



*Making IT happen with*

# MS ACCESS

*(Access 97, 2000, 2002, 2003)*

*Key concepts*

*Creating a database*

*Entering data*

*Using Forms*

*Finding and sorting data*

*Filters and Queries*

*Formatting and printing*

*Creating Reports*

*Importing data*

*Exporting data*

*Relating tables*

*Tips & traps*

*ECDL cross-  
reference*

This document is written both for newcomers to Access, and for those who are already familiar with the basics. Some experience of Windows and Microsoft Word is assumed.

The original version of this document was written for staff and students working on the networked PCs at Sheffield Hallam University. **Organisations wishing to modify and distribute this document should first obtain permission from Paul Buckley, Head of Academic IT Services, LITS, (e-mail [p.n.buckley@shu.ac.uk](mailto:p.n.buckley@shu.ac.uk))**

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With thanks to Julia Bates, Dave Jefferies, Barry Knaggs. Screen shots reprinted by permission from Microsoft Corporation.

# Introduction

●\* **Jargon: database**  
Simply a collection of information. This could be a list of addresses, catalogue of products, medical records ...

- ☑ ***This document was written to be used as a printed booklet. You are strongly recommended to refer to a paper copy, rather than trying to learn the features described while you are reading it online.***

Access is designed for work which involves manipulating and sorting data records of any kind. You can create **queries** to sort and filter your data, and use **reports** to produce attractive, formatted printouts. You can set up **forms** to make data entry more "user-friendly", and include checks to validate the data as it's entered.

Data in one Access table can be *linked* with data in another. This is what *relational database management* means. If two tables of data have a **common field** – a shared item of information – you can hook them together, then query and report on them in combination.

You can **import** and **export** data tables between Access and older standard database software, such as dBASE; spreadsheet software, including Excel and Lotus 1-2-3; and html (Web page) format.

**This document sets out to provide the information which is most commonly needed by people who are using Access in an academic or office context.** It assumes that you are familiar with the Windows interface, and with basics such as opening and saving files. You'll find it much easier to learn Access if you are acquainted with using Word before moving on to spreadsheet work. Microsoft have designed all the Office applications so that they are as similar as possible. Common menu items will be found in the same place; text and data are for the most part edited, cut and pasted in the same way.

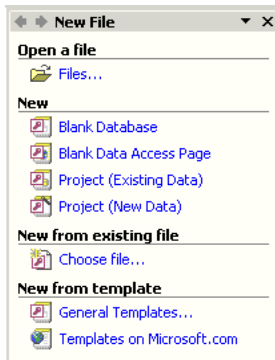
These instructions are based on the Access 2002 user interface. Access 2003 is identical as far as the features described here are concerned. If you have an earlier version, for most purposes there are no compelling reasons to upgrade to Access 2003 if you already have Access 97, 2000 or 2002 on your home computer.

Where things are different in the Access 97 and 2002/3 versions, this is flagged in the course of the document. Margin notes are used to highlight significant Access 97 differences. Access 2000 is like 97 in some respects and like 2002 in others.

- ☑ **Transferring files between different versions of Access:** Access 2000/2002/2003 are set by default to use the Access 2000 file format. If this setting has been changed, before you copy your file for transfer, you will need to use the **Convert Database utility**, available from Tools | Utilities in the Access menu. Conversion to Access 2000 format creates a file which will open in all versions from 2000-2003. There is also an Access 97 format option available. See page 31.

# Basic operations and concepts

The Task Pane (illustrated below) was a much-proclaimed new feature in Office 2002 software. But in Access, it doesn't figure prominently once you have a database file open.



## ● Load Access.

Your first step when Access has loaded is either to **open** an existing database, or create a **new** one. In Access 2002/3, this is done from the **Task Pane** on the right of the screen.

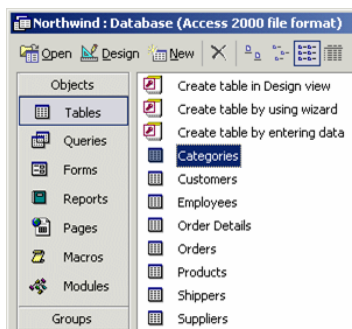
Access provides some excellent sample databases: in combination with on-line help, these provide a good way of getting a feel for what Access can do. The **Northwind** sample database is especially popular - it has been available in all versions of Access from 97 onwards.

- Access 2002/3: from the **Help** menu, select **Sample Databases**, then **Northwind Sample Database**. If the file can't be found, you may need to return to your installation CD to install the sample database. In all versions of Access from 97-2003, the default file location of the Northwind database is C:\Program Files\Microsoft Office\Office\Samples. Copy Northwind.mdb to another location before you modify it in any way, so the original remains unaltered. (*Note*: be sure the file you copy is Northwind.**mdb** – not Northwind.adp.)
- If you're using the Northwind sample and a *main switchboard* window opens, click the **X** in the top right corner of this window to close it - the database itself will stay open.

Once you've opened a database, take a look at the **menu** and **toolbar**.



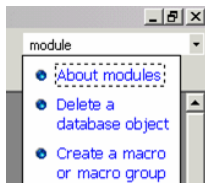
These are *context-sensitive* – what's available changes depending on what you are currently doing. If a tool or menu option is greyed-out, it's because you haven't yet done anything which might require its use.



- Move the cursor *slowly* over the toolbar icons. Whether or not they're greyed-out, a **tool tips** box pops up to describe the function of the tool which the cursor is currently resting on.
- Now look at the **database window**. This is your Access “database control centre”.
- Open and explore some of the tables, queries, forms and reports in the Northwind database.
- Press **F11** to return quickly from whatever you're doing to the Database Window.
- *On your own computer*, you can customise the toolbar to include the menu items you use most commonly. To find out how, look up *toolbar* in Access online help.

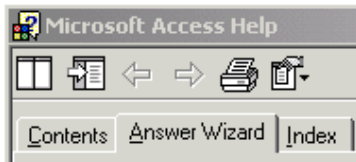
## Using Access online help

Access 2002/2003 has an **Ask a Question** box top right of the screen.



1. Type a question - or just a keyword - into the box, then press **enter**. A list of topics will appear.
2. Select a topic, and the **Access Help window** will open, with information on the selected topic displayed. Click on any blue text for more information about that sub-topic.

In earlier versions of Access, use the Help menu to access this window.

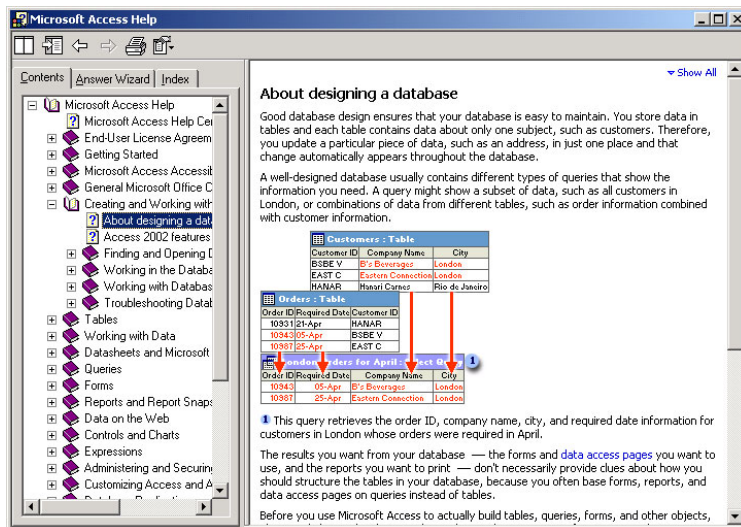


3. Notice the **tabs** at the top left of the Help window. **Answer Wizard** and **Index** provide two different ways in to the same help which is available from the Ask a Question box.

Generally, it's quickest to use the Index if you're familiar with Access terminology, whilst the Answer Wizard is more likely

to locate the help you need when you don't know the jargon.

4. **Contents Help** can be useful if you want tutorial-type help on a specific topic. Click the Contents tab, then click the + icon to expand the Contents list. The example page illustrated - *About Designing a Database* - provides a valuable introduction to general principles.



## Managing your work

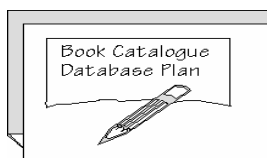
- An Access database is a *single file* which can contain a *set* of database tables, as well as all the related queries, forms and reports.**
- Access will not perform well if you work straight from a floppy disk, or from a USB storage device with only limited space available.** On centrally-administered networked computers, it's generally best to work from your network homepage.
- Make regular backup copies of important files.** Access databases do sometimes become unnecessarily large, and occasionally corrupt - you should be aware of the utility which is available for compacting and repairing them. See page 36.

# Creating a Database

Before you start entering data into an Access database, you need to:

1. **Plan** your database structure on paper.
2. **Create** a new Access database file, name and save it.
3. Create your table or tables, name and save them.
4. **Test** your table structure with some sample data, and **modify** the structure as required.

## Planning your Database



- ✓ **Tables are the one essential ingredient of a database: you can't create queries, forms or reports until you have a table or set of tables to work with.**
- ✓ **Think and plan before you go any further. All good database designers work out their database structure with a pencil and paper first.**

You may already have some data in mind which you want to use. If not, follow the Book Catalogue example which is used here.

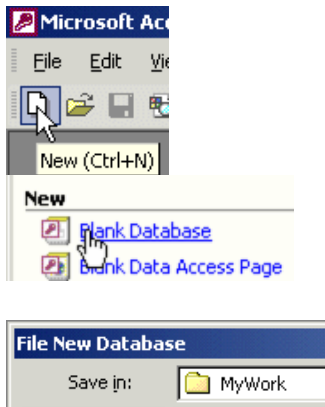
Your task at this stage is to decide on what the different **data items** are, and allocate each of them a **field** or column in the table. Initially our example database will include just one table – a booklist containing author, title, publisher, publication date and summary.

If you just wanted to use this database as a bibliography, the one table would be all you needed. But if you were a bookseller, at the planning stage you would decide that for ordering purposes you needed another table as well, containing publisher's addresses. Because Access is a *relational database management system*, the booklist and publisher tables can be linked to one another via the common field containing the publisher's name. The design and use of relational databases is a major topic in its own right, and this document doesn't attempt to do more than supply some initial pointers (page 34).

