VITAL INFORMATION

Subject(s): Careers, Computer Fundamentals 1-2

Topic or Unit of Study: Integrated Unit

Grade/Level: 9-12

Objective: At the conclusion of this lesson students will be able to:

1. List ways that Information Technology relates to each of their courses at school.

2. Explain how they can document or demonstrate the relationships.

3. Identify the particular kinds of Visual Basic controls that would make the documentation or demonstration possible.

Summary: Students brainstorm and research ways in which Information Technology relates to the subjects they are studying in school. They itemize the relationships, and then for a selected portion they plan documentation or demonstration of the relationship. For example, computers can be used to draw complicated geometric figures (CAD/CAM), they can provide information on famous geometers (see Wikipedia under geometer), and they can calculate coordinates of points that have been reflected across axes. These could be documented by showing pictures of the geometric figures, linking to web pages reporting on the geometers, or writing a program to perform the reflections. For each subject, students pick at least one interesting and feasible documentation or demonstration method, identify the Visual Basic controls that are required for implementation, and collect needed resources (URLs, pictures).

IMPLEMENTATION

Learning Context: Computers are related to almost everything nowadays and every computer program we've worked on has been related to something out in the real world, if only the myriad other versions of the same program. However, students may not have had significant contact with computers in the very classes that they are currently studying on a daily basis. For example, students do not regularly use a computer in English or history class, I am told. The need to know the connections is evidenced in state-issued technology standards, the demand for information technologists with domain expertise, and I suspect grades of students who can use technology to their advantage in their school work. I want to impress upon students that although they may not become career computer programmers, the more they can get out of a computer, the better off they will be no matter what they study or work on.

Procedure:	1. The activity is written up in fairly fine detail on a web page which is printed and attached to this lesson plan and which students should read. It supplies an introduction, includes a screen shot of the application, shows model entries in a table which students can copy into Word, describes user interface controls which students have at their disposal, and specifies requirements of their research. 2. Ensure that students can find the web page for later reference, lead a discussion of the material on the page, and start collecting ideas from students. 3. As mentioned on the web page, there are many sources of ideas, but I suggest brainstorming sessions in class. For one or two departments per day write on the board the names of all classes that the students have. Collect ideas that are contributed so that other students can also use them. Add a few teacher-generated ideas when necessary, and also ask where additional details might be found or how the relationship can be demonstrated. Take a picture of the board when it is full and add it to the web page under a tab for each class, so that students can refer to it later. All students will be taking a single course in the Computer department. They will be given a "free space" for that class period's tab in the program. They can do whatever they want with it. 4. In cases where internet research is indicated, allow time to search for URLs of web sites and pictures. Also, the first five activities that are part of this integrated unit do not yet involve student research, but rather teach about user interface controls. Therefore, after students have brainstormed long enough, the results can be summarized and documented, and students can be put to work on the user interface.
Differentiated Instruction:	There is little differentiation in instruction, but an expectation that the products are differentiated because of differing courses, schedules, and interests.
Sample Student Products:	Only the teacher's model answers are available presently.
Collaboration:	Students will work individually.
Time Allotment:	1 class period. 55 Min. per class.
Author's Comments & Reflections:	Reflections will follow in a diary entry. Re. collaboration: Students participate in group discussions, but in the end hand in their own individual work. Re. time allotment: approximately 10 minutes per department on subsequent days. Re. standards: Whether some of these standards are addressed depends on whether students find particular relationships or not. Several have to do with relationships with other subjects.

MATERIALS AND RESOURCES

Instructional Materials:

A printout of the web page for the activity is attached.

Attachments

1. **Computer Integration**

Resources:

STANDARDS & ASSESSMENT

Standards:

AZ- Career and Technical Education Programs

- **Level :** Career Preparation (Grades 10 - 12)
  - **Program :** Information Technology CIP No. 15.1200
    - **Option :** Software Development - Option C
      - **Competency :** *1.0 CONDUCT A CAREER SURVEY FOR INFORMATION TECHNOLOGY
        - **Indicator :** 1.1 Use technology to research information technology career path information
        - **Indicator :** 1.2 Identify interests, skills and abilities contributing to success in careers in the information technology fields
      - **Competency :** *4.0 DEVELOP EMPLOYABILITY SKILLS FOR THE INFORMATION TECHNOLOGY INDUSTRY
        - **Indicator :** 4.1 Identify math and language skills required in an information technology workplace
      - **Competency :** *5.0 EXPLORE COMMUNICATION SKILLS IN AN INFORMATION TECHNOLOGY ENVIRONMENT
        - **Indicator :** 5.3 Give suggestions and/or ideas in an appropriate manner
      - **Competency :** *8.0 MAINTAIN A SAFE INFORMATION TECHNOLOGY WORK ENVIRONMENT
        - **Indicator :** 8.2 Safely use the tools, materials and equipment commonly utilized in the field of information technology
      - **Competency :** *12.0 EXPLORE LEGAL AND ETHICAL ISSUES RELATED TO INFORMATION TECHNOLOGY
        - **Indicator :** 12.1 Explore issues regarding intellectual property rights including copyright, software licensing and software duplication
      - **Competency :** 14.0 DEVELOP AN INDIVIDUAL CAREER PLAN FOR THE INFORMATION TECHNOLOGY INDUSTRY
        - **Indicator :** 14.1 Investigate career options
        - **Indicator :** 14.2 Develop career goals based on interests, aptitudes and research
      - **Competency :** 16.0 PARTICIPATE IN INFORMATION TECHNOLOGY WORK-BASED LEARNING EXPERIENCES
        - **Indicator :** 16.1 Use technology appropriate for a job in information technology
      - **Competency :** 18.0 DEMONSTRATE WRITTEN COMMUNICATIONS SKILLS APPLICABLE TO AN INFORMATION TECHNOLOGY ENVIRONMENT
        - **Indicator :** 18.1 Conduct formal and informal research to collect appropriate topical information
        - **Indicator :** 18.2 Organize information and develop an outline
        - **Indicator :** 18.3 Write business communication using appropriate format for the situation
      - **Competency :** 24.0 DEMONSTRATE THE COMPREHENSION OF BASIC COMPUTER MATHEMATICS REQUIRED FOR INFORMATION TECHNOLOGY
        - **Indicator :** 24.1 Explain the function of general mathematics as it relates to computer hardware

- **Indicator :** 24.2 Perform binary to decimal, decimal to hexadecimal, hexadecimal to decimal, binary to hexadecimal and binary to hexadecimal conversions as needed to solve problems with hardware and software

• **Competency :** 25.0 DESCRIBE THE DEVELOPMENT/EVOLUTION OF THE COMPUTER

- **Indicator :** 25.2 Explain the historical evolution of the computer and computer networks
- **Indicator :** 25.3 Explain how the development of computers has impacted modern life

Assessment/Rubrics: The table that students produce is evaluated according to the ComputerIntegration rubric. It is concerned with columns four, five, and six of the table. Other requirements, for instance of URLs and pictures and written documentation, are evaluated when the corresponding controls are added to the application.

Rubrics

1. **Computer Integration**