a column in the imported table.

The next screen allows you to choose a Primary Key, let Access create one or choose not to have one for the imported table.



Finally name the imported table (Artists)

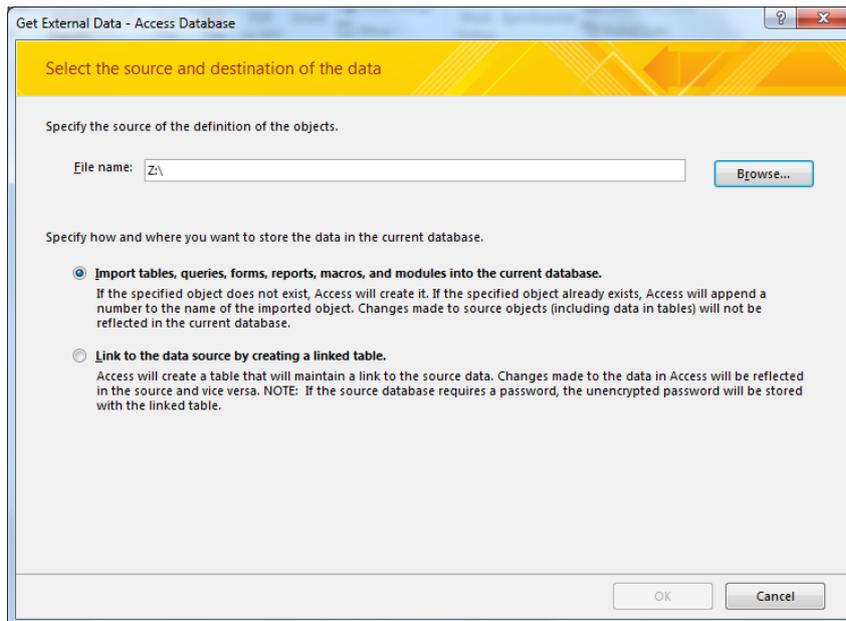
You now have a new table withing the database.

## Importing objects from Access

When creating a database, you can import objects (tables, forms, reports, queries) from an already existing database.

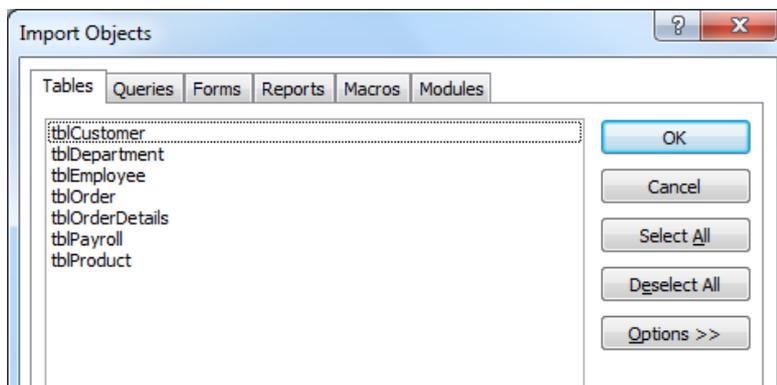
As with importing from Excel start by clicking the **External Data** tab.

Now click **Access** from the Import & Link group.



Choose the first option then click Browse to select the Access database from which you want to import objects.

Press OK then you can choose the tables to import.



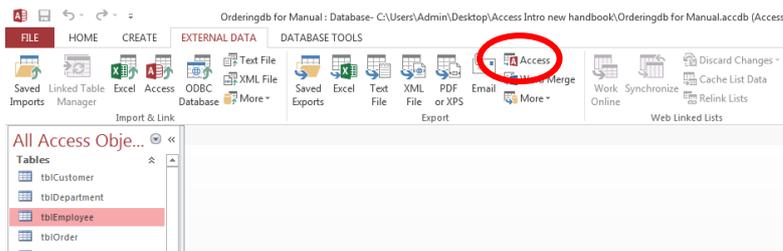
If you want to import other objects click and select them from the other tabs before pressing OK.

Use the Ctrl key for multiple selection.

Now click OK and all the objects selected will now be imported into the current database.

## Exporting objects to Access

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You may wish to export a table or another object to either an Access database or to Excel.

