Crawford County School-To-Work Partnership
2002 Educator-in-the-Workplace Program
Lesson Plan

Name: ***Judith M. Johnson***
School: ***Penncrest School District Substitute***
Subject Area: ***Biology***
Lesson: ***Why Do We Study Biology?***
Date: ***8/10/02***
Business Visited: ***Meadville Medical Center***

A. Academic Standards Addressed

Reading, Writing, Speaking and Listening

1.1.11A Locate various texts, media and traditional resources for assigned and independent projects before reading.
1.1.11C Use knowledge of root words and words from literary works to recognize and understand the meaning of new words during reading. Use these words accurately in speaking and writing.
1.1.11E Establish a reading vocabulary by identifying and correctly using new words acquired through the study of their relationships to other words. Use a dictionary or related reference.
1.1.11F Understand the meaning of and apply key vocabulary across the various subject areas.
1.1.11G Demonstrate after reading understanding and interpretation of both fiction and nonfiction text, including public documents.
1.1.11H Demonstrate fluency and comprehension in reading.
1.2.11A Read and understand essential content of informational texts and documents in all academic areas.
1.4.11B Write complex informational pieces (e.g., research papers, analyses, evaluations, essays).
1.5.11A Write with a sharp, distinct focus.
1.5.11B Write using well-developed content appropriate for the topic.
1.5.11C Write with controlled and/or subtle organization.
1.5.11D Write with a command of the stylistic aspects of composition.
1.5.11E Revise writing to improve style, word choice, sentence variety and subtlety of meaning after rethinking how questions of purpose, audience and genre have been addressed.
1.5.11F Edit writing using the conventions of language.
1.6.11A Listen to others.
1.6.11C Speak using skills appropriate to formal speech situations.

Reading, Writing, Speaking and Listening

1.6.11 E Participate in small and large group discussions and presentations.
1.6.11F Use media for learning purposes.
1.8.11A Select and refine a topic for research.
1.8.11B Locate information using appropriate sources and strategies.
1.8.11C Organize, summarize and present the main ideas from research.

Career Education and Work

13.1.11 A. Analyze career options based on student interests, abilities, aptitudes and accomplishments.
13.1.11D. Justify the selection of a career.
13.1.11G. Analyze the opportunity cost/benefit of continuous learning.
13.2.11B. Analyze and evaluate complex technical tasks using sophisticated processes.
13.2.11D. Identify sources of health, safety regulatory practices and their effect on the work environment.
13.2.11G G. Analyze the need for manipulative/motor skills.
13.3.11 A. Analyze work habits needed to advance within a career.

Science and Technology

***3.1.10E** Describe patterns of change in nature, physical and man made systems.*
3.2.10AApply knowledge and understanding about the nature of scientific and technological knowledge.
3.2.10B Apply process knowledge and organize scientific and technological phenomena in varied ways.
3.3.10B Describe and explain the chemical and structural basis of living organisms.
3.6.10B Apply knowledge of information technologies of encoding, transmitting, receiving, storing, retrieving and decoding
3.6.10C Apply physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems
3.7.10B Apply appropriate instruments and apparatus to examine a variety of objects and processes.
3.7.10C Apply basic computer operations and concepts.
3.7.10D Utilize computer software to solve specific problems.
3.7.10E Apply basic computer communications systems.
3.8.10A Analyze the relationship between societal demands and scientific and technological enterprises.

Science and Technology

3.8.10B Analyze how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.

3.8.10C Evaluate possibilities consequences and impacts of scientific and technological solutions.

Economics

6.1.12C Assess the strength of the regional,
national and/or international economy
and compare it to another time period based upon economic indicators.
6.2.12F Identify and analyze forces that can change price.
6.4.12A Analyze how specialization may increase the standard of living.
6.5.12 A. Analyze the factors influencing wages.
6.5.12D Analyze the role of profits and losses
in the allocation of resources in a market economy.

Geography

7.1.12 B. Analyze the location of places.
7.3.12D D. Analyze the significance of human
activity in shaping places and regions by their economic characteristics.

Health, Safety and Physical Education

10.1.12 B. Evaluate factors that impact the body systems and apply protective/preventive strategies.
10.1.12 D. Evaluate issues relating to the use/non-use of drugs.
10.1.12 E. Identify and analyze factors that influence the prevention and control of health problems.
10.2.12 A. Evaluate health care products and services that impact adult health practices.
10.2.12B. Assess factors that impact adult health consumer choices.
10.2.12 C. Compare and contrast the positive and negative effects of the media on adult personal health and safety.