- ✓ **It's easy to add extra fields to a table later, if you find you've left something out. But it's much more difficult if you decide that you want to split up information you've entered in one field.**

A common example of this is when people create a database address book, and then kick themselves because they have entered Firstname and Lastname as one field, in that order - for example "John Smith". This makes it impossible to sort alphabetically by lastname. General good practice is to create separate fields for firstname and lastname. However, in our example database this would create a dilemma - some books are written by more than one author. As a working compromise, author has been kept as one field, but with lastname entered first, followed by firstname or initials as given on the book cover.

## Creating your file



1. **Close** any sample databases you have open. (From the **File** menu, select **Close**; or click the **X** in the top right corner of the database window.)
2. If the **Task Pane** (page 4) isn't visible, click on the **New** button in the **Toolbar**. The Task Pane will then appear. (Or, in Access 97/2000, the New Database window.)
3. Click **Blank Database**. (In Access 2000, just Database.) The **File New Database** window will open. You can't start working with an Access database until you have named and saved it: make sure you set **Save in** to an appropriate folder, and give your file a meaningful name. *Spaces* in filenames are best avoided. Your filename will *automatically* be given the **extension** ".MDB": if you called your file "Test", it would appear in any file listing as TEST.MDB.
4. When you have named your file, click on **Create**. An empty **database window** will appear.

In the database window, notice the various different types of *database objects* which your file could contain.

You may be surprised by the amount of time which Access takes to create this empty database file on your disk (especially if - against heartfelt recommendations - you're working straight from floppy). This is because the structure of an Access database file is highly sophisticated. It has to be capable of containing *all* the database objects - tables, queries, and so on - which you may wish to create.

## Creating a Table

You can choose from a variety of ways to create your table. The author thinks that using **Design View** is the clearest way to learn.



1. In the database window, make sure the **Tables** tab is selected.
2. Double-click **Create table in Design View**. (In Access 97/2000, click the **New** button, then select Design View.)
3. A **table design window** opens. You aren't entering your table data yet - first, you specify the table **structure**.

Field Name	Data Type	Description
Author	Text	Lastname first, then firstname or initials as given on book cover.
Title	Text	As on book cover
Publisher	Text	
Date	Number	Year when published
Summary	Memo	

At the *bottom right* of the table design window, the blue help text is worth reading.

You should have decided by now what *fields* your table is to include. The illustration shows what the top part of the design window will look like when the fields have been set up for our example table.

For each field in your table, there are three pieces of information to enter: **Field Name**, **Data Type**, and **Description**. Click with the mouse or use the tab key to move from one to the next.



## Field Name

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These can be up to 64 characters long. Names can include spaces, but these may cause problems with some kinds of advanced database work. Try to make field names meaningful *without* being too long. If a field name is much longer than the *field size* (page 11), it makes tidy screen displays and reports more difficult.

## Data Type

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You need to tell Access what *type* of data you plan to store in a particular field: for instance text, numbers and images all need to be handled by Access in different ways.

- Click in the Data Type column. Click on the **arrow button** which appears, and select from the **Data Type popup**.

The data types to choose from include all those familiar to users of other database software or earlier Access versions, plus a few more.

**Text:** the *default* – what you get if you don't change it. Maximum length is 255 characters. If you won't need to sort on the field, and it will contain more than around 80 characters, it's may be best to define it as a *Memo*.

**Memo:** this can include text entries of any length. People often want to store whole documents within a database. Using a memo field, you can only store simple, unformatted text, and you can't index or sort on the field. Formatted documents can be stored as OLE objects.

**Number:** Note that there are some occasions when numbers are better treated as text than defined with the Number data type. Use the Text data type where numbers are not to be used in any kind of calculations – for instance telephone numbers.

**Date/Time:** The Date data type *isn't* appropriate for a simple year date, such as Year of Publication in our sample table. Use it when you want to enter day-month-year, or time, in a standard format.

**Currency:** You'll automatically get figures entered in £ format if you select this data type. If you want Euros, modify field properties as described on page 11.

**AutoNumber:** Use where you want a field which automatically gives a *unique record number* to each table entry.

**Yes/No:** Use for "logical", True/False, "flag fields".

**OLE Object:** Use to store graphics, charts, formatted documents, sound files in the table. See page 36.

**Hyperlink:** Use to store links to other files or to Web pages.

**Lookup Wizard:** Use to create a field which lets you choose a value from another table, or from a list or query you've set up.

Online help contains more detailed information about the data types available in Access. Click in the Data Type column, then click **F1**.

## Field Description

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This is *optional*. Use to clarify what data is to be entered in the field.



## Saving your Table

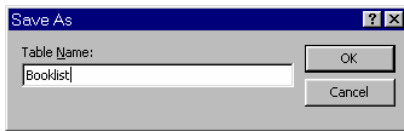
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You will be able to return to the design window if, once you've started entering data, you find you need to make changes. Before you can enter any data, you must **name** and **save** the table.



- In the **Toolbar**, click the **Save** button.

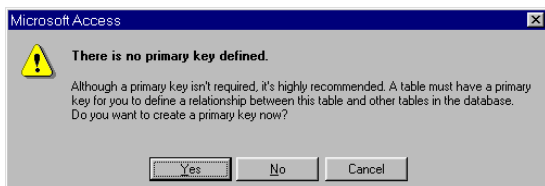
A "Save As" box will appear. The name for your table can be up to 64 characters if you want, but remember it's not a good idea to make names *too* long – it's difficult to display them in the Access database window lists. It's good practice to avoid spaces in table names – they can cause problems in some contexts.



## Primary keys

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After you have given your table a name, if you haven't defined a **primary key** an *Alert Window* will ask if you want to do so. A primary key is a field which can *uniquely identify* any record in your table. No one field in our example booklist table could act as a primary key: for instance there may be more than one book by the same author.



If you're creating a *relational* database, where data contained in different tables can be linked, a primary key is essential. Even where you aren't doing this, Access functions much better if a primary key is defined. Without one, you may find that when you return to your table after entering data, records won't be displayed in the same order as you typed them in. This can often be irritating.

To create a primary key:

- *If you're saving your table without having defined a primary key first:* click the **Yes** button when the alert window appears.

A screenshot of the table structure for 'booklist: Table'. It shows three fields: 'ID' with data type 'AutoNumber', 'Author' with data type 'Text', and 'Title' with data type 'Text'. The 'ID' field has a key symbol next to its name, indicating it is the primary key.

	Field Name	Data Type
Key	ID	AutoNumber
	Author	Text
	Title	Text

An extra field will automatically be added to your table structure. This will be called **ID**, and will use the **AutoNumber** data type. The key symbol by the field name denotes its status as primary key.



- *To create a primary key at any other stage:* give the field a name of your choice, and set Data Type to AutoNumber. Click in the button bar left of the field name to select the field row, then click the **Primary** button in the toolbar.

By default, the autonumber assigned will be 1 for the first record you type in, 2 for the next, and so on. When you view the data in your table, it will automatically be ordered by the primary key. If you delete records, remaining records *won't* be renumbered – there will just be unused numbers in the autosequence.

As long as each entry is unique, a primary key doesn't have to use the autonumber data type. If it's any other data type, you must set up an *index* on the field which prohibits duplicate values. Do this from the *Field Properties* box - page 11.

# Modifying the Table Structure

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**Always regard entering your first few data records, as testing your table out.** It's much easier to make changes early on than to be stuck with an unsatisfactory table with a lot of data in it.

You can easily shift between **datasheet** view (to enter your data) and **design** view (to modify your table structure) with the **View** button at the left of the toolbar.

- Enter a few data records now – see page 12.

## Changing the Field Order

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The order in which fields appear on screen can make a lot of difference to entering data easily and scanning records quickly. You can always change the order on the screen display or when you're creating a Query, Form or Report; but this can prove a lot of unnecessary work. In the Table Design Window, you can move any field entry to a different position using “drag and drop”:

1. Click in the **button bar** to the left of the Field Name.

The row will be highlighted and marked with an arrow.

2. Click again in the button bar, and hold down the mouse button. The cursor will change to look like the illustration.
3. **Drag** to where you want the field placed.

As you drag, the heavy black line marks where the *top* of the row you're moving will be positioned. Note: the cursor *must* look like the illustration above left, otherwise you may find yourself changing row height instead of moving the row. (If this happens, click **Undo**.)

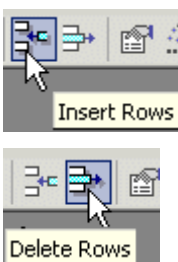


## Inserting and Deleting Fields

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- To insert a field: In Design view, click in the row *below* where you want a new field. In the Toolbar, click the **Insert Rows** button. A row will be inserted *above* the one currently selected.
- To delete a field: In Design view, click in the field you want to delete. Then click the Toolbar **Delete Rows** button.

Alternatively: right-click in the row, then select Insert Rows or Delete Rows from the popup menu.



## Renaming Fields

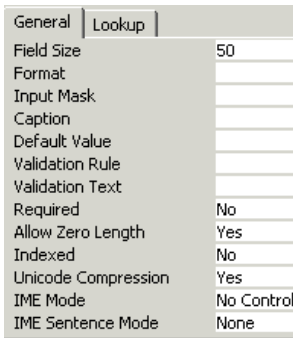
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You can simply edit any field name as you wish. If you already have data in the table, *always* rename a field as a single operation and save your changes to the table at once. If you rename a field at the same time as you insert, delete or move fields, you may lose data.

## Field Properties: Field Size

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Once you have entered a name and data type for each of your fields, you have a usable table. But there are ways you could improve its design before you start entering data.



Field properties box

The box at the bottom left of the table design window allows you to set a whole range of **Field Properties**, including formatting, default values, validation rules and indexes. It isn't necessary for you to worry about most of these, but you do need to give some thought to the **Size** of each field that you create.

**Field Size** limits the number of characters allowed for each data item in that field. The default for a text field is 50 characters. Make sure field size is sufficient for your longest entries, or data may be truncated.

Access stores table data in a different and generally more efficient way than older types of database software. Setting the minimum possible field lengths to keep file size down isn't important in Access. However, for the sake of making your table as easy as possible to view on screen without having to mess around, it's worth making sure that the field size isn't vastly larger than you need.

To change the size or any other property of a field:

- Click in the Field whose properties you want to change. The Field Properties box will display the values currently specified for this field.

