

## **A Database of Water**

*Jameel Abdul-Ghafūr*

### **INTRODUCTION**

Every day our world becomes more complex and demanding. To succeed beyond high school, students must be better prepared than ever. Our expectations for our students and our school are higher than they have ever been. To meet these expectations, the State Board of Education has adopted a new curriculum for all Texas schools, the Texas Essential Knowledge and Skills (TEKS). These learning standards will help ensure that all students meet the challenges ahead of us as we move into the next century.

The Texas Essential Knowledge and Skills guidance curriculums identify five fundamental outcomes that all Texas graduates must be able to demonstrate: effective reading; application of mathematics to complex problems; in depth understanding of sciences concepts in biology, physics and chemistry; citizenship; and an ability to use advanced technologies. This unit is designed for middle school students that are twelve, thirteen, and fourteen years of age. These students will be seventh and eighth graders that are enrolled in a technology application class. In the technology class all students will perform tasks that will allow the students to integrate technology into academics. In my classroom 12 percent of the students are Special Education, 46 percent are at risk, 19 percent are retained, 3 percent are Limited English Proficiency, and 79 percent are at an economical disadvantage. All students will have access to integrated software programs that includes a word processor, spreadsheet, relational database management system, and connection to the Internet. Two commercial examples of such integrated software packages are Lotus Office Suite™, and Word Perfect Office Suite™.

This unit will use the subject of water as a motivational theme to develop these fundamental outcomes identified by Texas Essential Knowledge and Skills. Water is chosen because all students are familiar with water in many forms – such as lakes, rivers, streams, and rainfall – but are unlikely to be familiar with its importance in all areas of civilization – from the health sciences to property law.

By researching the general topic of water with the goal to produce a useful relational database, students will increase their general knowledge about water, as well as exercise their reading skills, their mathematics skills (quantification of water at different scales), their science skills (physical and chemical properties), their citizenship skills (water as property and a shared resource), and their use of technology skills (the database).

This curriculum will provide training in the basic use of the Internet, creating a database, creating graphics, math, English, basic keyboarding, and a computer application program (Microsoft Access). It will also require the use of e-mail. At no time

will the students be required to program the computer or learn any programming language.

Each student will know the course objectives, classroom procedures, and job opportunities available. All students will increase their knowledge of water by researching the subject water. The class will accumulate data on water that will be used for information.

### **From Data to Information**

In this curriculum the data that will be collected on water can be divided into subsets. The subsets will be: Water and Property, Water and Environment, Water and Industry, Water and Agriculture, New Findings in Water, and any other subject related to water that may be created with a database.

The classes will be divided into small groups; each group will choose one subset to create a database from. Data will be created from preexisting database and new findings in water.

One group of students will create a database on Water and Property. The group will explore the ownership principles of water throughout the United States and the world. The group will create a database that lists the laws that governs ownership of water by an entity (individual, city, county, state, region, or country). The database will be created to show location of the water by a state, region, and country. Although a database could show the location of water that includes individuals, cities, and counties, I recommend using only two of each one of these entities (individuals, cities, and counties) so, as that the students may understand the logic, reasoning, and task of the activity. A database that lists the locations of all water for all entities would be behemoth and time consuming. The database should list ownership of the water, surface area of the water, and what rules governs the water.

The database will be used for decision-making, and it will incorporate graphics, graphs, and mathematical relations. The graphics and graphs will illustrate the laws that govern ownership of water by different types of entities. All students will create another graphics and graphs to illustrate the surface area of the water. The graphic(s) will be any graphic that students may pick or create that will represent the content of the information that he or she is presenting. The graphs will be a bar, pie chart, line, box, or multidimensional. All graphs will represent the data that has been collected for interpretation.

For those students that are enrolled in the class and have difficulty with math, it can be integrated in an activity that will be interesting and helpful to them. A procedure that is recommended and which I use is to give a class assignment so as each group will analyze the database and list mathematical relations that were created by the database.

