



Careers in Environmental Systems

Middle School Food and Agricultural Literacy Curriculum

Precepts

- I. Professional Growth
- II. Make clear decisions in my professional life.

National Standards

- CS.02.03.01.a. Explore various career interests/ options.
- CS.02.03.03.a. Identify the skills required for various careers.
- CS.03.01.01.a. Use basic technical and business writing skills.
- NL-ENG.K-12.4 – Communication Skills
- NL-ENG.K-12.12 – Applying Language Skills

Student Learning Objectives

- As a result of this **unit** the students will...
- Explore the eight pathways of the Agriculture, Food and Natural Resources (AFNR) career clusters.
- As a result of this **lesson** the students will...
- Identify five careers in environmental service systems.

Content Outline

- I. **Identify five careers in the environmental services system**
 - A. Brainstorm words related to environment
 - B. Define **environmental**
 - C. Discover; career/job title; job description (including specific examples); type of training necessary to obtain a career; working conditions; salary range for the following careers in the **environmental** services system
 1. **Environmental** Conservationist
 2. **Environmental** Scientist
 3. **Environmental** Educator
 4. Soil Conservationist
 5. Water Resources Manager

Time

Instruction time for this lesson: 45 minutes.

Resources

Brochure rubric. (2009). Retrieved from <http://mconn.doe.state.la.us/> — Career planning guide. (2009). Retrieved from <http://www.cteresource.org/verso/cpg/> — National FFA Organization. (2009). Career explorer search results. Retrieved from <http://www.ffa.org/index.cfm> — National FFA Organization. (2009). LifeKnowledge Precepts and Signs of Success — Resource guide to careers in toxicology. (2009). Retrieved from <http://www.toxicology.org/AI/apt/careerguide.asp> — States' Career Clusters Initiative. (2009). Agriculture, Food and Natural Resources Model. — Retrieved July 22, 2009, from States' Career Clusters Initiative Web site: <http://www.careerclusters.org/resources/ClusterDocuments/agdocuments/1AGModel.pdf>

Tools, Equipment, and Supplies

Writing surface and markers
Dictionary
MS.CAS.1.4.AS.A through E – copies to hang around room, number will vary depending on size of class, about one set per 10 students
MS.CAS.1.4.RUBRIC.A – one per student
White Paper – one piece per student

Key Terms

The following terms are presented in this lesson and appear in **bold italics**:

Environmental

Interest Approach

Tape a copy each of **MS.CAS.1.4.AS.A** through **E** around the room before class begins. Several copies may be needed if it is a large class.

Good day. Thank you all for coming today and being prepared to learn. When I say GO, please grab a piece of paper and write the word **environmental** in the middle of the paper. Take the next two minutes and write all the words that you think of when you hear the word **environmental** around it. What questions do you have? GO!

If students are struggling give them a number to shoot for and give some examples that you think of when you hear the word. While they are writing, put the word "**environmental**" on the board. Count down the last five seconds to draw back students' attention.



Lesson number: MS.CAS.1.4

Middle School Food and Agricultural Literacy Curriculum

Careers in Environmental Systems

Thank you. Please focus on the board and notice the word **environmental**. As we go around the room, share one word you wrote down as we record them on the board. We will continue around the room until everyone's list is exhausted. If your list is empty just say pass. What questions are there? Who will start?

Facilitate the activity.

Great job. As we can see one word can bring about many ideas. Let's come up with a class definition for the word.

Hand a dictionary to someone in the class and ask them to look up environment and read the definitions to the class.

Here is a dictionary. Please look up the word **environmental** and share the definitions with the rest of the class. I will record the definition on the board as it is read.

Today we are going to teach each other about the different career options in the area of **environmental** systems. This is a great opportunity for us to discover amazing opportunities for each of our futures.

Summary of Content and Teaching Strategies

Objective 1. Identify five careers in **environmental** service systems.

Let's continue to talk about the word of the day.

Use the Choral Response e-Moment® to cement the word **environmental** in the students' minds.

The word of the day is what? **Environmental**. Great! There are several posters around the room. We will have the opportunity to take a look at each of them. When I say GO, grab a writing utensil and a piece of paper, stand up and quietly move to the poster closest to you. We will spend three minutes at each poster. Record the following information on your paper.