To do this:

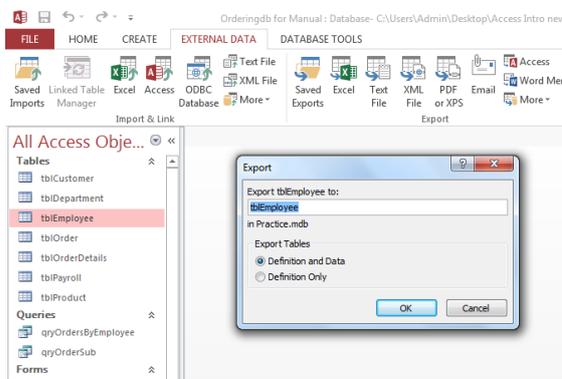
Select the table (or other object) from the Navigation pane.

Choose **External Data**, then choose **Access** from the Export group.

Click Browse then select the Access file to export into

Press Save.

On the next screen choose whether to export the whole table or just the table definition.



Click OK and then the Close button.

Repeat the process to export other object.

To Export to Excel do the same but choose **External Data, Excel** from the Export group.

## Linking Access Tables

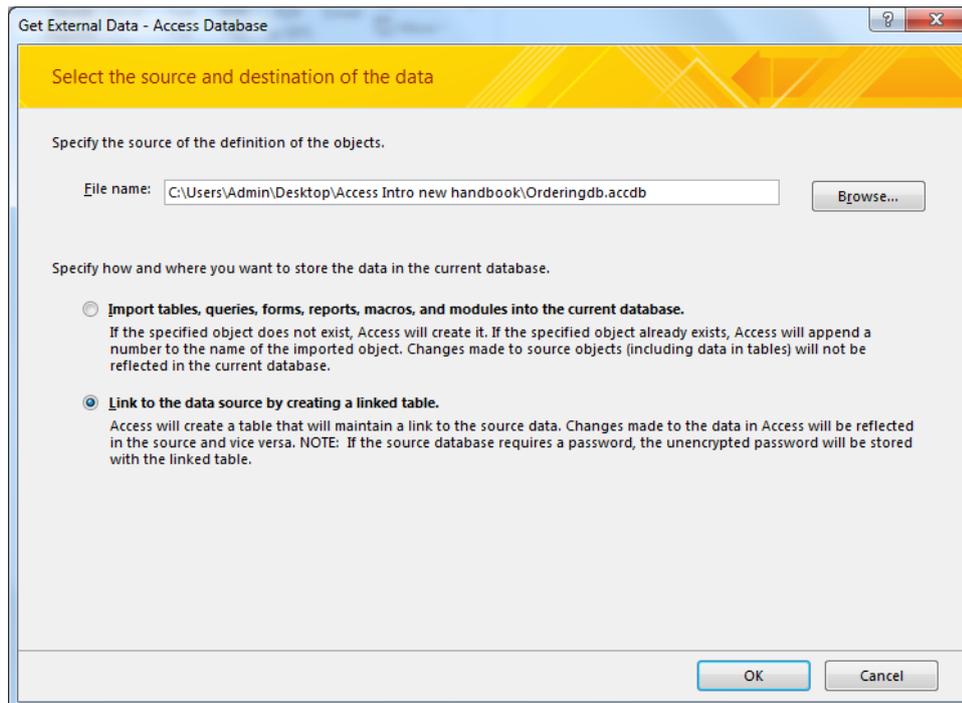
As well as importing and exporting object Access allows you to link to a table in another database (or to a sheet of an Excel workbook). This can be advantageous

when many users wish to use the same data but to create their own reports, queries and forms.

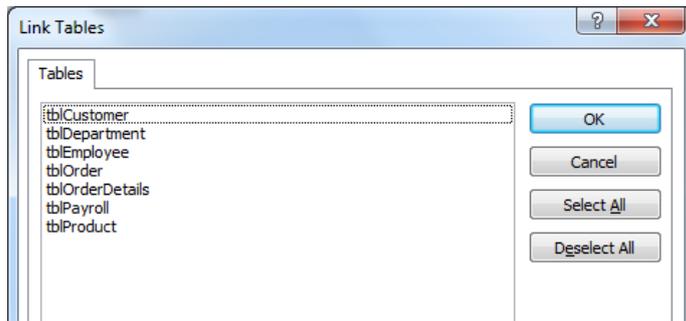
To link to a table of another database select the External Data tab

Choose Access from the Import & Link group

Select the second option – Link to data source by creating a linked table.

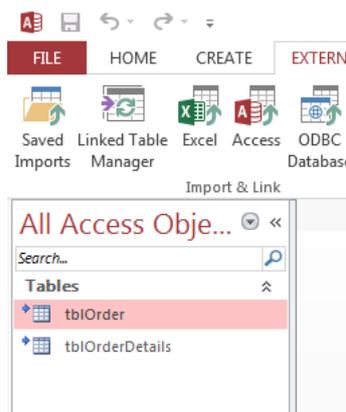


Click Browse to choose the database to link to, then OK.