After the group has listed the mathematics relations, the group will write the formulas of the mathematics relations. My students seem to be apprehensive about taking a test. I have noticed if I let the students create their own test questions and answers to the test questions, the students' retention of the subject seem to be better. All students must then list two mathematical questions related to the database that was created and then solve for the answer. When the students are finish with the questions and answers, they should submit the questions and answers to the instructor. The instructor will create a test with those type questions.

The "Database of Water" is a curriculum that has four strands: foundations, information acquisitions, problem solving, and communication.

Through the study of a database application program and the Internet foundation, including technology-related terms, concepts, and data input strategies; all students in my class will have the opportunity to increase their knowledge about water. Figure 1 is an illustration of what a student created database might contain. In database analysis, rows are called "records" and columns are called "fields." Each student will also have the opportunity to learn to make some informed decisions concerning water and some of the issues on the subject of water. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and access, analyze, and evaluate the acquired information. By using a database application program as a tool that supports the work of individuals and groups in solving problems, the students will learn how to query the database appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. The students will learn to communicate information by output from the database to a disk, computer, printer, screen, and/or any storage device. In addition students will analyze and evaluate the results.

## **Foundations**

The preponderance of my students does not know the parts of a computer. Although the mainstream of my students have used a computer while they were in elementary school and played games on a computer exponential, but if I ask them to place their hands on the computer, majority of the students in the class will place their hands on the monitor. So as to be in compliance with TEKS, which states, "students must learn to demonstrate knowledge and appropriate use of hardware components, software programs, and their connections," the students take notes and they are issued a handout as I name each part of the computer, the function of each part, where each component of the hardware is connected, and how each component is connected so as to have a computer system. I will instruct the students to follow me as I model to the class how to "boot" the computer and the correct way to shut down the computer. I will then "boot" the computer one more time and model to the students how to open a software program. The application program with which I begin the students learning about Technology Application is a Paint or Draw program. I have the students to start using the Paint software program because, at this

point I get to reinforce learning of the hardware components I have named, students are introduced to a software program, students get to practice what I have modeled by drawing and labeling the parts of a computer system, and the students are captured by doing something with the computer that they had previously enjoyed doing with coloring pencils and paper. I have an illustration with labels and connections of a computer system in my classroom that the students may use as a point of reference to draw in the Paint or Draw software program. I allow approximately three 90-minute sessions for all students to finish this task.

Another task students seem to derive pleasure from is the Internet. The Internet is very much part of creating a database on water. The Internet is the source of most of the data the students will be using. Most students have some of the skills to use the Internet. They have been using the Internet since elementary school to search for and play games or music. After teaching, re-teaching, modeling, and practicing terminology about the Internet and using the Internet, all students should be knowledgeable of terms that are associated with Internet usage. Some of the terminologies that are associated with Internet usage and adherence to TEKS are: electronic mail (e-mail), Uniform Resource Locators (URLs), electronic bookmarks, local area networks (LANs), wide area networks (WANs), World Wide Web (WWW) page, and HyperText Markup Language (HTML). My next task for the students is an Internet assignment. I will instruct the students to search the Internet and write seven paragraphs on water and to list three different sources they used to find their information on the Internet. The student's writing assignment must answer the questions, What is water? Where is water found? How much water is it? And why do we need water? This assignment will take my students approximately three 90-minute sessions to complete.

The next task is for the students to learn is to create a database. The database program I use in my classroom is Access. Access is one of the Microsoft Office™ application programs, but many inexpensive database program that will run on your computer operating system may work. *Read the section "New Program" for strategies on purchasing a software program.*

### **New Program**

If it becomes necessary to purchase a software database program to load on the computer, there are some strategies that are helpful. Ask the following questions: Do we need the software? It is important that the software meet a general course requirement? Does this software meet that requirement? Will the software operate on a network system? What operating system must be used with the software? What are the copyright laws concerning the software? It is vital for the software to comply with the curriculum requirement that is set by the State's Education Commission? It would not help to promote maximizing learning of my students if the software is not challenging enough mentally or too advanced for my students to promote academic acceleration. So, does the software meet the requirements for my students? On the packs of computer software

there a label title “Specification.” The specification will list hardware and software requirements to run the software programs. If the computer lab will not meet the specification of the software, then it is little or no use for my class. I will need to know, what service I will get after the sale. Does the software come with a warranty, technical support, and updates? The least important strategy should be the cost of the product. If it is not within my school campus budget, I should be able to order the application software from the school district or access the software from the district server.

