Lesson 16-18: “Research, Guest Speaker, Presentations”

I. Time: Three 50 minute class periods

II. Materials:
   a. Handout: “Unit Project Rubric” from the first lesson of the unit
   b. Student access to computers and other research resources
   c. Consider showing students brochure templates in Microsoft® programs so that they are able to focus on brochure content
   d. Document Camera
   e. A guest speaker will be needed to discuss current issues/problems in water treatment, conservation, and pollution. It is recommended that a city water official, local farmer, environmental agent, or other professional in any industry or government service related to water use be contacted to plan for this lesson.

III. Objectives:
   After successful completion of the lesson, students will be able to
   a. Research, present, discuss, and write about an important biological issue on water.
   b. Discuss the importance of water use, conservation, and protection in at the local, state, and federal level.

Maryland State Objectives:
   a. Expectation 1.2: The student will pose scientific questions and suggest investigative approaches to provide answers to questions.
   b. Expectation 1.4: The student will demonstrate that data analysis is a vital aspect of the process of scientific inquiry and communication.
   c. Expectation 1.5: The student will use appropriate methods for communicating in writing and orally the processes and results of scientific investigation.
   d. Expectation 1.7: The student will show that connections exist both within the various fields of science and among science and other disciplines including mathematics, social studies, language arts, fine arts, and technology.
      a. Indicator 1.7.5: The student will investigate career possibilities in the various areas of science. (NTB)
   e. Expectation 3.5: The student will investigate the interdependence of diverse living organisms and their interactions with the components of the biosphere.
      a. Indicator 3.5.2: The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.
   f. Expectation 3.6: The student will investigate a biological issue and develop an action plan.

IV. Lesson 1: Research
   a. Opening:
      i. Tell students that they will be researching their topics and producing a brochure on that issue. You may want to quickly review with students the topics that were discussed in this unit if they need to decide on a topic. You may want to assign topics to different student groups ahead of time.
   b. Development:
      i. Have students do background research for their projects. You may want to do this in the library at your school and you also may want to spend more than one day doing research.
      ii. Have computers and resources ready and available for students.
      iii. Remind to students to follow the guidelines from their project rubrics that they received on the first day of this unit.
   c. Closing:

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i. Have students clean up and log off their computers. If you are having a guest speaker come in on the following lesson, review topics of discussion that students would like to have the speaker address. Have students give you questions and note or on paper. Give these papers back to the students as a grade during the next lesson. Be sure to discuss these questions with the guest speaker prior to the next lesson.

V. Lesson 2: Guest Speaker
   a. Opening:
      i. Remind the students that they will be listening and talking to a guest speaker and that they should behave respectfully. Depending on your class and students, you may want to review what respect looks like with them.
   b. Development:
      i. Introduce the guest speaker and have him give his/her presentation. (You may want to have more than one speaker.)
      ii. Have students be responsible and engaged with the speaker by providing them a graphic organizer with questions that students submitted from the previous day. Have them record their thoughts, reactions, and responses from the speaker.
      iii. Allow students to think of and ask the speaker any additional questions.
         1. Be sure to highlight key issues that have been investigated by the students.
         2. Direct the conversation to things that students can do to protect and conserve water and to better manage the earth’s resources.
         3. End the conversation with possible career choices and paths to take to be involved with water supply, quality, treatment, etc…
   c. Closing:
      i. Ask the students and the speaker if there are any last questions or issues. Thank the guest speaker for his/her time.
      ii. If time permits, grade the student papers and discuss the following lesson. You may want to allow students to have an additional day of research between this lesson and their presentations.

VI. Lesson 3: Student Presentations
   a. Opening:
      i. Remind the students that they will be presenting and listening today and that they should behave respectfully. Ask the students to think about questions for the group presenting for after the presentation.
   b. Development:
      i. You may want to again give students a graphic organizer with group names and questions. It might be a good idea to make this ahead of time with questions submitted from the previous lessons already written down. Leave space for students to add their own questions as opportunity presents itself.
      ii. Have the student present in their groups. They should be limited to 3-5 minutes each and each person should be presenting a specific subtopic of their project.
   c. Closing:
      i. Thank the students for their presentations. Summarize the various issues and key points. Remind students that there will be a formal, summative assessment to follow and that other topics not discussed, but in the unit will be tested on.

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VII.  **Suggested Assessments:**
   a. Use the rubric to grade the presentations.
   b. Students can be graded on how well they listen and participate to presenting groups.
   c. Today’s lesson is a major assessment of the unit. Completion of the unit project will meet today’s objectives.
   d. Today’s lesson marks the end of the unit and the students will be doing a formative assessment on the following lesson.

VIII.  **Related Links/Resources:**
   a. It will be necessary to find a guest speaker in advance. Start with your local city public works department. You may want to have more than one speaker.
   b. Without the use of a document camera, it may be necessary to change the medium of the presentation. For example, students could make a poster instead of a brochure.