

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

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**Cambridge ICT Starters
Next Steps**

Scheme of Work

4281
Exploring Databases
Stage 1 Module



UNIVERSITY *of* CAMBRIDGE
International Examinations

Introduction

In this module, students will learn about the usefulness and basic structure of databases, how to enter and edit data in databases, and how to use them to search for and sort information.

What is Assessed in This Module?

Students will demonstrate how to

- add new records to a data file
- accurately enter numeric and text data into a database
- identify field types
- use search criteria to select required data
- use 'equals', 'more than' and 'less than' in searches
- re-phrase a given question in terms of search criteria
- interpret data

To Start This Module You Will Need

- a database package with a range of tools and edit features. Suitable software includes Microsoft Access (i.e. database from Microsoft Office/Works suite), the database from AppleWorks or an educational software database such as Information Workshop from the Black Cat Toolbox
- a set of record cards or blank cards which can be used to create a set of records
- pack/s game cards which can be sorted
- prepared databases with question sets which can be answered from them

Underpinning Knowledge

Before commencing this module it is recommended that students can:

- use the keyboard to enter numbers and text
- open software, recognise and use menus and buttons
- navigate to and open prepared files

General Principles and Procedures

The following are further suggestions and considerations:

- students need to be encouraged to understand and use the correct terminology
- students will benefit from viewing 'real world' examples of databases (e.g. from the web) but may need help in identifying the structure
- students should be encouraged into careful use of language when they write up any interpretations, trying to avoid sweeping statements
- students ought to have experience of the kinds of data entry they will meet in the real world, i.e. 'forced choice' using button selection or drop-down menus as well as 'open' entry, where any text or numeric field values may be keyed in. In using internet-based databases to find information, students will encounter such 'drop-down' menus as well as being asked to provide key words or phrases. Experience of varied forms of data entry will also help students who progress to designing databases in the On Track module 'Databases for a Purpose'
- real databases may contain a lot of information and, although it is not assessed specifically in this module, students should be shown how bar charts and pie charts can help us to understand some of the key features or patterns
- it is important for students to find the subject matter interesting, so that entering data does not become a chore

- for students to be able to turn real-life questions into search criteria for retrieving information from a database, they will benefit from practise and from seeing examples of how real-life databases are used. For example, how does the school librarian find out whether a book is loaned out or who has borrowed it?
- some database packages make it easy to view and enter all the information in a table format (like a spreadsheet) rather than using a data entry (record card) layout for each record. There is no stipulation which type must be used but the package chosen should, if possible, be suited to the age and ability of the students
- it's important to make sure that any sample databases used are large enough to ensure that students would be unlikely to identify all relevant records/ field values simply by looking at all the records without carrying out appropriate sort or search commands first
- make sure that any questions asked will generate usable results

Scheme of Work

Learning Objectives	Classroom Ideas	Resources	Notes
Session Plan One			
<ul style="list-style-type: none"> • understand some of the basic functions of databases • understand key terminology of databases • know that there are different data types such as: numbers, text or choices 	<ul style="list-style-type: none"> • create personal identity cards and use them to identify terminology and different data types • search for web pages which have data displayed from a database: <ul style="list-style-type: none"> - try to identify possible fields - what information would a single record hold - try to find examples of different field types: text, number, choices • discussion – ‘What is the purpose of a database?’ 	<ul style="list-style-type: none"> • a set of record cards e.g. the identity cards • access to web pages which display data from a database e.g. holidays, flights, webopedias 	<ul style="list-style-type: none"> • databases displayed in web pages can look very unlike a ‘standard’ database and students may need help in identifying the structure

Learning Objectives	Classroom Ideas	Resources	Notes
Session Plan Two			
<ul style="list-style-type: none"> • view, search and sort data in physical records • understand some of the benefits of computer databases over physical records • view search and sort data in a database • use sort and search skills to answer simple questions 	<ul style="list-style-type: none"> • students use the game cards to practise grouping and sorting to answer questions: <ul style="list-style-type: none"> - 'how many of ? type are there? - 'which character has ? and ? • different viewing, searching and sorting methods using a prepared database • students use sort and search skills to answer prepared questions from the database • discussion: What are the benefits of a computer database, compared to physical records? 	<ul style="list-style-type: none"> • game cards which can be sorted into various ways e.g. Pokemon • prepared database, e.g. a weather database • prepared question sheet relating to the database 	<ul style="list-style-type: none"> • structuring questions asked of physical records, so that they require resorting to find answers will help students to understand benefits of a computer database more easily • allowing students to use 'real objects' (i.e. the cards) to look at grouping, sorting, and classifying before they move onto a database will help them realise how much easier it is to find information when it is organised by agreed features (i.e. fields and field values)

Learning Objectives	Classroom Ideas	Resources	Notes
Session Plan Three			
<ul style="list-style-type: none"> • enter numeric and text data into a database • add and amend records in a database 	<ul style="list-style-type: none"> • demonstrate how to create new records and add data to a prepared database • students add and amend records using a prepared sheet or new data they have collected themselves 	<ul style="list-style-type: none"> • prepared database to which the students can add new records e.g. "Ourselves" • new data to input or data collection tools for the new records e.g. weighing scales, height measure 	<ul style="list-style-type: none"> • students will need to print out evidence for the changes that they have made to the database • students may need to be encouraged to work in an organised way • encourage students to routinely check their work for accuracy (a reasonable level of accuracy is required in assessment of this module)