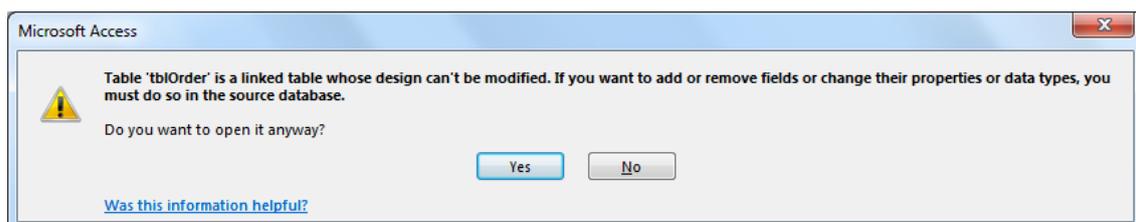
Now choose the table or tables to link to and press OK.

Note that linked tables display a small blue arrow next to the table icon in the Navigation pane.



When you open a linked table the data displayed is coming from the other database. Any data added or deleted will be added or deleted in the table of the source database.

However you cannot make changes to the table design.



Changes to the table design must be made by opening the source table.

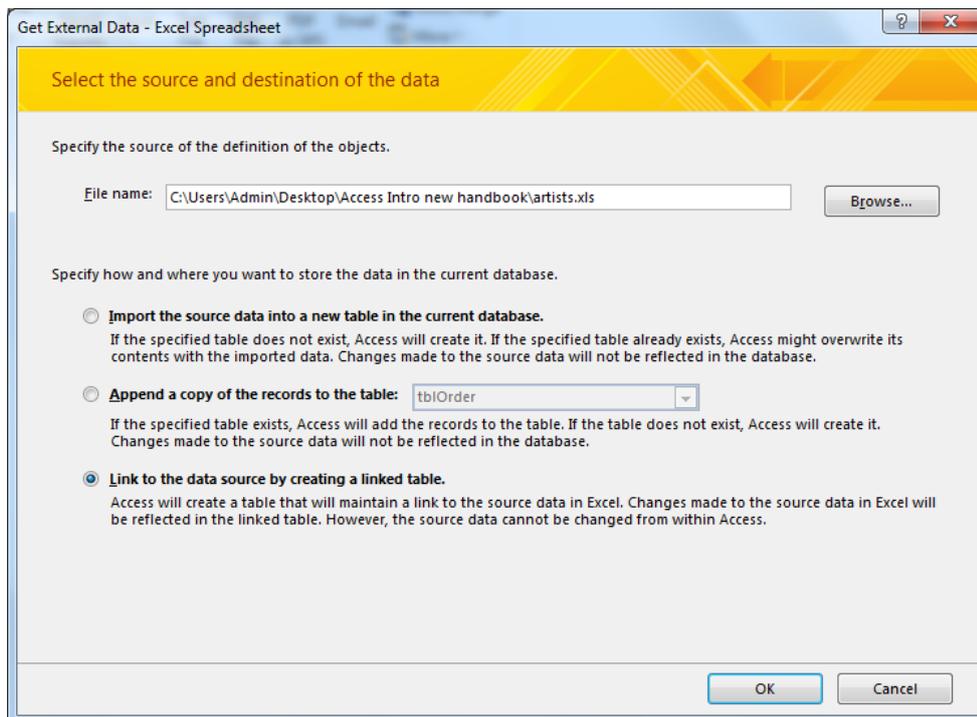
## Linking to Excel

In a similar way you can link to a worksheet in an Excel workbook.

Choose **External Data**

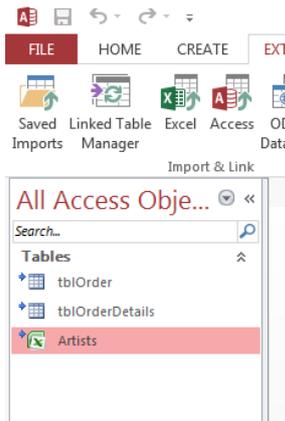
Click **Excel** from the Import & Link group

Choose **Link to data source by creating a linked table.**



**Hint:** Click Append data to an existing table if you want to copy and append data instead of linking it.

Browse and select the Excel file and choose the worksheet to link to.



Unlike with linking to an Access table, when linking to Excel changes cannot be made to data.