### **Information Acquisition**

Data is raw facts or truths about an entity – in this task the entity is water. Once that data has been interpreted to have meaning and become an answer to some question(s), it is said to be information. My students will be acquiring data about water. The user of this database will extract the data from the database by querying or sorting and the data will then be information. The student will use a variety of strategies to acquire data from electronic resources, with appropriate supervision. Some of the strategies student are expected to use to locate and acquire desired data are: keyword, link(s), web address, and/or Boolean.

The students will acquire electronic data in a variety of formats, with appropriate supervision. The student is expected to identify, create, and use files in various formats such as text, bitmapped/vector graphics, image, video, and audio files.

After the students have acquired the electronic data, the students will evaluate the electronic data. The students will determine and employ methods to evaluate the electronic data for accuracy and validity. A method to evaluate the data for validity is to check the resource. If the resource is permissible by TEKS, then the resource is said to be valid. Some agencies that acquire valid resource of data are city, state, county, and United States Government web sites. The students can check for accuracy of the data by rechecking the data fields, check the mathematical formulas, and checking for mathematical relations. Any data conflicts will be resolved through validating data through accessing, researching, and comparing data. The students will identify the source, location, type, relevancy, and content validity of the available data or information.

### **Solving problems**

It will be necessary for the students to uses appropriate computer-based productivity tools to create and modify solutions to problems. All students will plan, create, and edit databases by defining fields, entering data, and designing layouts appropriate for reporting. As an example after the groups have created their databases and enter data into the databases, it may become necessary to go back and edit the database with a total new field. The new field may be necessary because of the acquiring of new data to be entered in a total new category.

The advantage of having many groups of students to create many databases on water as we possible can and then merge those databases, we will be closer to new knowledge. The disadvantage is we can run out of computer, before we obtain the new knowledge.

All groups in my class will communicate with the electronic community. By communicating with the electronic community the group will have the opportunity to have access to more data and increase their writing skills. Without proper use of the computer a large number of people are already communicating with the electronic community. They are communicating by electronic communication (e-mail), Bulletin Boards and the chat rooms.

The groups of students will use the database application to facilitate evaluation of work, both process and product. They will have a field(s) in the database design to track trends, set timelines, and review/evaluate progress for continual improvement. By having these fields in the database it will allow the group to resolve information conflicts and validate information through research and comparison of data.

### Communication

There are many ways to communicate the database when it is completed. The database can be communicated by slide shows, multimedia presentation, newsletters, brochure, posters, or reports. When communicating the database you must first define your audiences. The students in my group will communicate the water database by reports, charts, and graphs. Because of the size of the water database the group will be allowed to practice with a variety of layouts, including horizontal and vertical the group will be instructed on how to select the best layout, using strategies based on readability, purpose of reports, and data that has to be query. And then each group will choose the appropriately layouts.

<b>Inorganic Contaminants</b>				
<b>Contaminant Name</b>	<b>MCL<sup>1</sup> (mg/L)</b>	<b>MCLG<sup>2</sup> (if applicable) (mg/L)</b>	<b>Potential Source(s)</b>	
Antimony	0.006	0.006	<b>Commercial / Industrial</b>	Electrical / Electronic Manufacturing, Fire Retardants, Metal Plating / Finishing / Fabricating, Petroleum Processing, Synthetics / Plastics Production
Arsenic	0.05	None	<b>Commercial / Industrial</b>	Automobile Body Shops / Repair Shops, Chemical / Petroleum