In the Booklist example these changes might be made:

- Click in the *Author* field. In the Field Properties box, alter **Field Size** from 50 to 30.
- You are likely to need more than 50 characters for the *Title* field. Alter Field Size from 50 to 70.
- 25 is probably enough for *Publisher Name*.

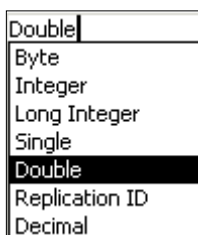
## Number field properties

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If you're changing the properties of a **Number** field: you specify a number setting, rather than specifying how many characters wide the field is to be. An arrow appears when you click in the Field Size box: this displays a popup of available options. If you're not a mathematician you may find these meaningless: don't worry. Usually it's OK to use the default setting.

The **Format** entry in the Field properties box is mainly used to apply different display settings to number fields.

- Select the field to which you want to apply format properties. In the **Field Properties** box, click in **Format**, and an arrow will appear. Click on this to display a list of the available options for the type of field currently selected.



The *Decimal* number setting was not available in Access 97.

General Number	3456.789
Currency	£3,456.79
Euro	€3,456.79
Fixed	3456.79
Standard	3,456.79
Percent	123.00%
Scientific	3.46E+03

# Entering Data in a Table

**TIP:**

Access will *automatically* add values in an Autonumber primary key field. It's often easiest to change field order (page 8) so autonumber fields are at the end, and thus don't get in your way when entering data.

- Open your table from the Database Window; or if it's open in Design view, switch to **Datasheet** view (page 10).
- Start entering some records.
- Press Enter, or use the Tab key, to move from one field to the next.
- **Be consistent** about where you use capital letters, how you punctuate and abbreviate, and so on.
- **Edit** record data just as you would edit text in Word.
- **Deleting records:** Click in the Row bar to highlight the record or records you want to delete, then use the keyboard delete button or toolbar cut icon. **Important: once you have deleted a record, you can't undo your action.**
- **Access saves each record as you enter it into the table**, whether you do this from a Form, or from the standard datasheet format. **So you don't need to worry about saving records as you go along.**

Column bar

Row bar

	Author	Title	Publisher	Date	
	Berg, Maxine	The Age of Manufactures, 1700-1820	Fontana	1985	Eighteen
	Harrison, J.F.C.	The Common People	Fontana	1984	Popular
	Laslett, Peter	The World we have Lost	Methuen	1965	Sociolog
	Thompson, E.P.	The Making of the English Working Class	Penguin	1981	First publ
	Briggs, Asa	Victorian Cities	Penguin	1968	Concentr
	Pinchbeck, Ivy	Women workers & the Industrial Revolution	Virago	1969	1st pub.

## Adjusting field display widths

You'll often want to adjust the display width which Access has allocated automatically for each field. To change the screen width of a field:

1. In the **Column bar**, position the mouse cursor on the dividing line to the *right* of the field whose width you want to alter. When the cursor changes to a "double arrow" shape:
2. **Click and drag** until the field display is the width you want. Double-clicking will automatically size to fit the longest entry.

Note that this *doesn't* change the actual field size. (See page 11.) It simply changes how much of the field you can see on screen.

*When you type in a field entry which is longer than can be displayed within the screen field width, your text will scroll along within the space available. Use the **Home** and **End** keys (right of keyboard) to move to the beginning or end of this field entry.*

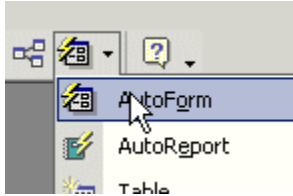
Most especially when you include memo fields, such as the *Summary* field in the example booklist table, you'll see the disadvantages of entering any more than a few words of text when using the datasheet entry format. For tables which include memo fields, or with a large number of fields, it's usually easiest to **create a form** for data entry.

Author	Title
Berg, Maxine	The .

Set row height in the same way by clicking and dragging when the mouse is over a row separator bar. Changes will be applied to the whole table.

# Using a Form for entering Data

Forms are often a more user-friendly way of entering data than using datasheet view. The quickest way to create a form is to start with an **Autoform**, and then modify it if you need to. If you want something entirely different from the standard Autoform layout, you can either use the *Form Wizards*, or start from scratch with a blank form.



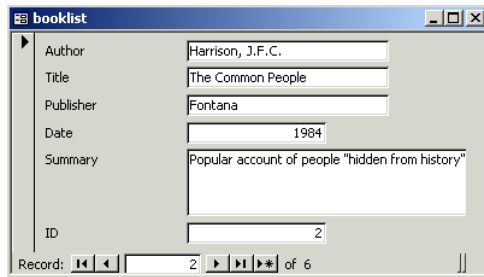
1. Make sure the table you want to create a form for is open in Datasheet view, or selected in the Database Window.

2. In the **Toolbar**, click on the arrow by **New Object**.

The popup menu displays all the object types which you can create.

3. Select **Autoform**, and a form will be instantly created.

The space allocated to each data item will reflect the *data types* and *field sizes* you specified in your table design (page 11).

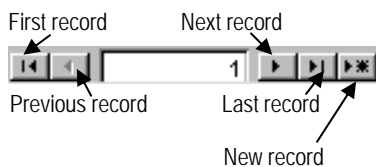


- Use the tab key, the arrow key, or the mouse to move between one field and the next while entering data.

- When you create a form in Access 2002/3, a **formatting toolbar** appears below the menu. Items you can change from here include typeface, background colour and borders. To modify *form layout*: see page 27.

- When you're happy with your layout, **Save** the Form.

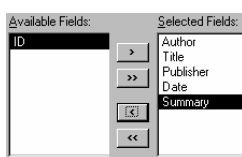
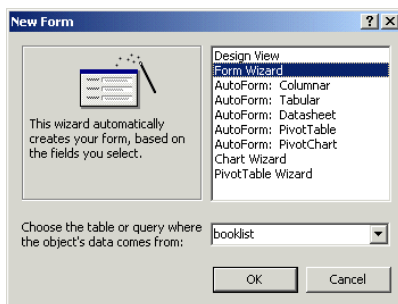
The name can be up to 64 characters long.



- Use the **video buttons** at the bottom left of the form window to move backwards and forwards through any records you have already entered. (Note that these keys are also available from the standard datasheet table window.)

- *To create new records*: click the new record button.

## The Form Wizard



Add all fields to the form with the >> button. Add or remove fields one by one with the > or < buttons.

You may want a different type of form layout from the one which Autoform gives you. If so:

1. Select **Form** instead of Autoform from the New Object menu. If you now select Design View, you won't have a wizard to help you and will almost certainly have no idea what you should do! **Form Wizard** is usually the choice you want. From here, you can be selective about what fields to include in your form – for example, you might not wish to display an autonumber field, which the user can't change. The standard *columnar* layout looks like the Booklist example illustrated above: one field per line.

2. Follow through the Form Wizard steps by clicking the **Next** button. You can select from a variety of *layouts* and *styles* – choose **standard** if you want something simple.

# Finding, Sorting, Filtering and Querying

If you've created a simple example table, it's likely to contain only a handful of records. "Real-life" databases will usually contain hundreds or thousands of records. The database user will want to instantly *find* particular records in a table; to order or *sort* the records in a variety of different ways; and to *filter* so that only records which meet a set of *conditions* or *criteria* are displayed.

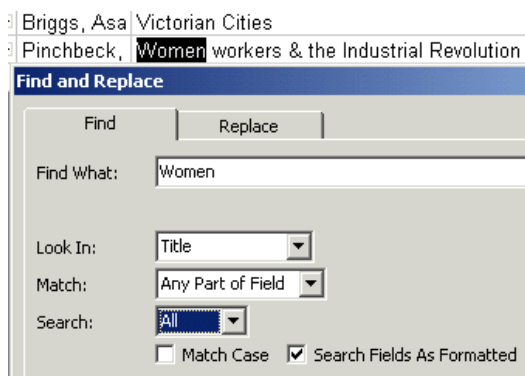
## Finding specific records



With your table open in either Datasheet or Form view:

1. Click in the field which will contain what you're looking for.
2. In the **Toolbar**, click on the **Find** button.

The Find dialog window will appear. Click and drag on the title bar to move the window so you can see your data properly while you're using it.

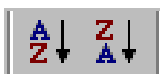


**Access 97:** If you want to search in all fields, uncheck the *Search Only Current Field* box. In 97, Find First is a separate choice from Find Next.

3. Enter what you're looking for in the **Find What** box.
4. By default, Access will only search in the active field (where the Insertion Point is currently placed). To search in all fields, click the arrow by the **Look In** box. Change the setting from the current field name to the table name.
5. Click on the arrow button by the **Match** box, and *make sure you select the appropriate option*. If you leave this set on Whole Field, in the example it would only find books with the specific title "Women", *not* books whose title *contained* the word "Women".
6. To find only instances where capitalisation matches what you've entered in the Find What box, click on *Match Case*.
7. Check that settings are as you require, then click on **Find Next**. The first record matching your search conditions will be highlighted. Click Find Next again to locate further matches.

Carry out as many searches as you want before closing the Find box.

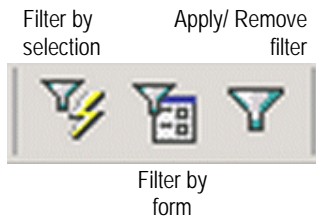
## Quick sorts



1. Open the table which you want to filter or sort, either in Datasheet or Form view.
2. Click in the column you want to sort on. In our example, you would click in the Author column if you wanted to sort the booklist alphabetically by author's name.
3. In the **Toolbar**, click on the **Sort Ascending** or **Sort Descending** button.



# Using filters



Publisher
Penguin

Using the **Find** tool picks out records one by one which contain the text or data you have specified. **Sorting** reorders the whole of your table. **Filtering** displays only the records which meet specified conditions.

## Filter by selection

In our example table, a bookseller might want to display only the books published by one particular publisher. Filter by selection offers a very quick way to do this kind of thing.

1. In your table, highlight an instance of the data value you want to filter by – Penguin in our example.
2. In the **Toolbar**, click the **Filter by selection** button.

Only records containing the data you had selected, in the same column that you had selected within, will now be displayed.

3. To return to viewing all records: in the **Toolbar**, click **Apply/Remove filter**.

## Filter by form

This lets you apply filters involving more than one field, or using *operators*: equals, greater than, less than.