History

8.1.12 B. Synthesize and evaluate historical sources.
8.1.12D. Synthesize historical research.

Math

2.2.11E. Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.
2.5.11B Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
2.6.11G Describe questions of experimental design, control groups, treatment groups, cluster sampling and reliability
2.11.11A Describe questions of experimental design, control groups, treatment groups, cluster sampling and reliability.
2.11.11B Interpret maximum and minimum values in problem situations.

Civic and Government

5.3.12H. Evaluate the impact of interest groups on the political process.
5.3.12 J. Evaluate the role of media in political life in the United States and explain the role of the media in setting the public agenda.

Arts and Humanities

9.1.12 C. Integrate and apply advanced vocabulary to the arts forms.
9.1.12D. Demonstrate specific styles in combination through the production or performance of a unique work of art
9.1.12E Delineate a unifying theme through the production of a work of art that reflects skills in media processes and techniques.
9.1.12H. Incorporate the effective and safe use of materials, equipment and tools into the production of works in the arts at work and performance spaces.

Family and Consumer Sciences

11.1.12 D. Evaluate the role of consumer rights and responsibilities in the resolution of a consumer problem through the practical reasoning process.
11.1.12GCompare the availability, costs and benefits of accessing public, nonpublic and for-profit services to assist the family.
11.2.12 C. Analyze teamwork and leadership skills and their application in various family and work situations.

Environment and Ecology

4*.2.10D Explain different management alternatives involved in recycling and solid waste management.*
4.3.10A Describe environmental health issues.
4.9.10A Explain why environmental laws and regulations are developed and enacted.

World Languages

12.3.14D. Use the target language to synthesize topics and events from other subject areas.

B. Objectives:

- *Students will synthesize a PowerPoint presentation on a biology career of choice.*
- *In their presentation, they will compare and contrast the skills needed in the biology career to their actual chosen career path.*
- *Students will analyze the technology used in the chosen field and be able to explain the concepts behind that technology.*
- *There will be research into a disease that requires the specific testing and its possible prevention through healthy lifestyle habits such as diet and exercise.*
- *The economics of providing this testing will be evaluated; its cost to the hospital, family and community and the role of the insurance companies in healthcare.*
- *The students will reflect upon the history behind the invention of the current technology and the resulting career and provide a glossary of terms with their language of origin and root word meanings listed.*
- *The geographic locations that provide the best opportunities for the career will be explored through the use of the Occupational Outlook Handbook, current version, through use of the internet.*

C. Introduction/Motivation

Each year, usually on the first day this topic comes up and this activity will be a way for the students to evaluate their reasons for studying Biology and hopefully be a motivator for their success in the class.

D. Activity/Procedure

1. Using the guiding question technique, assess what the students know about Biology by having the students do a focus-free write in their journals on 'What is Biology?". Results will be shared with the group and important points written on the board. Additional discussion will be on the term biology and its Greek origin. Discuss some of the major fields of biological science (e.g., zoology, botany, microbiology, genetics, and ecology).

2. The students will fill out a KWHL Chart **graphic organizer to assess their knowledge about why and how we study biology. Individually they will fill out the K (**What do we already know?) **and W (**What do we want to find out?) **sections and then form small groups (by learning style?) for H (**How are we going to find out? What primary and secondary resources can we access?) **discussion. A listing will be generated on a transparency for the K, W and H topics as each are discussed. Next, using one of the 5 excerpts from actual college biology programs, the students will fill out the L section of the chart. Results will be shared with the group acknowledging that reasons for studying Biology are personal opinions and therefore should be respected as such.**

3. The students will be led on a web quest to discover the many careers available for biology majors with emphasis being placed on the medical field. The students will complete a questionnaire during the activity to supply them with some base knowledge about types of careers.

4. The students will complete a matching activity that defines job skills. Some of this information will be used in their presentation.

5. The students will choose a medical career to investigate further from the list generated by the Meadville Medical Center. They will use both library print resources and internet sources. Students will use the Report guidelines sheet and the rubric to generate a PowerPoint presentation explaining their career. They will be assessed according to the rubric.

5. Through discussion, additional standards in other content areas will be addressed.

E. Materials

Students will need:
Internet access
Printer
Floppy Disk
KWHL materials
Library access
Production lab access
Report guidelines sheet
Web Quest address
PowerPoint Example to view
State standards that will be addressed
Pamphlets on medical careers

F. Assessment

The KWHL chart will become part of their portfolio.
The web quest will be e-mailed to the instructor by the student when completed for assessment
For the Power Point presentation, the students will be assessed according to the rubric.
The discussion will be followed by a demonstration of concepts using response cards.