				Processing, Construction / Demolition, Electrical / Electronic Manufacturing, Fleet / Trucking / Bus Terminals, Food Processing, Home Manufacturing, Machine Shops, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Military Installations, Photo Processing / Printing, Research Laboratories, Retail Operations, Wood / Pulp / Paper Processing
			<b>Residential / Municipal</b>	Airports (Maintenance / Fueling Areas), Golf Courses and Parks, Landfills / Dumps, Public Buildings and Civic Organizations, Schools, Utility Stations
			<b>Agricultural/Rural</b>	Orchards, Herbicides, Erosion of Natural Deposits
Asbestos	7 million fibers per Liter	7 million fibers per Liter	<b>Commercial / Industrial</b>	Construction / Demolition, Erosion of natural deposits
Barium	2	2	<b>Commercial / Industrial</b>	Automobile Body Shops / Repair Shops, Cement / Concrete Plants, Chemical / Petroleum Processing, Dry Goods Manufacturing, Electrical / Electronic Manufacturing, Fleet / Trucking / Bus Terminals, Furniture Repair / Manufacturing, Hardware / Lumber / Parts Stores, Home Manufacturing, Junk / Scrap / Salvage Yards, Machine Shops, Office Building / Complex, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Military Installations, Photo Processing / Printing, Railroad Yards / Maintenance / Fueling Areas, Research Laboratories, Retail Operations, Synthetics / Plastics Production, Underground Storage Tanks, Wood / Pulp / Paper Processing

			<b>Residential / Municipal</b>	Airports (Maintenance / Fueling Areas), Landfills / Dumps, Public Buildings and Civic Organizations, RV / Mini Storage, Utility Stations, Erosion of natural deposits
Beryllium Powder	0.004	0.004	<b>Commercial / Industrial</b>	Research Laboratories, Metal Plating/Finishing/Fabricating, Coal-Burning Factories, Electrical/Electronic Manufacturing, Aerospace and Defense Industries
			<b>Residential / Municipal</b>	Public Buildings and Civic Organizations, Schools
Cadmium	0.005	0.005	<b>Commercial / Industrial</b>	Automobile Body Shops / Repair Shops, Boat Repair / Refinishing, Chemical / Petroleum Processing, Construction / Demolition, Drinking Water Treatment, Dry Goods Manufacturing, Electrical / Electronic Manufacturing, Fleet / Trucking / Bus Terminals, Food Processing, Hardware / Lumber / Parts Stores, Home Manufacturing, Machine Shops, Metal Plating / Finishing / Fabricating, Military Installations, Office Building / Complex, Photo Processing / Printing, Medical / Vet Offices, Railroad Yards / Maintenance / Fueling Areas, Research Laboratories, Retail Operations, Synthetics / Plastics Producers, Underground Storage Tanks Wood / Pulp / Paper Processing
			<b>Residential / Municipal</b>	Airports (Maintenance / Fueling Areas), Landfills / Dumps, Public Buildings and Civic Organizations, Schools, Utility Stations, Wastewater
Chromium	0.1	0.1	<b>Commercial / Industrial</b>	Metal Plating / Finishing / Fabricating, Erosion of natural deposits
Copper	TT <sup>3</sup>	1.3	<b>Commercial / Industrial</b>	Automobile Body Shops / Repair Shops, Chemical / Petroleum Processing, Construction / Demolition,