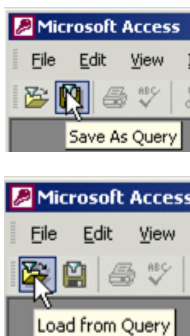
1. In the **Toolbar**, click the **Filter by form** button.
2. Click within a column. If you want to select your filtering condition from all the values which have been entered in the field, click the **arrow button** which appears. Or, use *comparison operators* – see the next page. In the example, the filter will show only books published by Penguin after 1980.

Author	Title	Publisher	Date	Summary	ID
		"Penguin"	>1980		

More sophisticated filtering conditions can be used just as in a query – see pages 19-20.

3. To *apply* the filter: in the **Toolbar**, click **Apply filter**. Click the same button again to *remove* it.

The last filter you used will automatically be saved with your table and can be reapplied when you next open it, but other filters previously used will be lost when you close a table. If you want to return to a particular ordering or filtering of your data, you can save the filter as a **query**.



- Click the **Filter by Form** button so your filter conditions are displayed. In the **Toolbar**, you should notice that the **Save** button has changed to **Save as Query**. Click the button, give your query a name, and OK.
- To apply a query from the toolbar: click **Filter by Form**. The **Toolbar Open** button will change to **Load from Query**.



# Using Queries

Queries are used to view, change, and analyze data in different ways. There are a variety of different **query types**, all of which can be *saved* for future use.

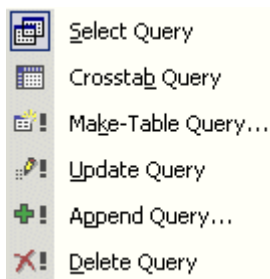
**Select queries** are the most common type: these provide an easy way of picking out and sorting a set of records which you want to display together. You can base forms and reports on select queries in the same way as on tables. You can also create queries based on other queries. In a relational database, a query can refer to more than one table.

Last Name	Category Name	SumOfSubtotal
Buchanan	Beverages	\$46,302.09
Buchanan	Condiments	\$16,789.95
Buchanan	Confections	\$36,182.13


  

Last Name	Beverages	Condiments	Confections
Buchanan	\$46,302.09	\$16,789.95	\$36,182.13

**Crosstab queries** can be used to summarise data from a table. In the example illustrated on the left, sales staff enter their sales with separate records for each product category. Using a crosstab query, sales performance of each member of staff can be compared across all product categories.



Other types of query are all **action queries** – queries that can make changes to a set of records "all in one go". These are normally created from select queries. **Delete** queries are used to delete records which meet the conditions you specify; **update** queries for making global changes to a set of records. **Make-table** creates a new table from the results of a query, and is especially useful if you want to export data to another database. **Append** queries let you add records from another table which match the conditions you specify.

 **Take great care when using Action queries, especially Update and Delete. Once you have run an action query, you can't undo the changes it will make to your table. Don't experiment on important data!**

Store *all* queries except crosstab queries as select queries, so data isn't unintentionally updated or deleted when a query is run. See page 22.

## Comparison Operators

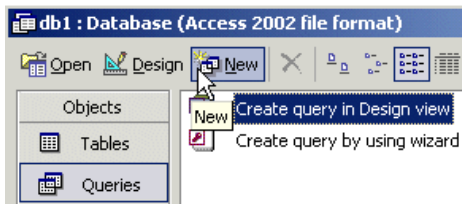
Before you start constructing queries, you should be familiar with the standard *comparison operators*. These are the same as used in Excel, dBASE, or any other spreadsheet and database software:

Operator	Meaning	Example	Records displayed
=	Equal to	Penguin	All books published by Penguin.
NOTE: Access will <i>assume</i> that you mean "equal to" if you don't specify any operator.			
<	Less than	< 1985	All books published before 1985.
>	Greater than	> 1985	All books published after 1985.
>=	Greater than or equal to	>= 1985	All books published in or after 1985.
<>	Not equal to	<> Penguin	All books not published by Penguin.

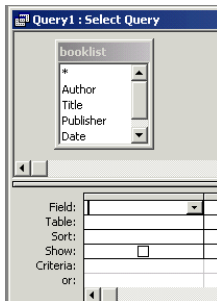
## Setting up a Query

- In the **Database Window**, click the **Queries** tab.

You can choose between creating a query using *Design View*, or using one of the *Query Wizards*. In general, it's easier to learn the principles of querying, and often quicker if you create your query in **Design view**. The exception to this is creating a crosstab query, which it's best to do by using the special **Crosstab Wizard** - select this by clicking on the **New** button. (In earlier Access versions, click the New button to select from all the available create query options.)



Unless the table you want to base your query on is already open, Access will ask you what table or query you want to use. If necessary, select the table you want from the picklist.



The **Select Query Window** will now open. The illustration shows just the lefthand side. The fields you require are selected from the **table picklist** at the top of the query window. At the bottom of the window is the **query grid**, where your query is constructed.

### Selecting the Fields to include in your Query

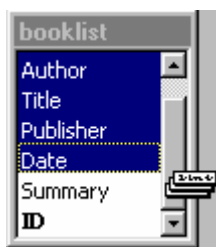
The first step in designing a query is to decide what fields you need to include. You need to include both the fields required to enter *conditions* for the query and the fields whose data you want to *display* - these won't always be the same.

*To add fields one by one:*

- In the table picklist, click on the field name, then **drag and drop** into the Field Row on the query grid. Repeat for every field you want to include.

*To add multiple fields at once:*

- *If the field names are adjacent in the picklist:* click on the **first** field you want (*Author* in the example), then hold down the **Shift** key while you click on the **last** field name (*Date* in the example). Click anywhere in the highlighted area, then drag and drop into the Field Row.
- *If the field names aren't adjacent:* hold down the **Control** key while you click on each one, then drag and drop as above.



Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist

The selected Field Names should now lay themselves out as illustrated.

*To remove fields one by one:*

- **Select** the column or columns in the grid, then delete or cut.

*To clear the query grid and start again:*

- From the **Edit** menu, select **Clear Grid**.

## Specifying the Query Sort Order

- In the **query grid**, click in the **Sort Box** for the field you want to order by. Now click on the **Arrow Button**, and select the appropriate Order option.

You can sort on one field, and within that, on another field. For example, a booklist would be likely to contain more than one book by some authors. So you might want to sort by author and within that by publication date, as in this example.

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending

The sequence in which the fields are displayed in the query will decide which is the *primary* sort field. Consequently, you may sometimes need to reorder the fields on the query grid. Do this by clicking on the column bar, then dragging and dropping the field to its required position. If you need to use a field to define your sort order, but don't want that field displayed, just uncheck the **Show** tickbox.

## Setting Criteria

Whether you're creating a query or a filter, you need to understand how to set **criteria** in order to select the data you want displayed. The standard *comparison operators* were introduced on page 16. Access also offers a variety of more sophisticated operators, which are described on the following pages.

- In the **Query Grid**, click in the **Criteria** box for the field where you want to apply a condition.

You can apply as many criteria as you want within a query. You might want these to be **And** conditions – "Find me all books

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			"Penguin"	>1985

published by Penguin after 1985" would be an example. This is an "And" query because it's asking for records

Example 1: **And** query.  
Access *automatically* adds inverted commas "" around text strings within criteria.

which meet *both of two conditions*. (Published by Penguin, and published after 1985.) The criteria which need to be entered are illustrated above.

- Criteria are treated as *And* conditions when they are placed on the same row in the Query Grid.**
- Criteria are treated as *Or* conditions when they are placed on different rows in the Query Grid.**

Example 2: **Or** query.  
"Find me all books published by Penguin or Fontana after 1985" contains an **Or** condition.

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			"Penguin"	>1985
or:			"Fontana"	>1985

Note that the "after 1985" condition has to be repeated for both publishers.

## Showing and hiding fields

Field:	Author
Table:	booklist
Sort:	Ascending
Show:	<input checked="" type="checkbox"/>

When you use a field to set criteria, you won't necessarily want to display it. In Example 1 on the previous page, you would give the query a title such as "*Books published by Penguin*" – there's no need to display the Publisher in every record. In the Query Grid, uncheck the **Show** tickbox so the field isn't displayed in the query results.

## Using the "Like" operator for "Contains" searches

An "equal to" comparison operator only works when the string of characters you are seeking is *exactly the same as the entire contents of a field*. Database users often wish to search for all records which **contain** a particular string of characters within one field.

In Access, you use the **Like Operator**, together with **Wildcards**, to construct "contains" queries. Access uses the wildcards which are standard in all Windows software:

- ? substitutes for a single character
- \* substitutes for a group of characters

In our example booklist, you might decide that you wanted to find all the books about issues relating to women. However, it wouldn't be satisfactory to construct your query simply to select books containing the word "women" – if you did this, you would miss out on any books whose title contained the word "woman".

**You need to give a good deal of thought to specifying your query conditions correctly to ensure that you get *all* the relevant data, and *only* the relevant data.**

Field:	Author	Title
Table:	booklist	booklist
Sort:	Ascending	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		Like "*"wom*"

To resolve this problem in the example, you might choose to specify your query as "*Find me all the books whose title contains Wom*" – you'll then pick up both Woman and Women with one condition. This is fine as long as your booklist doesn't contain books about Wombats as well!

The expression **Like \*wom?n\*** will pick out all titles containing "woman" or "women", without having to worry that books about wombats will also be included.

Field:	Author	Title
Table:	booklist	booklist
Sort:	Ascending	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		Like "*"wom?n"

If you placed an asterisk at the beginning but not the end of "wom?n" (\*wom?n), you'd get only the titles which *finished* with these letters. If you placed an asterisk at the end but not the beginning (wom?n\*), you'd get only the titles which *started* with these letters.

## Other Useful Operators

- **Between ... And** Use this operator to select all records within a particular range, as in this query to find all books published between 1985 and 1990:

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:				Between 1985 and 1990

- **In Operator.** Use to select records which have one of a *set* of values. This is often a handy alternative to a lot of **Or conditions** (see page 18). This query would select books published by Fontana, Penguin or Methuen:

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			In ("Fontana","Penguin","Methuen")	

To use the In operator, enclose your set of values in *brackets* (), and place a *comma* between each value in the set. (Access automatically adds inverted commas around character values.)

