Sustainable Agriculture: Soils and Food Production

Unit Outline

1. Project Team Members: Clark, M., Ochs, C.

2. Title of Course: Ag. Environmental Science (9th Grade)

3. Title of Unit or Project: Sustainable Agriculture: Soils and Food Production

4. Approximate length of Unit or Project: 2 – 3 weeks

5. Brief description of the Unit with an expected final outcome:

   This unit will introduce students to concepts that will enable them to understand the sustainability of agriculture through an environmental awareness of soils and food production. Students will conduct an interview with an individual over 60 years of age, write a report and present findings to the class; create a layout of best management practices for a farm and explain to the class; and complete lab exercises.

6. Major Goals of Unit:

   Students will be able to:

   1. Recognize differences in soil quality from one area to another.
   2. Describe the importance of organic matter in soil health.
   3. Suggest ideas that will help provide adequate food supplies for the world.
   4. Interview a person over 60 years of age familiar with agricultural practices of their youth in order to learn about the costs and benefits of changing technology.
   5. Define “true progress” and discuss whether various technological changes qualify as being true progress.

   Students will know:

   1. Basic information about soil ecosystems:
      - component parts of soil
      - soil profile
      - soil texture and its effects
      - soil structure and its effects
      - soil erosion and conservation

   2. The role of agriculture in food production.

3. The role of technology in agriculture:
    - changes in farm machinery
    - the "Green Revolution"
    - pesticides
    - integrated pest management

4. Food as a possible limiting factor for the human population:
    - global differences in food availability
    - approaches to insuring an adequate food supply

7. Sequence of balanced and integrated activities for students:

Students will complete the following activities:

Lab Profile *(Checklist #1)* - Demonstrate the ability to set-up, perform obligated task, collect data, perform calculations, and record results. Participate actively as a group, and exhibit safety at all times in the lab. You are required to read the lab procedures prior to lab exercise.

Audio/Visual Profile *(Checklist #2)* – Develop a note/remark portfolio by recording information of importance during any video within class. Your portfolio will provide you with notes to study for test preparation and will be collected for evaluation.

Unit Profile *(Checklist #2)* – Illustrate your competency of learning by completing an examination of which will include: descriptive paragraphs, group analysis, item comparison, sketching, expanding and defending.

Agriculture Report *(Checklist #3)* – Summarize in a report the information you have attained through your interview/meeting with an individual over 60 years of age concerning their agricultural experiences. Following your interview/meeting you are required to construct a report that you will later present to your peers in class.

Best Management Project *(Checklist #4)* – Utilize and apply BMP information sheets to layout and draw-in your practices for the farm property skeleton provided. You will display and describe to the class your farm practices and explain the rational for the practices. In addition, you are required to facilitate any questions your classmate may have.

8. Checklists of assessment components for students: Four different checklists are attached at the end of this file.

9. Specific Standards addressed in this Unit:

Ref. #	*Name of Standard*	*Title of Individual Standard*
1.1.8 D, F	PA-RWSL	Learning to Read Independently
1.2.8 A	PA-RWSL	Reading Critically in All Content Areas
1.4.8 B	PA-RWSL	Types of Writing
1.5.8	PA-RWSL	Quality of Writing
1.6.8 A, C, D, E	PA-RWSL	Speaking and Listening
1.8.8 C	PA-RWSL	Research
2.1.8 A	PA-M	Numbers, # Systems, # Relationships
2.2.8 A, B, F	PA-M	Computation, Estimation
2.3.8 B, D	PA-M	Measurement and Estimation
2.4.8 B	PA-M	Mathematical Reasoning and Connections
3.1.10 E	PA-ST	Unifying Themes of Science
3.2.10 A	PA-ST	Inquiry and Design
3.5.10 B	PA-ST	Earth Sciences
3.6.10 A	PA-ST	Technology Education
4.4.10 A, B, C, D	PA-EE	Agriculture and Society
4.5.10 A, B, C	PA-EE	Integrated Pest Management
4.8.10 A, B	PA-EE	Humans and the Environment

Student Name: _____ **Checklist #1**

Lab Name:_____Date: _____

LAB PROFILE - CHECKLIST

Items Evaluated	**Possible Points**	**Points Earned**
· Worksheet Completion:	---	-------
- Data	20	_____
- Calculations	20	_____
- Results	20	_____
· Set-up & Preparation	10	_____
· Group Participation	10	_____
· Safety	10	_____
· Clean-up	10	_____
TOTAL	**100**	

Student Name: _____ **Checklist #2**

Date: _____

PARTICIPATION/ASSIGNMENT - CHECKLIST

Items Evaluated	**Possible Points**	**Points Earned**
· Notebook Observations	20	_____
· Homework Collections	40	_____
· Quizzes	40	_____
· Unit Test	50	_____
TOTAL	**150**	

Student Name: _____ **Checklist #3**

Date: _____

AGRICULTURAL REPORT - CHECKLIST

Items Evaluated	**Possible Points**	**Points Earned**
· Directions Followed	20	_____
· Grammar and Spelling	20	_____
· Content of Report	20	_____
· Presentation to Class	20	_____
· Complete on Time	20	_____
TOTAL	**100**	

Student Name: _____ **Checklist #4**

Date: _____

AGRICULTURAL REPORT - CHECKLIST

Items Evaluated	**Possible Points**	**Points Earned**
· Group Focused/Worked Together	10	_____
· BMP Displayed on Diagram Properly	10	_____
· BMP Clearly Presented to Class	10	_____
· Group Handled any Questions/Comments from Class	10	_____
TOTAL	**40**	