				Dry Goods Manufacturing, Electrical / Electronic Manufacturing, Food Processing, Hardware / Lumber / Parts Stores, Home Manufacturing, Junk / Scrap / Salvage Yards, Machine Shops, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Office Building / Complex, Photo Processing / Printing, Synthetics / Plastics Producers, Transportation Corridors, Wood / Pulp / Paper Processing , Erosion of natural deposits
Cyanide	0.2	0.2	<b>Commercial / Industrial</b>	Chemical / Petroleum Processing, Construction / Demolition, Electrical / Electronic Manufacturing, Fertilizer Factories, Fleet / Trucking / Bus Terminals, Machine Shops, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Photo Processing / Printing, Research Laboratories, Synthetics / Plastics Producers
			<b>Residential / Municipal</b>	Waste Water Treatment, Public Buildings and Civic Organizations, Schools, RV / Mini Storage, Utility Stations
Fluoride	4	4	<b>Commercial / Industrial</b>	Construction / Demolition, Fertilizer Factories, Aluminum Factories
			<b>Residential/Municipal</b>	Drinking Water Treatment additive, Erosion natural deposits
Lead	TT	0.015	<b>Commercial / Industrial</b>	Automobile Body Shops / Repair Shops, Boat Repair / Refinishing, Cement / Concrete Plants, Chemical / Petroleum Processing, Construction / Demolition, Dry Goods Manufacturing, Electrical / Electronic Manufacturing, Fleet / Trucking / Bus Terminals, Food Processing, Furniture Repair / Manufacturing, Hardware / Lumber / Parts Stores, Home Manufacturing, Junk / Scrap / Salvage Yards, Machine Shops, Medical / Vet Offices, Metal Plating / Finishing / Fabricating,

				Military Installations, Mines / Gravel Pits, Office Building / Complex, Photo Processing / Printing, Railroad Yards / Maintenance / Fueling Areas, Research Laboratories, Retail Operations, Synthetics / Plastics Producers, Underground Storage Tanks, Wholesale Distribution Activities, Wood Preserving / Treating, Wood / Pulp / Paper Processing
			<b>Residential / Municipal</b>	Airports (Maintenance / Fueling Areas), Drinking Water Pipe Corrosion, Golf Courses and Parks, Landfills / Dumps, Public Buildings and Civic Organizations, Schools, Utility Stations, Wastewater, Erosion of natural deposits
Inorganic Mercury	0.002	0.002	<b>Commercial / Industrial</b>	Automobile Body Shops / Repair Shops, Boat Repair / Refinishing, Chemical / Petroleum Processing, Electrical / Electronic Manufacturing, Fleet / Trucking / Bus Terminals, Food Processing, Furniture Repair / Manufacturing, Hardware / Lumber / Parts Stores, Home Manufacturing, Machine Shops, Office Building / Complex, Photo Processing / Printing, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Military Installations, Railroad Yards / Maintenance / Fueling Areas, Research Laboratories, Retail Operations, Synthetics / Plastics Producers, Wood / Pulp / Paper Processing
			<b>Residential / Municipal</b>	Airports (Maintenance / Fueling Areas), Landfills / Dumps, Public Buildings and Civic Organizations, RV / Mini Storage, Schools, Utility Stations, Wastewater
			<b>Agricultural / Rural</b>	Crops - Irrigated + Non irrigated, Erosion of Natural Deposits
Nitrate	10	10	<b>Commercial /</b>	Boat Repair / Refinishing, Historic

			<b>Industrial</b>	Waste Dumps / Landfills
			<b>Residential / Municipal</b>	Apartments and Condominiums, Camp Grounds / RV Parks, Golf Courses and Parks, Housing, Landfills / Dumps, Septic Systems Waste Transfer / Recycling, Wastewater
			<b>Agricultural / Rural</b>	Auction Lots / Boarding Stables, Confined Animal Feeding Operations, Crops - Irrigated + Non irrigated, Lagoons and Liquid Waste, Pesticide / Fertilizer / Petroleum Storage Sites, Rural Homesteads , Erosion of Natural Deposits
Nitrite	1	1	<b>Commercial / Industrial</b>	Boat Repair / Refinishing, Historic Waste Dumps / Landfills
			<b>Residential / Municipal</b>	Apartments and Condominiums, Camp Grounds / RV Parks, Golf Courses and Parks, Housing, Landfills / Dumps, Septic Systems, Waste Transfer / Recycling, Wastewater
			<b>Agricultural / Rural</b>	Auction Lots / Boarding Stables, Confined Animal Feeding Operations, Lagoons and Liquid Waste, Pesticide / Fertilizer / Petroleum Storage Sites, Rural Homesteads, Crops - Irrigated + Non irrigated, Erosion of Natural Deposits
Selenium			<b>Commercial / Industrial</b>	Chemical / Petroleum Processing, Construction / Demolition, Electrical / Electronic Manufacturing, Fleet / Trucking / Bus Terminals, Furniture Repair / Manufacturing, Home Manufacturing, Machine Shops, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Military Installations, Mines / Gravel Pits, Office Building / Complex, Photo Processing / Printing, Research Laboratories, Synthetics / Plastics Producers, Wood / Pulp / Paper Processing, Erosion of Natural Deposits