Write the following information on a writing surface in front of class and point to the headings as you explain:

- Career/job title
- Job description (including specific examples)
- Type of training necessary to obtain a career
- Working conditions
- Salary range

We are going to use the information we gather to create a flier that will be collected and distributed to each of you to keep in your notebooks. What questions are there? GO!

Let students know when three minutes are up at each poster so they may rotate to the next one. Feel free to allow more or less time at each poster based on student progress.

Distribute **MS.CAS.1.4.RUBRIC.A** to each student and read through the flier requirements together.

What a smart class! Thanks again for staying focused on the task at hand. When I say, MAKE IT, we have 20 minutes to create a flier. The flier must include at least two of the career areas you read about on the posters. Please include the specific information we wrote down as you walked around the room but don't feel limited by that. Feel free to add personal thoughts or insights you have on your flier. Please include how much you would like this job on a scale of 1-10 and at least two graphics per career. The graphics can be hand-drawn or computer generated. What questions do you have? MAKE IT!

Review/Summary

Nice job on the fliers today. It is imperative that we are able to make clear decisions in our professional life. Whether or not we choose **environmental** systems as a career, we have given ourselves a leg-up on other job seekers by educating ourselves on what is necessary for career success in this area.

To finish today, let's sit in a big circle on the floor. Before you move, be sure to have your flier with you.

Allow students to be seated in the circle.

We will pass our fliers three people to the right. Read through the flier you end up with and be ready to explain it to someone else.



Lesson number: MS.CAS.1.4

Middle School Food and Agricultural Literacy Curriculum
Careers in Environmental Systems

Students should scan the flier. When done, ask students to explain their flier to a partner that they're sitting beside. Since all students read about the careers, have them ask questions or identify information that didn't make it on the flier, but could add to it. Facilitate the activity by passing them further down, etc. as time allows.

Thanks for sharing the information we found today! Keep these careers in mind as we plan for the future.

Application

Extended classroom activity:

Create a PowerPoint on another **environmental** systems-related company. Interview someone in this field and report back to the class on what they specifically do.

FFA activity:

Participate in the Forestry CDE or plan a conservation project.

SAE activity:

Search for an SAE in this system or shadow a professional as an exploratory SAE.

Evaluation

Use Rubric, MS.CAS.1.4.RUBRIC.A, to evaluate flyer.

Answers to Evaluation

Answers will vary.



Flyer Rubric

Directions: Utilize this activity sheet while we are constructing our flyers. Concentrate on the excellent category and make sure each of us will receive full points.

CATEGORY	(4) Excellent	(3) Good	(2) Almost	(1) Not Yet
Attractiveness & Organization	The flyer has attractive formatting, is in point form and has very well organized information.	The flyer has attractive formatting, is in point form and has organized information.	The flyer has adequate formatting, is in point form and is somewhat organized.	The flyer's formatting and organization of material are confusing to the reader. Information is not in point form.
Content/ Accuracy	The flyer has at least 6 items for 2 careers	The flyer has 4 or 5 items for 2 careers	The flyer has 2 or 3 items for 2 careers	The flyer has 1 or no items for 2 careers
Writing – Mechanics: Spelling Sentence Form Grammar	All of the writing is in complete sentences. Capitalization, punctuation and spelling are correct throughout the flyer.	Most of the writing is in complete sentences. Most of the capitalization, punctuation and spelling are correct throughout the flyer.	Half of the writing is in complete sentences. Some of the capitalization, punctuation and spelling are correct throughout the flyer.	Much of the writing is not in complete sentences. Much of the capitalization, punctuation and spelling are not correct throughout the flyer.
Graphics/ Pictures	Has at least one hieroglyphic per item of interest that goes with the text. Graphics are in color and neat.	Missing one or two hieroglyphics per item of interest but the ones there go with the text. Graphics are in color and neat.	Missing one or two hieroglyphics per item of interest but the ones there go with the text. Graphics may or may not be colored or neat.	Missing three or four hieroglyphics per item of interest. Graphics may or may not be colored or neat.



Environmental Conservationist

\$53,500 Annual Average (U.S. Bureau of Labor and Statistics)

Career Cluster: Environmental Service Systems

General Information: Environmental conservationists are concerned with conservation as it applies strictly to the environment and environmental repercussions.