You must open the source Excel worksheet to make changes to data or to its design.

## Linked Table Manger

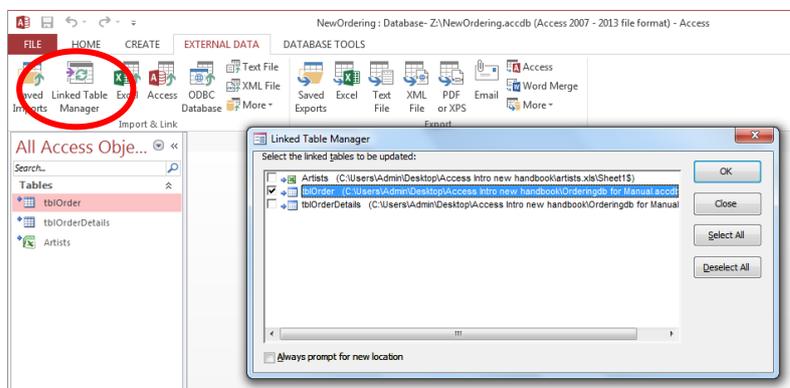
---

Changes to data are will normally update automatically.

Use the Linked Table Manager if locations to tables have been changed and to view all the linked tables at once.

Select External Data

Linked Table Manager.



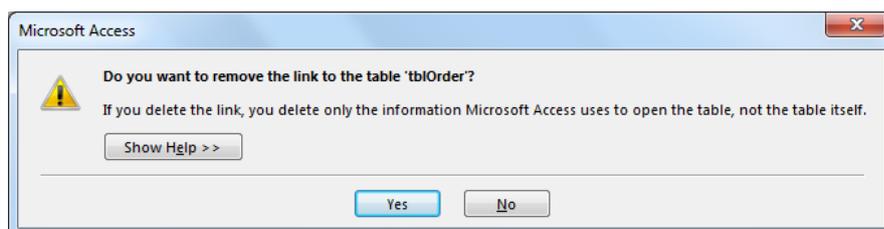
Click OK to update a link location of a selected table.

## Breaking a link

If you no longer need to link to a table then:

Right click the linked table in the Navigation pane

Select **Delete**



The dialog confirms that the link is being deleted and not the actual data in the source table.

## Quick Reference: Access Shortcuts

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Command	Keystroke
Add new record	Ctrl +
Builder	Ctrl-F2
Check/uncheck box or option button	spacebar
Close	Ctrl-W
Copy	Ctrl-C
Cut	Ctrl-X
Cut current line and copy to Clipboard	Ctrl-Y
Cycle through sections	F6/Shift-F6
Cycle through tab of each object's type (toggle)	Ctrl-Tab/Shift-Ctrl-Tab
Database window	F11
Delete current record	Ctrl -
Edit/Navigation mode (toggle)	F2

<b>Command</b>	<b>Keystroke</b>
Exit subform and move to next/previous field in next record	Ctrl-Tab/Shift-Tab
Extend selection to next/previous record	Shift-Down/Up
File/Save As	F12
Find	Ctrl-F
Find Next	Shift-F4
Find Previous	Shift-F3
GoTo	Ctrl-G
Insert current date	Ctrl ;
Insert current time	Ctrl :
Insert default value	Ctrl-Alt-spacebar
Insert new line	Ctrl-Enter
Insert value from same field in previous record	Ctrl '
Menu bar	F10
Move to beginning/end of multiple-line field	Ctrl-Home/End
Move to current field in first/last record (Navigation mode)	Ctrl-Up/Down
Move to first field in first record (Navigation mode)	Ctrl-Home
Move to first/last field in current record (Navigation mode)	Home/End
Move to last field in last record (Navigation mode)	Ctrl-End
Move to left edge of page	Home or Ctrl-Left
Move to page number/record number box	F5
Move to right edge of page	End or Ctrl-Right
Next window	Ctrl-F6
Open combo box	F4
Open in Design view	Ctrl-Enter

<b>Command</b>	<b>Keystroke</b>
Paste	Ctrl-V
Print	Ctrl-P
Property sheet	Alt-Enter
Refresh combo box	F9
Replace	Ctrl-H
Requery underlying tables in subform	Shift-F9
Save current record	Shift-Enter
Screen left/right	Ctrl-PgUp/PgDn
Select/unselect column (Navigation mode)	Ctrl-spacebar
Switch to Form view	F5
Turn on Move mode	Ctrl-F8
Undo	Ctrl-Z
Undo previous extension	Shift-F8
Zoom box	Shift-F2

## E&OE

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