			<b>Residential / Municipal</b>	Airports (Maintenance / Fueling Areas), Landfills / Dumps, Public Buildings and Civic Organizations, Schools, Wastewater
Thallium	0.002	0.0005	<b>Commercial / Industrial</b>	Electrical / Electronic Manufacturing, Medical / Vet Offices, Metal Plating / Finishing / Fabricating, Research Laboratories

**Figure 1:** The above box is an example of a database that lists some of the attributes of Water Quality and a list of Inorganic containments in water. This database could be expanded to include Organic containments, Micro-Organisms, Radio nuclides, and Secondary Drinking Water Containments. By creating databases in groups each group is allowed to create their own database. The groups databases can later be merge to one large database.

## LESSON PLANS

Throughout the lesson plans I use the following method:

- Teach
- Model
- Reteach
- Practice
- Test
- Questions and answers

### Lesson Plan One: Getting Started

#### *Student Objectives*

This lesson is for a first year technology application class. The students will learn some of the basic operations and terminology of the computer. Have the students to learn how to format a disk, save data to a disk, and retrieve data from a disk.

- Boot and shut down a computer.
- Name the parts of computer and the connections.
- Format a disk.
- Label a disk.
- Open the paint software program.
- Draw the computer and label all connections.
- Edit the drawing.
- Save and close the Paint software program to a floppy disk.
- Retrieve information from a floppy disk.

### ***Resources and Materials***

- Computer system
- Paper and pencil/pen
- Diskette
- Printer
- Overhead projector
- Transparencies

### ***Homework***

Use the buddy system, contact a classmate and discuss the notes that were taken in class today.

## **Lesson Plan Two: Water and the Internet**

### ***Student Objective***

In this lesson students will learn some of the basic operation and terminology of the use of the Internet. The students will use the Internet to research for data on water to be entered in the Database. Have each student in the class to create an E-mail address to communicate with others outside the classroom.

- Open an Internet browser
- Define and use URL
- Define and use Hypertext Markup Language
- Define and use Search Engine
- Define and use World Wide Web
- Define and use LAN
- Define and use Electronic Mail
- Internet scavenger hunt

### ***Resources and Materials***

- Computer system
- Paper and pencil/pen
- Diskette
- Printer
- Overhead projector
- Transparencies

### ***Homework***

Use the buddy system, contact a classmate and discuss the notes that were taken in class today.

## Lesson Plan Three: Water and Database

### *Student Objectives*

The technology application class will follow the teacher instructions as the teacher model and explain to students the directions in creating a database document. The teacher may use an overhead projector if she or he does not have a multimedia projector. It would be helpful if the instructor model to the class the different ways to open a file (i.e. to select the file from the pop-up menu or to select the icon on the desktop). Some students will have to be taught when selecting the file from the desktop it may be necessary for them to double-click the program icon.