- **And Operator.** Use to specify two values as an **And condition** (page 18) *within the same field*. This query would select books where the title contained "Wom" *and* contained "Industrial":

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		Like "%wom%" And Like "%industrial%"		

- **Not Operator.** Use to specify an "anything except" condition. (For instance Not Like, Not In.) Mix and match conditions as you need to. The query below would ensure you didn't pick up books about wombats when searching for books about women. *Warning:* Not Like and Not In queries may run very slowly.

Field:	Author	Title	Publisher	Date
Table:	booklist	booklist	booklist	booklist
Sort:	Ascending			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		Like "%wom%" And Not Like "%wombat%"		

- Don't forget – you must use *Wildcards* (page 19) when you use the Like Operator.**
- Access automatically adds inverted commas "" around the text strings you specify in a query, and capitalises the first letters of operator names.**
- If you use *And* queries where one of your conditions contains the word "and" – for example, the publisher "Faber and Faber", you *must* add the quotation marks manually so that your meaning is clear to Access.**

## Running a Query

---

When you're satisfied that you've got your query conditions right, test it out. With the query still displayed on screen:



- In the **Toolbar**, click on the **Run** button.

Having seen the query results, you may want to modify the query conditions:



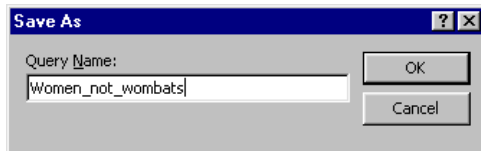
- Click on the **Design** button (left of the **Toolbar**).

Where you have a number of specific queries which are "variations on the same theme", you will often want to flip to and fro between modifying and viewing your query without saving each variation.

## Saving a Query

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- In the **Toolbar**, click on the **Save** button; *or* from the **File** menu, select **Save**.



You haven't yet given a name to this query, so a "Save As" box will appear. Bear in mind the same points as when naming a table. (page 9).

You can now run or modify this query whenever you want:

- In the database window, select the **Queries** tab. To run the query: double-click the query name or click the **Open** button. To modify the query: select it then click the **Design** button.

## Copying Queries

---

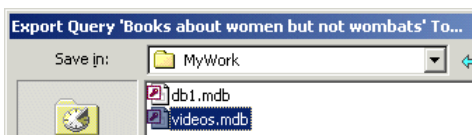
It's often useful to copy a query so that you can use it as the basis for a new one, rather than redefining all the fields to include, criteria and so on from scratch.

*To save a copy of a query within the same database file:*

- Make sure the query you want to copy is open, or selected in the Database window.
- From the **File** menu, select **Save As**, and give your query a new name.

*To export a copy of a query to a different database file:*

- Make sure the query you want to copy is open, or selected in the Database window.
- From the **File** menu, select **Export**. The **Export Query**



window will open. Select the Access .mdb file you want to export to. You can only export a query into another Access database if it's saved in the same version of Access. (See page 31.)

- Exporting to other software formats (for example Excel or dBase) only exports the query *results*, not the query design.

## Using Parameters in Queries

---

Querying of a database often involves "variations on a theme". In our booklist example, on one occasion the user may want to list all titles published by Methuen; and on another, all titles published by Penguin. Rather than continually returning to the query design window to modify the query, it makes more sense for the user to

Field:	Author	Title	Publisher
Table:	booklist	booklist	booklist
Sort:	Ascending		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			[Enter name of publisher]

"pass a parameter". All this means is that Access will *prompt the user* to specify a value – in our example, for the *variable* Publisher. This value will then be *passed in* to the query. The example shows a

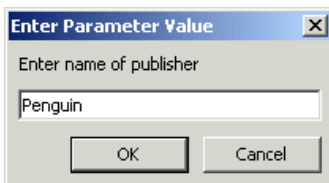
*parameter query* which does this.

- In the field where you want the user to specify a value, type the text which you want to appear in the **user prompt**. Enclose this in square brackets.[] To avoid confusing Access, the prompt text shouldn't be identical to the field name.

For a simple parameter query, this user prompt in square brackets is all that you need.

## Running a parameter query

---



- In the **Toolbar**, click on the **Run** button. An *Enter Parameter Value* dialog box will appear, with the prompt you specified.
- Enter an appropriate value, and OK.

The selected data will now be displayed. When you're happy that your query does the right thing, don't forget to **save** it (page 21).

You can create parameter queries which prompt the user for more than one value. You would want to do this, for example, if you used the Between...And operator in a parameter query. You might want to set up a query on the Booklist where the user could view all books published between any two dates they specified. The criterion would look like this:

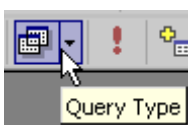
**Between [Earliest Date] And [Latest Date]**

You can use wildcards (page 19) in a parameter query - to find out how, type *Parameter Query* in the Ask a Question Box (top right of the Access window), then select *Create a Parameter Query*.

## Converting between select and action queries

---

When using action queries (page 16), it's always advisable to start with a select query and check that this correctly selects the records which you want the action to apply to. Queries can easily be converted while open between one type and another. **Always make a backup copy of your database before you run an update, append or delete query - you can't undo the results.**



- In the **Toolbar**, click the arrow by the **query type** button, and select the type of action query you want from the list.



# Formatting & printing out your Data

You can make a printout of your data straight from a table or a query. However, the formatting options available to you if you do this are limited. If your table includes memo fields, or particularly long text fields, you may find that it's impossible to set it up to print straight from a table or query without those fields being truncated.

When you're printing from a database, it's usually best to create a **report**, which gives you much more control over page layout, and allows you to *group* data in the printout. When you are working with numerical data, this also means that your report can include automatically generated subtotals or other calculations. See page 25.

- If more than one printer is available from the computer where you're working, select the correct one from **Printer Setup** *before* you prepare your file for printing. Changing printer can make a significant difference to what fits on the page.
- If you move an Access file between different computer setups (for instance between home and work or college) bear in mind that things may look very different if the **fonts** used aren't available on both computers.

## Changing type style and size

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- Formatting selected text doesn't work in Access as it does in other Office software.**

You might expect that you could format different columns of your datasheet separately. For instance in our booklist example, you might want the titles to be printed in italic; or set the date column so that it's aligned left instead of right. You need to create a report or copy and paste to a Word table to do this.

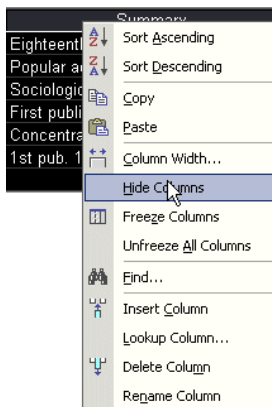
*To make global changes to the entire datasheet:* in Access 2002/3, a **datasheet formatting toolbar** is available.

- Open your table in datasheet view. From the **View** menu, select **Toolbars**, then **Formatting (Datasheet)**. Use these tools as you would in Word, bearing in mind that all formatting you apply will affect the entire datasheet, and can't just be applied to selected items.

In earlier Access versions, you have the same control over datasheet formatting, but a toolbar isn't available. Use the **Format** menu items instead.

- Arial Narrow, 10pt, is a good choice for compactness and readability when working with tables.**

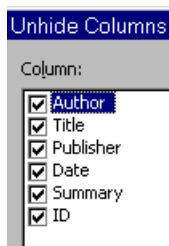
## Hiding and Showing Columns



**Hiding** a column or field in your datasheet view means that it won't display or print until you **show** it again. This doesn't delete the data.

1. **Display** your table in **datasheet view**.
2. **Right-click** on the **title bar** at the top of the field column you want to hide from view. This selects the column and opens the popup menu in one action.
3. From the **popup menu**, select **hide columns**.

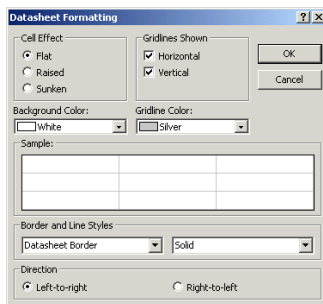
**Notice the other options available to you from the shortcut menu when you right-click.** As with most Windows software, the right mouse button plays an important part in providing quick access to the commands you're currently most likely to need. Experiment!



To restore a hidden column:

1. From the **Format menu**, select **Unhide Columns**.
2. In the Unhide Columns window, make sure all the fields you want to display are ticked, and **Close**.

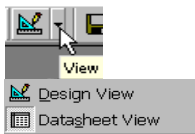
## Hiding Gridlines; changing background colour



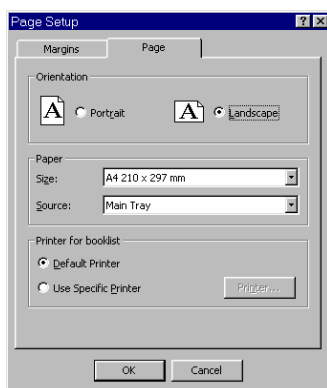
You can set gridlines to different colours, or not to show at all. By default, an Access table will print with gridlines displayed. To change this:

- From the **Format menu**, select **Datasheet (Access 97: Cells)**. Click off the ticks under **Gridlines Shown** if you don't want any gridlines displayed. You can also change background colour for your datasheet from here.

## Printing direct from a Table or Query



Where you want a standard datasheet (multiple-column layout), it may not be necessary to create a report.



1. Make sure you're looking at your table or query in **Datasheet view**. **Check** that the data is filtered and /or sorted exactly as you want it to appear in the printout. **Resize** table columns if data is truncated in your onscreen view.
2. Many tables look better if you change your **page orientation** from portrait (long and thin) to landscape (short and wide). To do this: from the **File menu**, select **Page Setup**, click the **Page** tab, and select **Landscape**.
3. **Always check in Print Preview before printing.** By default, Access will commonly "tile" the columns in your table over two pages. You may need to change orientation, hide unneeded columns, or reduce type size to avoid this.

# Using a Report for Printing Data

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**A report can be based either on a table, or on a query.**

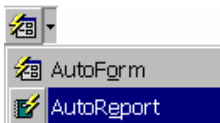
Reports give you much more flexibility over data layout than printing straight from a datasheet view. Once you have created a report, you can save it and use it at any time to print out an up-to-date version of your table or query data.