Career Information: Environmental Conservationists, who work primarily for state and local governments, ensure that water and air meet government standards and help ensure that pollution is reduced. They check the outputs of dairies and processing plants. In addition, Environmental Conservationists may visit pollution sources and test for pollutants by collecting air, water, or waste samples for analysis. They try to determine the nature and cause of pollution and initiate action to stop it. Environmental Conservationists and compliance officers enforce a wide range of laws, regulations, policies, or procedures. They inspect and enforce rules on matters such as environmental health, safety, and licensing. Environmental Conservationists duties vary widely and have numerous specialties. Environmental Conservationists, who work primarily for State and local governments, ensure that water and air meet government standards. In addition, Environmental Conservationist may visit pollution sources and test for pollutants by collecting air, water, or waste samples for analysis. They try to determine the nature and cause of pollution and initiate action to stop it. In large local and State health or agriculture departments, Environmental Conservationists may specialize in the areas of milk and dairy products, food sanitation, waste control, air pollution, water pollution, institutional sanitation, or occupational health. In rural areas and small towns, they may be responsible for a wide range of environmental health activities. Environmental Conservationists help in recycling efforts and solid waste management.

Educational Requirements: Vocational/Certificate

Suggested High School/Collegiate Courses: Agriculture, physical and biological sciences, family and consumer sciences, business, math and computers. State licenses.

Skills Necessary: Mathematical, Analytical, Oral Communications, Scientific, Work independently, Decision Making, Computer Skills, Written Communications, Detail Oriented, Research, Technical, Negotiating, Investigative, Good Judgment, Determination

Job Availability: Good Growth

Location of jobs: Federal, state local government, universities, research facilities or extension offices

Working Conditions: Many conservation scientists often work outdoors in all kinds of weather, sometimes in isolated areas.



Environmental Scientist

\$55,190 Annual Average (U.S. Bureau of Labor and Statistics)

Career Cluster: Science, Technology, Engineering & Mathematics

General Information: Environmental scientists develop research and studies related to the protection of the environment.

Career Information: Environmental Scientists design and direct special studies to obtain technical environmental information about planned projects by contacting and using different sources. Environmental Scientists research, identify and analyze different sources of pollution to determine their effects on the environment and find alternative ways to handle projects in an environmentally sensitive manner. They do this by collecting and synthesizing data derived from pollution emission measurements, atmospheric monitors, meteorological and mineralogical information and soil or water samples. By using their knowledge of the principles and concepts of different scientific and engineering disciplines, environmental scientists conduct research studies to develop theories or methods for abating or controlling pollution and solid waste sources. They gather and interpret information to find logical solutions to environmental problems and make decisions based on information that can be measured/verified.

Educational Requirements: 4 year degree

Suggested High School/Collegiate Courses: Agriculture, government, political sciences, science, business, recreation and urban planning, environmental studies. Degree in Science

Skills Necessary: Mathematical, Analytical, Oral Communications, Organizational, Scientific, Dependable, Work independently, Computer Skills, Written Communications, Self-Motivated, Detail Oriented, Works under pressure, Investigative, Good Judgment, Inquisitive, Determination, Persistent

Job Availability: Excellent Growth

Location of jobs: Federal, state local government, universities, research facilities or extension offices

Working Conditions: Work can be done in laboratories and outside in fields as well



Environmental Educator

Salary Unknown, depends if in public schools or private organizations

Career Cluster: Education & Training

General Information: Environmental Educators teach students and/or companies about problems and factors affecting the environment and steps that can be taken to protect and conserve the environment. They often work in informal (not public school) education settings.

Career Information: Environmental Educators create, coordinate and teach education programs for urban, rural and suburban environmental centers. They implement on-site and outreach school programs for all age levels, and may teach an after-school environmental club for local children. Responsibilities include teaching students in the field and classroom, program planning and coordination, program evaluation, producing materials for teachers and students, and new program development. Additional responsibilities include preparation of a monthly educator's progress report for board of directors, scheduling programs with teachers and other community leaders, coordinating outreach to other educational institutions and routine correspondence. These educators may teach school groups about coastal ecology, outdoor skills, low ropes/initiatives, and many other activities, some through camp field trips. For example, they may use local streams and watersheds as real-world, hands-on applications for teaching science. Staff will help in the preparation and maintenance of teaching materials, along with creative curriculum development.