- Open a database application program (Access)
- Create a *database*
- Create *fields* in a database
- *Edit* a database
- Generate a *report*
- *Sort* a database
- Generate a *graph*
- Generate a *chart*
- Use *find* command
- *Save* a database
- Create a database on water
- Use the Internet

The instructor should now have students open the database program; the program will open a database window with no name. Instruct all students to click blank database that is in the “New File” menu. After clicking blank database the user will get another window with the title “File New Database.” I have found that this point is a good opportunity to illustrate and explain to students the function of this window “File New Database.” Some of the main points about this window the students should know are the following: it allows the user to name their file, save their file to a location, determine the type of file, and delete all files that are not wanted. After I am finished explaining to the class about the “File New Database” window, I ask the class, “Do anyone have any questions about the procedures that we just went through?” If anyone says yes, I will explain to that student the part of the instructions they do not understand. If everyone says no, I will give the class approximately ten minutes to practice the methods that I have taught them. By allowing the students to practice the procedures that were taught, it reinforces learning, the instructor will notice that some students did not really understand the procedure, and it will allow the instructor to adjust any needed teaching before continuing instructions.

After practicing the student will click on the create button at the “File New Database” window. The students will now be at the “Database Format” window. The database file window list three ways to create a table; create a table in Design view, create a table

using wizard, and create a table by entering data. Since this is a beginners course in technology application for seven and eight graders, I recommend to the instructor to use create a table in Design view. It is advantageous to the students if the instructor selects “create a table in Design view.” By selecting this, the students will have the opportunity to specify the information that they want to track. The “create a table in Design view” is better for this age group, because of their short attention span; the group will better understand the mechanics of the database.

The students now have selected “create a table in Design view.” They are now looking at a screen with rows and columns; it is a “Table.” On the “Table Window” there are three important information headings in the columns; Field Name, Data Type, and Description; and two subheadings; “General” and “Lookup.”

I recommend to my students to perform and list each step-by-step procedure as I explain and model to the class each heading in the “Table Window.” By allowing the students to list each step-by-step procedure I am allowing the students to practice their writing and spelling skills. I commonly will use two forty-five minutes class session explaining and modeling to the students. After I finish explaining and modeling to the class; the students will be allowed to practice that which has been taught to them.

In the practice session the teacher should have a handout to give the students to practice with. I always hand out to the students source materials with a list of characters that are alphabets, numbers, symbols, and alphanumeric combinations. Since, this database is going to be on water, the local, state, or federal government is a good source of reference for source materials on water. The teacher should observe closely the students’ application and analyses skills in the practice session. The application and analyses skills are important in matching the correct data to the Data Type Field. If incorrect data is applied to the wrong Data Type Field it will give the user of the data wrong information or no information. As the students practice, the teacher will observe the students’ methods and procedures. The teacher will offer assistance as needed. One of the procedures that work well for me is to encourage the students to take a chance they are correct and it is “okay” for them to make an error in the classroom. Sometimes students believe if they make an error they have done something wrong and they will be held accountable. I recommend the students be given approximate one forty-five minutes practice session. I vary the length of practice time depending on students keyboarding skills, and how well the class can associate old words to the application of new technology.

After allowing the class to practice the next step is to name, save, and to select “Datasheet view” for the table. The students can now enter data into the datasheet. The teacher should be cognizant of the students entering data into the alphanumeric fields. It has been my past experience that only a few students created the alphanumeric fields correct. The common mistake that most students make is to create the alphanumeric fields either alpha or numerical. Depending on the size of the database, the error rate of

the students, the key stroking skills of the students, the configuration of the database, and incorrect application of principle it could take the students three forty-five minutes session or longer to enter data into the database. Because my students seem to learn large chunks of information in small bits I have the students to create many small databases. Each small database will have added attributes that build on the knowledge of the students previous learn skills of creating a database. Each database will be created on "water." After crating and saving all databases, the next procedures are the questions-and-answers session.

The Q&A is a time to get feed back from all students, to give comments on methods and procedures that have been observed, and to review before Test time. The topic that I commonly have to reinforce the most is the recognition, creation, and application of fields.

My test will be an activity test on water where the student must read, write, perform, recall, analyses, apply, and evaluate. With my activity test I will give the students a rubric.

### ***Resources and Materials***

- Computer system
- Paper and pencil/pen
- Diskette
- Printer
- Overhead projector/Multimedia projector
- Transparencies
- Notebook or Folder

All resources and materials are provided by my district. I recommend a Pentium III, Internet service, network service, and network printers.