## Creating a report with Autoreport

---

For a simple report including all fields in standard form layout:

1. Open your table or query in datasheet view, or highlight its name in the database window.
2. In the **Toolbar**, click the arrow by the New Objects button, and select **Autoreport** from the popup menu.



The Toolbar New Objects button is *context sensitive* – it will change to show the most recently created object type.

If you're lucky, Autoreport will give you almost but not quite the layout you want. You will probably wish to add a heading, and perhaps leave some fields out of the report. (For example, an autonumber field.) If so, take the Autoreport as your starting-point and *modify* it – see page 27; or use the Report Wizard instead.

## Using the Report Wizard

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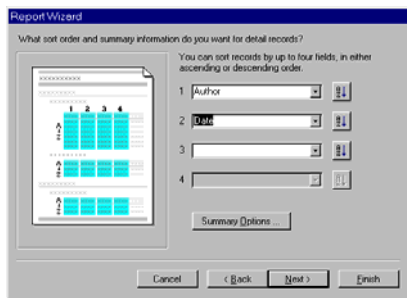
If you know at the outset that you want something more customised, the *Report Wizard* allows you to exercise some control over what you start with: what fields you use, what order they appear in, how they are laid out and grouped. As with Autoreports, you can easily modify the layout later on to suit your needs.

- In the **Database window**, click the **Reports** tab. In Access 2002/3, double-click **Create Report by using Wizard**. (In earlier Access versions, click the **New** button, then select **Report Wizard**.)

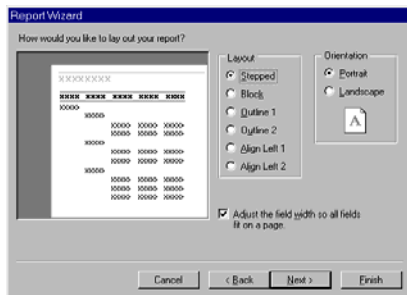
The **Report Wizard dialog box** will appear.

1. From the **Tables/Queries** picklist, select the table or query you want to base your report on.
2. Select the **fields** you want to include in your report. Use the **>>** button to add all fields, then remove any you don't want with the **<** button. Highlight and add one-by-one with the **>** button if you want to change their order on the report. Click **Next** when you have selected the fields you want.
3. If you want your report to be grouped by a field, select the field you want to group by from the picklist on the left. In the example, the booklist will be grouped by *publisher*.





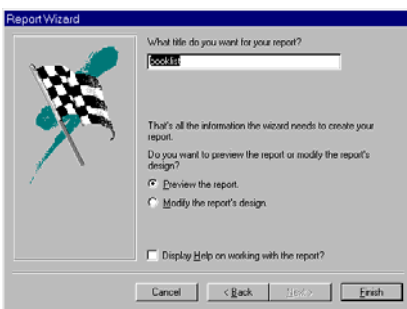
4. You will now be asked what **sort order** you want for your records. Whether or not you have also grouped your records by a field, you are likely to want to print them in sorted order. In the booklist example, you might have chosen to *group* by publisher, and within that want to *sort* in alphabetical order of author's name. Within that again, you could have each author's books ordered by date of publication – to do this Author should be the field selected in the first "Sort By" box, and Date in the second box. When you have specified the Sort fields:



5. Click on the **Next** button, and specify how you would like to **lay out** your report. Try out the different options – the preview window will show you the effects.

- Usually, you will want to leave *Adjust the field width so all fields fit on a page* switched **on**. If you click it off, your columns may be *tiled* across more than one sheet of paper.

- Check that page **orientation** (page 24) is set as you require, then click on **Next**.



6. Try out the different **style options** for your report (not illustrated), and click on **Next**.

7. You have now arrived at the last step of the Report Wizard. Provide a **title** for your report.

- Click on **Preview the report** to check its appearance, then **Finish**.

### booklist

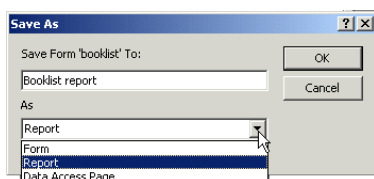
Publisher	Author	Date	Title	Summary
Fontana	Berg, Maxine	1985	The Age of Manufactures, 1700-	Eighteenth century economy as vital transition period
	Harrison, J.F.C.	1984	The Common People	Popular account of people "hidden from history"
Methuen	Laslett, Peter	1965	The World we have Lost	Sociological history - seventeenth century England

Our example Booklist report created with the wizard will look like the illustration. Long entries in the Title field have been truncated, and spacing between fields could be improved. But this can be easily adjusted once the report is saved - see the next page.

- In the Menu Bar, click on **File**, then **Save As**. Enter an appropriate name for your report (this can be up to 64 characters long), and click OK.

## Saving a form as a report

You can save a **form** (see page 13) as a report – if you have put some work into customising a form layout for data entry, this can avoid a lot of duplicated effort.



- In the **database window**, click the **Forms** tab, then **highlight** the name of the form you want to base a report on.
- From the **File** Menu, select **Save As**. Under **As**, select **Report**. Once saved, make any layout adjustments required (p.27). *In Access 97*: right-click on the name of the form you want to base a report on. From the popup menu, select *Save as Report*.

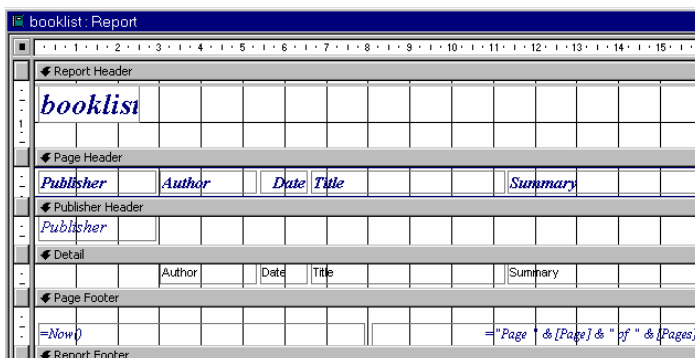
# Improving Form and Report Layout

The methods by which you modify Form and Report layouts are mostly identical, but with Reports you have some additional features. In particular, these allow you to use **functions** for printing information such as current date, totals and sub-totals automatically.

- *If you have created a report using Autoreport or Report Wizard, it will automatically be displayed in **Print Preview** mode – you can't edit it in this view. If you want to make modifications, click on the **Close** button. You will be taken to the **Design Window**.*
- *If you have saved a form or report which you now want to modify: in the Database Window, highlight the name of the Form or Report which you want to modify, then click on **Design**. The Form or Report Design Window will open.*

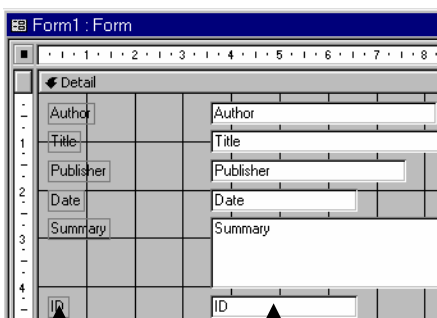
## Understanding the Design Window

In any report or form design window, you'll see boxes containing headings, field names, field contents etc. The **rulers** and the **layout grid** allow you to quickly align these different objects in the report or form. Example 1 shows what the sample report created with the **Report Wizard** (see previous page) looks like in Design view. Notice how the window is divided into horizontal sections:



Example 1: Wizarded Report in Design View.

Example 2: Autoform in Design View.



Field names

Field contents

**Report header:** for a title on the first page.

**Page header:** for headings to be repeated at the top of each page.

**Group header:** (in the example, Publisher Header) – contains the name of any field you have grouped by.

**Detail:** where the data for each record is displayed.

**Page footer:** for footers at the bottom of each page. In the example, the Report Wizard has automatically included two **functions** – **Date** and **Page x of y** in the footer area.

**Report footer:** for a "final sign-off" at the end of the report.

Example 2 shows an **Autoform** in the Design window. Only a Detail section is initially included -you need to add a form header section if you want to give the form a title (see page 30). In this single-column layout, both Field names and Field contents are contained within the Detail section. Compare this with the multiple-column report layout above, which contains the field names in a page header area separate from the details area, and where the field contents are laid out along one row.

## Controls

Think of the items laid out in your design window as a set of different *objects* – various headings, field names, field contents boxes, and functions. Each object is boxed in what Access calls a **control**.

Once you have selected a control or controls, you can *move* them or *size* them to improve your report or form layout. You can format the text to whatever type size and style you want. You may also want to *delete* some controls – for instance any fields or field names you don't want to include. Where controls are *labels* (for instance headings or field names) rather than data items, you can also *edit the text*.



Cursor

### Selecting and moving controls

- Click on any control to **select** it. **Handles** (black boxes) will appear around its borders.
- *To select more than one control:* hold down the **Shift** key while you click on each one.
- *To select all the controls within a report or form section:* move the cursor until it's within the vertical ruler bar next to the section. Click when the cursor changes to a black arrow.

If you are using a standard form layout, or a report layout where the field names and field contents appear together in the details section, you'll notice that when you select a field name control a handle will also appear on the field contents control, and vice versa. Access gives you the option of moving linked controls together, or separately.



- If you point the cursor at the *top left* handle of a selected control, it will change to a "single pointing finger" shape and *only* that control will be moved when you click and drag.
- If you point the cursor anywhere at the border of a selected control *except* at a handle, it will change to a "flat hand" and, if the selected control is linked to another one, *both* controls will move when you click and drag.

As you are moving a control or controls:

- Watch the black highlighted areas in the **ruler bars** which show the current position of the objects being moved.
- If the ruler bars don't show: from the **View** menu select **Ruler**.

### Resizing Controls

You may need to change the amount of space which has been wizarded for headings, field names or field contents.

- Select the control or controls you want to resize. Move the mouse over any handle except the top left one. When the cursor changes to a **two-way arrow**, click and drag.





## Changing type style and size

When a control is selected, the Toolbar changes so that the tools for changing font, size, alignment and colour are available just as they are in Word. There are also some extra tools on the right for adding borders and special effects to a control. Run the mouse *slowly* over the toolbar to see the *tool tip* telling you what each button does.



