

Chapter 1

A Background on Databases and Their Uses in Schools

This chapter will provide the reader with a definition of a database and will discuss the history of databases. It will explain the basic structure of databases, including files, tables, forms, records, and fields. Examples of how databases are used in most jobs in business, industry, and education will be presented. The chapter will give teachers the rationale for using databases as tools to present, review, reinforce, and enhance curriculum.

Defining a Database

Humans have attempted to gather and organize data from the times of the first stories around the campfire, which were stored in the minds of the elders, to the advent of the printed word and creation of libraries with their card catalogs, and finally to the development of the computer. Computerized databases are collections of information that are organized by records and fields and can be easily searched to quickly retrieve the desired information by sorting or filtering the data. The simplest computer database is nothing more than an electronic filing system that can be easily searched and organized. Databases exist in hardcopy as well, such as a phone book or a set of index cards that students might use when taking notes for a research paper. The computerized database differs from the hardcopy database in that the computer database can be quickly reorganized. Those who remember the traditional card catalog system, which had been used in libraries for many years, will recall that there were at least two card catalogs—one alphabetized by author and title and the other organized by subject. Researchers spent hours searching the card catalog, reading the short descriptions of many books in order to find them on the library shelves. The computerized database systems that are currently in libraries have significantly simplified the research process.

To successfully search a database, it is important to understand how databases are organized. Databases are built from fields, records, and files.

- **Fields** represent one piece of information about the topic. For example, in a database of the U.S. states, a field could be the state name, capital, population, size (in square miles), population density, climate, or industries. In some database programs, fields are called categories. There are a variety of field types, including text, memo, numbers, times and dates, OLE objects (pictures), hyperlinks, auto-numbering, and lookup-wizards.
- **Records** are collections of related fields. For example, all of the information collected on one state would be considered a record.
- **Files** are collections of related records. For example, all of the data on all 50 states would be considered a file.

Chapter 3

Retrieving Data Using Sorting and Filtering Techniques

Sorting Data

Sorting data means to simply put the database in alphabetical or numeric order by a certain field. This function might be used to find the rainforest animal with the greatest length, to list the information in alphabetical order by its name, or to arrange records in a manner that will allow easy updating of records that might be missing data.

To introduce this concept to first-time database users, make cards for each record (in the following activity, each rainforest animal). Have students manually arrange the cards in order by name. This will take a while. Then demonstrate how the database sort function can perform this operation very quickly.

Sorting Activity Using the Rainforest Animals Database

1. Show students the Rainforest Animals database.

Rainforest Animals : Table						
Name	Active	Food type	Classification	Habitat	Length in mm	Weight in grams
African Elephant	day	herbivore	mammal	floor	73152	6350293
African Gray Parrot	day	herbivore	bird	canopy	520	550
African Leopard	night	carnivore	mammal	canopy & floor	1828.8	68038
African Mantid	day	carnivore	insect	floor	76.2	
African Termite	day	herbivore	insect	floor	0.5	22
Agouti	day	herbivore	mammal	floor, gap	4200	600

2. Define terms unknown to them, such as the various habitats. For example, you may need to explain that *floor* means forest floor.
3. Ask the question, "What is the longest animal in the rainforest?"
4. Click the **Length in mm** field to highlight it.
5. Click the **Z to A** icon to sort it in numbered order with the largest number first.

Students should notice that when the data is sorted by the field Length in mm, all data about one animal (one record) is sorted with the length.

Beginners can sort data from largest to smallest and then analyze the data. They may discover that larger rainforest animals are mammals or carnivores.

Chapter 5

Teacher and Classroom Uses for Databases

Teacher Uses for Databases

There are many ways teachers can use databases for personal productivity and classroom use. If Microsoft Access is not available, many spreadsheets have similar database functions.

Some possible uses for databases are:

- Searchable picture portfolio
- Grade book
- Student portfolio
- Parent list
- Checklist for money, book orders, or permission forms students must return.

As teachers, you often find pictures on the Internet to use in your instruction. You may also take photographs or have student work that could be scanned and put into a database. These pictures can be in a variety of subject areas. Because an Access database can store OLE objects, you can use it to easily create a searchable picture portfolio to store Internet pictures, photos, or scanned pictures. You can also create a custom slide show if one of the fields is a number field that is named "Sequence." Another field, named "Topic," can be filtered to include only pictures of mammals, for example.

I have included the Picture Portfolio database on the CD. This template can be used to create your own portfolio. Directions for editing the fields are included in the next section. For detailed directions on building a database that includes pictures, you can consult the directions for creating the Foreign Cultures database.

Explorers Database

Background

Name of database: Explorers

Number of records: 68

Number of fields: 10

Field names: Last Name, First Name, Date, Country, Country Represented, Why Explored, Transportation, Waterways, Discoveries, Notes

Keywords, field types, and notes on field names:

Date. This is the date of the first exploration available and is a number field.

Country and Country Represented. These fields include Denmark, England, Italy, Netherlands, Norway, Poland, Russia, Spain, and USA.

Why Explored. This field includes the following keywords: adventure, knowledge, land, religion, trade, art, and riches. An explorer may have explored for more than one reason.

Transportation. This field represents the main mode of travel.

Discoveries. This field lists important discoveries and is a memo field.

Notes. This field includes any other important or interesting facts about the person and his adventures.

Key terms students should know: circumnavigate, flora, fauna, charting.

Key concepts: Students should have a familiarity with location of continents and countries of the world. Students should know how to type letters with accent marks.

Curriculum integration: This database can be used in history and geography classes.

Typing Foreign Names

Some foreign names use accent marks. To use letters with accent marks, use the special character codes below.

ALT Code Shortcuts for International Characters

To use these codes, hold down the Alt key, and enter the numbers on the number pad (with num lock on).

Character	Keystrokes	Character	Keystrokes	Character	Keystrokes	Character	Keystrokes
Á	alt 0193	á	alt 0225	Ó	alt 0211	ó	alt 0243
Ä	alt 0196	ä	alt 0228	Ö	alt 0214	ö	alt 0246
É	alt 0201	é	alt 0233	Ú	alt 0218	ú	alt 0250
Ë	alt 0203	ë	alt 0235	Ü	alt 0220	ü	alt 129
Í	alt 0205	í	alt 0237	Ñ	alt 0209	ñ	alt 0241
ß	alt 225						

Sample Questions

Browse the database to answer the following questions.

1. How many records are in the database? _____
2. How many fields are in the database? _____
3. List the database field names.

Use the advanced filter to answer the following questions. Circle the clue words that will help answer the questions.

4. Where did Amundsen live? Where did he explore?
5. What isthmus did Balboa cross on foot? _____
6. What discoveries did Bridger make?
7. What river did Columbus explore? Where is the river?
8. DeSoto traveled on which river? _____
9. Which explorers came from Norway?
10. Vikings came from what countries? When did they live?