### **Homework Assignment**

Use the buddy system, contact a classmate and discuss the notes that were taken in class today. Read a technology article on water.

I have a few reasons for giving homework assignments: (1) my school district requires I give homework, (2) my students need to read more, and (3) my students need to interact positively with other students, especially students that will not normally interact. By reading a technology article it gives the class to discover and discuss new technology. Those articles that are very interesting to the class, and I often create lesson plans based on those articles.



## ANNOTATED BIBLIOGRAPHY

### Reading Resources

Shelly, Gary B., Thomas J. Cashman, and Gloria A. Waggoner. *Discovering Computers*. Course Technology, 1998.

Information on exploring computers. ISBN: 0-7895-1297-1; Library of Congress catalog card number: 97-65049.

Robinson, Celeste. *Access 97: No Experience Required*. 1st ed. Sybex, 1997.

Focuses on the sixteen most essential Access skills. Lots of graphics and step-by-step examples. ISBN: 0-7821-2150-0; EAN: 9 780782 121506; UPC: 0252-11-221501

Courter, Gini and Annette Marquis. *Mastering Microsoft Outlook 98*. 1st ed. Sybex, 1998.

*Mastering Microsoft Outlook 98* shows you how to take advantage of all the features. ISBN: 0-7821-2276-0; EAN: 9 780782 122763; UPC: 0252-11-222768.

Tauber, Daniel A. and Brenda Kienan. *Surfing the Internet with Netscape Communicator 4*. 1st ed. Sybex, 1997.

ISBN: 0-7821-2055-5 EAN: 9 780782 120554 UPC: 0252-11-220559.

How-to and reference for beginning and intermediate levels.

Dyson, Peter. *Windows 98 Instant Reference*. 2nd ed. Sybex, 1999.

*Windows 98 Instant Reference* contains the essentials for use plus more general knowledge about computers and the Internet. ISBN: 0-7821-2617-0; EAN: 9 780782 126174; UPC: 0252-11-226179.

Perspection, Inc., ed. *Microsoft Access 97 at a Glance*. Microsoft Press, 1997.

*Microsoft Access 97 at a Glance* lets you focus on a particular task and shows you with clear, numbered steps. ISBN: 1-57231-369-2.

Joyce, Jerry and Marianne Moon. *Microsoft Word 97 at a Glance*. Microsoft, 1997.

*Microsoft Word 97 at a Glance* lets you focus on a particular task and shows you with clear, numbered steps. ISBN: 1-57231-366-8.

Dudley, Christina and Joyce Cox. *Quick Course in Microsoft Windows 98*. Online Press, 1998.

For beginning and intermediate levels. ISBN: 0-7356-1078-9.

## Internet Resources

<http://www.epa.gov/ebtpages/pollutants>

*Pollutants and Toxics*. January 04, 2003.

Contains source references to web pages on chemicals, organisms, and other pollutants and toxics that are found in water.

<http://ga.water.usgs.gov/edu/>

*Water science for schools*. September 20, 2002.

Offer information on many aspects of water, along with pictures, data, maps, and an interactive center where you can give opinions and test your water knowledge.

<http://water.usgs.gov/>

*Water resources of the United States*. November 13, 2002.

The water resources of the United States.

<http://www.nal.usda.gov/wqic/>

*Water Quality Information Center*. November 29, 2002.

Water related databases.

<http://www.unesco.org/water/>

*United Nations Educational Scientific and Cultural Organization*. 2001.

Unescos water portal coordinates and provides database access and worldwide information on freshwater, including scientific policies, programmes, water forums, etc.

<http://water.usgs.gov/realtime.html>

*Real-Time Water Data*. June 28, 2002.

USGS Real-Time Water Data site!

<http://txwww.cr.usgs.gov/>

*USGS Activities In Texas*. November 20, 2002.

Biological research projects in Texas water quality in South-Central Texas, 1996-98. NAWQA summary report. Real-Time Water Data.