## Adding text, lines and boxes

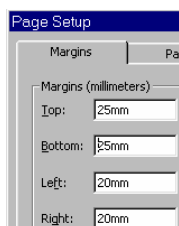
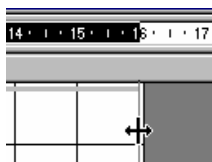


- Extra tools for formatting reports and forms are available in a *toolbox*, normally located at the left of the window. If this isn't visible on screen: in the **Toolbar**, click the **Toolbox** button.
- *To add a heading or other text item to your report:* click the toolbox **label** button. The cursor will change shape as illustrated. Click and drag to draw a box to contain your heading, then type within this box and format as usual.
- Use the **line** and **rectangle** tools at the bottom of the *toolbox* if you want to add lines or boxes to your form or report. Select your line or box and use the tools at the right of the *toolbar* to modify line colour and width, or add special effects.

The toolbox contains a variety of tools which permit far more complex form and report design than is covered here. In **Contents Help**, look at the topics available under **Controls and Charts**. (*Access 97: Working with Controls on Forms and Reports.*)

## Resizing sections and the overall form/report area

If you have moved or resized controls within a section, you will often need to add extra vertical space *within that section* to accommodate your changes. Or, for example, you may want to reduce or increase the space between records by resizing the Detail section.

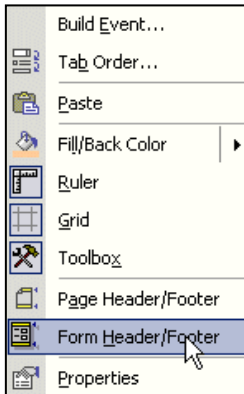


- Move the mouse so the cursor is over a section division. When the cursor changes to the shape illustrated, click and drag.
- If you want to resize the overall report or form area:*
- If necessary, enlarge the design window so that the blank space available for you to extend into is visible.
  - Move the mouse over the form or report boundary. When the cursor changes to the shape illustrated, click and drag.
  - If you're modifying a report, watch the ruler bar to make sure you aren't extending the width of the report beyond the paper size you're using. Remember to allow for margins.
  - *You may need to adjust margins* to accommodate the width of a report. For instance, if you extended the report area width to 17 cm, to print on A4 paper (21 cm wide) left and right margins would need to be a maximum of 2 cm each. Change margins and page orientation from **File | Page Setup**.



## Adding or deleting header and footer sections

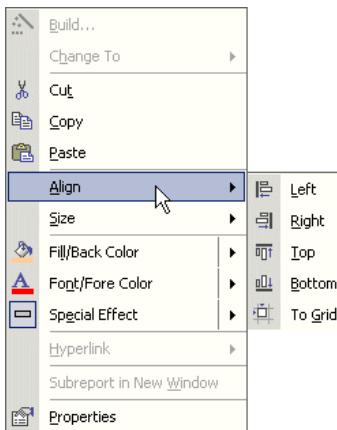
You'll need to do this if you have created an Autoform and want to add a title – when the form or report is first displayed in Design view, there will be no Header section to place this in.



- **Right-click** anywhere within the form or report area, but *not* on a control. The shortcut menu will appear.
- **Page Header/Footer** and **Form (or Report) Header/Footer** are near the bottom of the menu. Make sure you're clear about which you want (see page 27). Click *on*, and a new section will appear in the design window. Click *off*, and that section will be *removed* – including any controls you have placed within it.

## Aligning controls

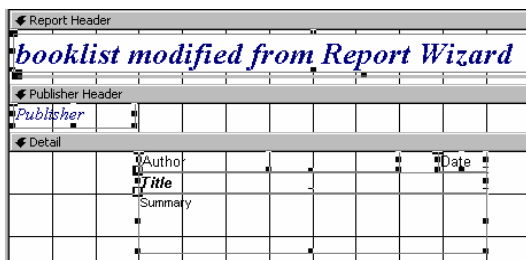
When you start moving controls around or resizing them, you're sure to have problems getting them properly lined up with each other again. Get things roughly in place by eye, then use the Align tool for fine adjustment.



- Hold down the **shift** key while you click on the controls you want to line up with each other.
- **Right-click** on the mouse, select **Align** from the shortcut menu, then select alignment type.

**Notice the other commands which you can reach from the right mouse button. You may find this quicker than using the Toolbar.**

## An example modification



*booklist modified from Report Wizard*

Fontana

Berg, Maxine	1985
<b><i>The Age of Manufactures, 1700-1820</i></b>	
Eighteenth century economy - vital transition between pre-industrial and industrial economies.	
Harrison, J.F.C.	1984
<b><i>The Common People</i></b>	
Popular account of people "hidden from history", from Norman Conquest to present	

The starting-point was a Report Wizard (page 25).

- The *page header* section containing field name controls has been deleted. "What's what" is self-evident from the field content.
- The Title field has been formatted ***bold italic***.
- The Summary field is a smaller size text.
- The Detail controls have been repositioned so that Author and Date share a line, with Title and Summary each on a new line. The width of the Title control has been extended so it doesn't truncate.
- Controls in the Details section have been moved so there is less vertical space between them.
- The Details section has been resized so there is less space between each record.

# Importing and Exporting Data

## Transferring between different Access versions

- Always make a backup copy of important database files, *before* opening in a different software version.**

An Access 97 file can be opened or converted in all later versions. Access 2000/2002/2003 are set by default to save files in the Access 2000 file format. This means that, unless the setting has been changed by the user (or, on centrally-administered networked PCs, the network administrator), no difficulties should be encountered in moving files between Access 2000-2003.

- When you have a file open in Access 2002/3, the *title bar* of the *database window* tells you what format the file has been saved in.**

If your file is not in Access 2000 format, *before* you copy your file for transfer you will need to use the Access **Convert Database utility**. Conversion to Access 2000 format creates a file which will open in all versions from 2000-2003. If you want to transfer your file to a PC running Access 97, you must convert from here to 97 format.

To convert to a different format:

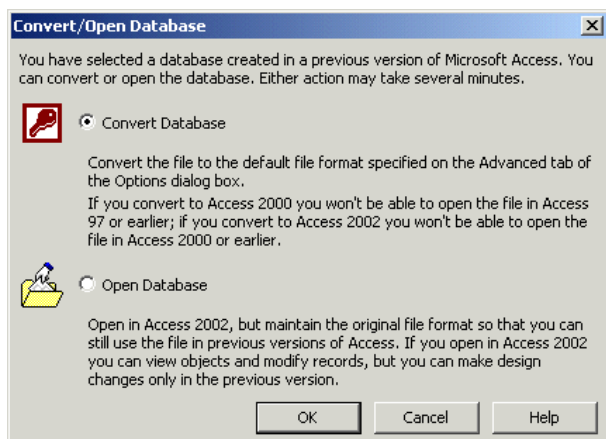
1. From the **Tools** menu select **Database Utilities | Convert Database**. Select the required Access version.
2. When you convert you must specify a new filename and/or file location - the converted file can't replace the original.

If you have used any features which weren't available in an earlier Access version you are transferring to, they won't be correctly handled. If you're converting to Access 97, see the side panel.

### Converting to Access 97: points to watch for

If you have used the *decimal number type* and want to open your database in Access 97 - change the number type to *Double* before conversion. Apart from this, problems are much more likely to arise for advanced database users working with complex relational databases and databases which include modules.

## Opening an Access file without converting



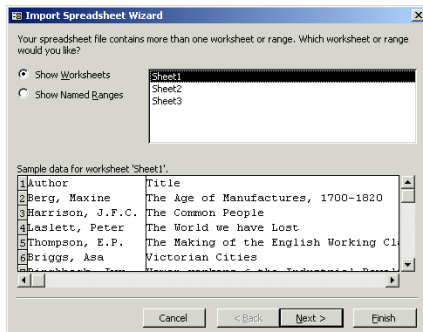
In Access 2000-3, you can choose between **Converting** or simply **Opening** a database. If you only want to view, add or modify database records, conversion isn't necessary. This is mainly useful if you want to open an Access 97 file in a later version, and then still be able to open the file again in Access 97. The limitation is that you can't make design changes to a database. Organise your work so that you make any necessary design changes to tables, forms or reports in your database while it's open in the earlier Access version.

# Importing data from Word and Excel

It's possible to copy and paste data from a Word table or an Excel spreadsheet straight into Access. But to do so, you must first have created an Access table structured so that the number of fields and field width correspond to the columns in the data you are pasting.

It's almost always easier to use the **Import Spreadsheet wizard**, which automatically creates a table to receive the data. If the data you want to load into Access is held in a Word table, copy and paste it into Excel first so that you can use the Wizard.

1. Make sure *all* the data you want imported to Access, and *only* that data, is on a worksheet by itself. This should consist only of data columns, and column headings – *not* main titles, charts etc. Move or copy data to a new worksheet if necessary.
2. If your data includes date or time columns, make sure that these are formatted to the correct data type *before* importing from Excel. Select the relevant cells, then choose the appropriate option from **Format | Cells | Number**.
3. Save and close the Excel worksheet before importing.
4. Make sure the database in which you want to store the imported data is open in Access.
5. From the Access **File** menu, select **Get External data**, then **Import**. The Import window will open. Set **Files of Type** to **Microsoft Excel**, select your file, and click **Import**.



6. The *Import Spreadsheet wizard* will open. Select the **worksheet** which contains your data, and check that the sample data displayed looks correct.  
**Cancel** if the sample doesn't look as you expect, and return to Excel to set up your data correctly. Otherwise, click the **Next** button to carry on to the next step.
7. Specify whether or not the first row of your data contains **column headings** – if this is checked, the first row will be used to supply field names automatically. Click **Next**.

8. Select whether you want the data stored in a **new table** or an existing table. If you want to import the data into an existing table, the structure of that table must be correctly set up for the data you're importing - for this reason it's normally easiest to import the data into a new table.
9. If you want to change field names, or omit any fields from the table, make these changes.
10. If the table already has a **primary key**, select it. Otherwise, let Access add a primary key for you. (See page 9.) Click **Next**.
11. Give the table a name, then click **Finish**.

**Comma-delimited text:** a simple way of defining a table in text-only format. Fields are separated by commas. If there are commas within a field, the data in that field must be placed in inverted commas to avoid confusion.



**Use File – Get External Data – Import** to import tables from other standard database and spreadsheet formats; **text** (e.g. comma-delimited) files and **HTML**, as well as Excel. You can also import tables from other Access databases.