Learning Objectives	Classroom Ideas	Resources	Notes
Session Plan Four			
<ul style="list-style-type: none"> • produce bar charts to show search results • make appropriate choices for displaying information • answer questions about the data • interpret data 	<ul style="list-style-type: none"> • demonstrate how to create bar charts and other charts • students create different charts from a selected field and discuss which is most appropriate • students discuss useful questions that can be answered from the data. They use searches and charts to draw sensible conclusions • students discuss the results of their searches and write some simple conclusions from the data they have examined 	<ul style="list-style-type: none"> • prepared database with data suitable to present in charts 	<ul style="list-style-type: none"> • students should be encouraged to notice that some field types lend themselves to graphical display and others do not • students should be encouraged to talk about or write about what each graph shows, even if they want to discard it

Learning Objectives	Classroom Ideas	Resources	Notes
Session Plan Five			
<ul style="list-style-type: none"> • ask sensible questions of data • rephrase questions in terms of search criteria 	<ul style="list-style-type: none"> • students work in small groups to construct questions which can be asked from the data. They note down the expected answers and the search criteria which could be used to find the information • students compile questions into a short question sheet (in MS Word and print copies for the other groups) • groups answer questions set by other groups: writing down both answer and search criteria used • groups collect and mark answers paying attention to which methods were used • class discussion to compile a class question sheet (of best questions) which test a full range of search and sort methods 	<ul style="list-style-type: none"> • prepared database 	<ul style="list-style-type: none"> • students should be encouraged to refine their questions so that they have a real context and get useful information out: <ul style="list-style-type: none"> - how much difference in height is there between the tallest and the shortest boy? - how many girls are below average height if the average is 5ft?

Assessment Ideas

To show how the Assessment idea fully incorporates the Learning Objectives tested, the Assessment Idea is cross-referenced with the Learning Objective table below.

Assessment Idea

Provide a prepared database with at least 6 fields and more than 20 records. Also, field types should be a mix of text, numeric, (Yes/No) or options with up to 6 values. The data should be relevant or interesting to the students and provide sufficient potential for a number of questions to be asked of it. Questions should be structured so that different search criteria (or combinations) are required and only generate a few records as a result.

The students should have the opportunity to enter a least 5 records (1). Students are asked to identify two field names giving the type of data they contain. (2) Students use the data to answer a range of questions; they write down both results (3) and the search criteria they use to obtain them (4). Student writes a short conclusion of what these results mean (e.g. an interpretation of the results of a search) (this may be for a new question) (5)

Stage 1 Module – Exploring Databases	
1	Add new records to a data file
2	Identify field types
3	Use 'equals', 'more than' and 'less than' in searches
4	Re-phrase a given question in terms of search criteria
5	Interpret data

Teachers should retain the following evidence for moderation:

- copy of original database/data and questions
- printout of additional records with any errors highlighted
- written answers from students (including search criteria used)

Resource List

Books

These are not books about databases, but resources that could provide students with facts and figures in order to build a database.

Title	Author	Publisher	ISBN	Year
The Planets in Our Solar System: Stage 2	Franklyn Mansfield Branley	Mass Market Paperback	006445178X	1998
Animal Encyclopedia	Barbara Taylor	DK Publishing	0789464993	2000

Websites

Creating and designing a database of class library books.

<http://ecs.lewisham.gov.uk/intict/pdf/activity10.pdf>

Databases and Modern Foreign Languages:

<http://curriculum.becta.org.uk/docserver.php?docid=1599>

Becta - Information handling for Learners with special educational needs

<http://www.becta.org.uk/inclusion/bdb/breakingbarriers/index.cfm?bnd=information&pg=information>

Data Types Quiz

<http://www.school-resources.co.uk/FramesForDataTypes.htm>

Database Quiz

<http://www.school-resources.co.uk/DatabaseQuiz.htm>

MAPE - Lesson resources for Databases

<http://www.mape.org.uk/kids/index.htm>

Census at School - data collection

<http://censusatschool.ntu.ac.uk/default.asp>

Vocab Poster: Databases

<http://www.primaryresources.co.uk/ict/pdfs/15post-data.pdf>

CD Roms and Software

Title	Publisher
Sparks - Spreadsheet, database, charting, data handling software	SPAsoft http://www.spasoft.co.uk/sparks.html
Junior Database - database software	IOTA software http://www.iota.co.uk/products/junior.htm
Junior PinPoint - data workshop	http://www.rm.com/Secondary/Products/Product.asp?cref=PD1015
FlexiData2 - database software	Flexible Software Ltd http://www.flexible.co.uk/FlexiDATA3.html
Textease Database - database software	Softase http://www.textease.com/database.htm
Pictorial databases - CD ROM Data processing with a historical theme	Computer Kids 1999
Information Workshop - database software	Black Cat software http://www.blackcatsoftware.com/catalog/products/infoworkshop.html