## Linking external data

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If external data is *linked* rather than imported, you can work with the data, without making it part of the current Access database. Link rather than importing when you want to:

1. Use a table stored in a different Access database file, in conjunction with tables in the database you're working from. Access doesn't allow you to have more than one database open.
2. Use Access as a "front end" for working with data which is stored in a different software format.

In these cases, linking avoids the serious confusions which arise if you have duplicate working copies of the same data – which is to be treated as the "master" table? To link a table:

- From the **File** menu, select **Get External Data**, then **Link Tables**. Set **Files of Type** to the correct software format, then carry on as when importing tables.

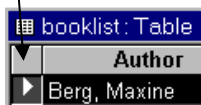
## Exporting data by copying and pasting

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To copy or paste into Word or Excel:

1. Open your table or query in datasheet view and check that what you're displaying is exactly the data you want to export.
2. Select the data you want to copy. To highlight the whole datasheet: click on the **Select All** button in the top left corner. To select a block of adjacent records, click in the button bar by the first record in the block, then hold down the **Shift** key while you click the bar by the last one. In Access, you *can't* use Ctrl + Click to select non-adjacent records.
3. In the toolbar, click the **Copy** button.
4. Open your Word or Excel file, and click where you want the data to be pasted.
5. In the toolbar, click the **Paste** button.
6. You may need to make adjustments to column width and/or row height, especially if you have pasted into Word. Word 97 doesn't behave nearly so well as Word 2000-2003 in this respect, but normally the options available from the Table | Autofit menu will put things right without difficulty.

Select all button



Author	Title	Publisher	Date	Summary
Berg, Maxine	The Age of Manufactures, 1700-1820	Fontana	1985	Eighteenth century economy – vital transition between pre-industrial and industrial economies.
Briggs, Asa	Victorian Cities	Penguin	1968	1st pub 1963. Concentrates on Manchester, Leeds, Birmingham, Middlesbrough, London, also Melbourne, Australia.

The example was copied and pasted from Access to Word as described above. Be warned that Word doesn't handle *large* tables well – it's best to print direct from Access.

- Use File – Export** to export tables to **dBASE**, **FoxPro**, and **HTML**, as well as Excel. The procedure is straightforward.

# Relating tables within a database

Linking tables to one another to create a *relational database* is often useful. Designing such a database can be complex and you will need to understand some theory. All this section does is to look at some very basic issues.

To relate two tables, they must share a *common field* or fields. These fields must be of the *same type*, and should be the *same length*. It's simplest if common fields share the same name.

When you **create a relationship** between two tables, one table is the *primary* table, and the other is the *related* table. **The primary table should have the common field as its primary key.**

Page 9 explains about defining primary keys.

In our example database, a bookseller might want to relate the booklist table to a table containing publisher details, on the common publisher name field. (For instance, for stock ordering purposes.)

Publishers : Table			
	Publisher	Address	Contact
+	Fontana	King St London	Fred Brown
+	Methuen	Methuen House	Simon Smith
-	Penguin	Harmondsworth	Jane McKenna
	Author	Title	Date
▶	Thompson	The Making of the English Working C	1981
	Briggs, Asa	Victorian Cities	1968
*			

A new feature in Access 2002: once a relationship has been created between two tables, you'll see + buttons by the side of each record in the primary table. Click the + sign to view the related records - you can edit and add new records from here if you wish.

The publisher table will be the primary table, with the publisher name field as its primary key. It has a *one-to-many* relationship with the booklist table – for one publisher, there will be many books listed.

Often, an autonumber field will be used to provide a unique ID as the primary key for the primary table, and this ID will be entered as the common field in the related table. For example, a shop might keep a Customer Details table containing customer name, address, and a Customer ID number. In a separate Orders table, Order details could then be linked to Customer details by including the Customer ID for each order. One customer may place many orders – using linked tables means that you don't repeatedly have to enter the customer details in each Order record.

## Before you begin...

- **"One-To-Many"** means one of the related fields is a primary key or has a unique index.
- **"One-To-One"** means both of the related fields are primary keys or have unique indexes.
- **"Indeterminate"** means neither field is a primary key or has a unique index. To prevent an Indeterminate relationship, define at least one primary key or unique index for a related field.

Relationship types

- 1: Only include rows where the joined fields from both tables are equal.
- 2: Include ALL records from 'Publisher' and only those records from 'booklist' where the joined fields are equal.
- 3: Include ALL records from 'booklist' and only those records from 'Publisher' where the joined fields are equal.

Join types

1. Make sure that the tables you want to link have a common field with the same name and data type, and that this is defined as the primary key in the primary table. If the primary key is an autonumber, make sure the data type is set to *long integer*.
2. Be clear about what type of **relationship** you want to create. If you see the relationship type described as *indeterminate* when you are creating a relationship between tables, cancel what you're doing and make sure you followed step 1 properly.
3. Be clear in advance about the type of **join** you want to create – the different join types are shown on the left. The default – what you get if you don't change it – will normally be type (1).

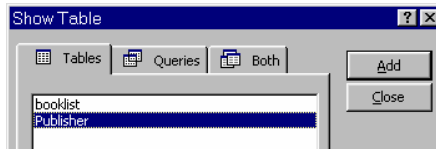


## Creating a Relationship

You can specify a relationship permanently between two tables, or temporarily within a query. To create a permanent relationship:

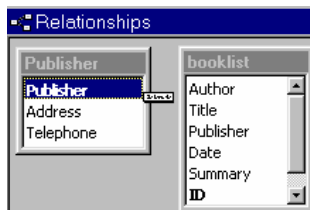


- Close any open tables or other database objects, leaving only the Database Window open.
- In the Toolbar, click the **Relationships** button.



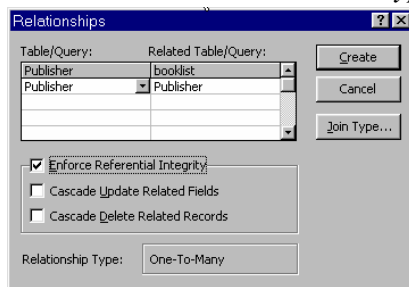
The **Show Table** window should open. If not, select Relationships from the menu, then Show Table. Notice that you can relate queries in just the same way as tables if you wish.

- **Select** each table you want to relate, and click on **Add**.
- Click **Close** when you have finished adding tables.



The *relationships* window will now appear:

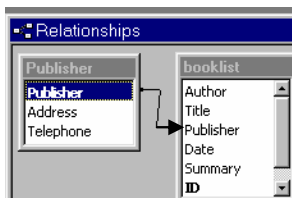
- **Highlight** your primary key and **drag** across to the related field. The cursor will look like the illustration.
- In the dialog box which appears, check that the *relationship type* is as you expect, and that the correct *join type* is selected (see previous page). You can also *enforce referential integrity* if you wish.



**Referential Integrity** is an important concept in relational database management. When you have two or more linked tables, you can seriously screw things up if you break links by deleting or editing a record in one table, without deleting or editing linked records in another table – this is known as leaving "orphan records". If

Referential Integrity is enforced, Access will prevent you from deleting or editing a primary record upon which related records depend; or from adding records where there is no related primary record. Not all table structures will permit this.

- Click the **Create** button, and the linkage between tables should be illustrated in the Relationships window as shown.



## Setting Relationships in Multiple Table Queries

You can set relationships "on the fly" while you are building a query. You can relate more than two tables, but the more tables you link, the slower the query will process. Linking *queries* rather than tables for complex linkages can speed things up considerably.

- Add all the required tables or queries to your current query.
- Click and drag to define the relationships as described above.

The information given above is intended *only* as a "taster" of what's involved in creating relational databases. This is a topic which most people would find difficult to teach themselves either from online help or books. A structured course is emphatically the best way to learn.

# Tips and traps

## Access 97:

Compact and Repair are two separate commands from the Database Utilities menu option. If you're using 97 and your database is showing signs of corruption, Repair first and then Compact.

## Compacting and repairing databases

---

Compacting a database will never do it any harm! **Always do this when you have deleted items from a database.** The overall file size may not decrease as a result of your deletions until you compact – this is especially important if you have included and then deleted any pictures from your database.

An Access database file has a highly complex structure, and it may occasionally become corrupted. In addition to using the Compact and Repair utility to reduce file size after deleting records, run it if you're experiencing problems of any kind with your database file.

- From the **Tools** menu, select **Database Utilities**, then **Compact and Repair Database**.

## Including pictures in databases

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### Using pictures to improve form and report layouts

1. Open your form or report in Design View. Click in the section where you want the picture to appear. (See page 27.) An image placed in the Detail section will be repeated with every record.
2. Don't copy and paste pictures into Access – it can make your database file much larger than necessary. Save the picture to file, and use the Insert | Picture menu command.
3. The inserted picture will appear in the design grid. Use the picture control handles to move or resize (page 28).
4. If you want to use the picture as a *background image*: select the picture. From the **Format** menu, select **Send to Back**.

### Using Access to store pictures

Using Access to create a database for storing pictures isn't a simple project. These are just initial points to consider:

- Pictures can be stored within a database table if you have defined a field of the **OLE object** data type. However, a database file containing a lot of pictures may become very large and liable to corrupt. As a general rule, this approach should only be used if your database contains a very small number of records. Pictures stored as OLE objects will display in Forms or Reports, but not in datasheet view.
- An alternative is to organise picture files in a separate folder and define a *hyperlink field* in your table. You can then specify links to your picture files. You'll need to double-click the hyperlink to display your images – this can be done in datasheet as well as form or report view. If pictures are linked to a database file which you want to transfer to another location, the picture files must always accompany it.



## DOCUMENT CROSS-REFERENCE TO EUROPEAN COMPUTER DRIVING LICENCE (ECDL) SYLLABUS

The ECDL is an internationally accepted certificate of computing competence. The purpose of the table below is to set out what ECDL Database module requirements are; and to indicate how the content of this document maps to these requirements. **This document can be used as a supplement to ECDL learning materials, but not as a replacement.** You need experience in traffic before you can pass a driving test; in the same way you'll need practical experience of working with a fairly substantial database. Items are marked with an asterisk \* where this is particularly important to bear in mind.

Some topics are covered in greater depth by this document than is required by the ECDL syllabus. This applies particularly to database querying. The information about importing and exporting data and relational databases isn't covered in the ECDL syllabus.

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## Further references

Companion documents include *Making IT happen with MS Word; Making IT happen with MS Excel 2002*.