Educational Requirements: 4 year degree within discipline

Suggested High School/Collegiate Courses: Agriculture, physical and biological sciences, English, business, math and computers. Degree in Education and Environmental Sciences

Skills Necessary: Oral Communications , Interpersonal, Highly Motivated, Scientific, Team Player, Work independently, Enthusiastic, Computer Skills, Written Communications, Self-Motivated, Presentational, Responsible, Goal Oriented, Investigative, Orderly Minded, Initiative, Good Judgment, Inquisitive, Outgoing Personality, Motivational

Job Availability: Limited

Location of jobs: All United States

Working Conditions: A professional office or classroom environment, working with teachers and students as well as business and industry.



Soil Conservationist

\$53,500 Annual Average (U.S. Bureau of Labor and Statistics)

Career Cluster: Agriculture, Food & Natural Resources

General Information: Plans and develops coordinated practices for soil erosion control, moisture conservation, and sound land use.

Career Information: A Soil Conservationist conducts surveys and investigations on rural or urban planning, agriculture, construction, forestry, or mining on measures needed to maintain or restore proper soil management. They plan soil management practices, such as crop rotation, reforestation, permanent vegetation, contour plowing, or terracing as related to soil and water conservation. They prepare soil conservation plans in cooperation with state, county, or local government, farmers, foresters, miners, or urban planners to provide for use and treatment of land according to needs and capability. Applies principles of two or more specialized fields of science, such as agronomy, soil science, forestry, or agriculture to achieve objectives of conservation. Soil Conservationists may develop or participate in environmental studies.

Educational Requirements: 4 year degree within discipline

Suggested High School/Collegiate Courses: Agriculture, biology, earth science, agronomy, environmental studies, forestry, wildlife, range management.

Skills Necessary: Mathematical, Analytical, Oral Communications, Highly Motivated, Organizational, Motivational, Scientific, Dependable, Team Player, Work independently, Decision Making, Computer Skills, Written Communications, Self-Motivated, Management, Physically Fit, Detail Oriented, Research, Technical, Goal Oriented, Logical, Investigative, Orderly Minded, Initiative, Good Judgment, Inquisitive

Job Availability: Good Growth

Location of jobs: Soil Conservationists usually begin working within one county or conservation district and with experience may advance to the area, State, regional, or national level. Also, soil conservationists can transfer to related occupations such as a farm or ranch management adviser or land appraiser. There are nationwide opportunities.

Working Conditions: Working conditions vary considerably. Deal regularly with landowners, loggers, forestry technicians and aides, farmers, ranchers, government officials, special interest groups, and the public in general. Some work regular hours in offices or labs but may travel to visit with different groups of people.



Water Resources Manager

\$64,100 Annual Average (U.S. Bureau of Labor and Statistics)

Career Cluster: Natural Resource Systems

General Information: Water Resources Managers control and develop programs related to the conservation and proper use of water.

Career Information: Water Resources Managers make sure that there are supplies of clean water available for humans, wildlife and fish. For humans water well drillers set up and run portable drilling rigs and related equipment to drill and service wells. To find a good source of groundwater and to decide where and how to get it to the surface require judgment, skill, training, and experience. Water well drillers supply water to homes, towns, cities, industries, and farms for irrigation. They also work to protect groundwater resources. Water well drillers set up and operate equipment to drill wells. The drilling may also require well driller helpers, pump service rig operators, and pump service rig helpers. Drillers may estimate the water needs of homes or communities in order to decide where and how deep to drill. They bore test holes to get permeation samples. They use them to figure moisture content, permeability, the likelihood of underground water, and the amount of water a well will yield.

Educational Requirements: 4 year degree

Suggested High School/Collegiate Courses: Agriculture, horticulture, botany, plant sciences, geography, conservation, environmental, biology, earth science, math, computers and business.

Skills Necessary: Mathematical, Analytical, Oral Communications, Interpersonal, Organizational, Scientific, Adapts to Change, Team Player, Decision Making, Computer Skills, Written Communications, Self-Motivated, Leadership, Management, Detail Oriented, Tactful, Presentational, Research, Technical, Responsible, Goal Oriented, Customer Service, Logical, Negotiating, Investigative, Orderly Minded, Initiative, Good Judgment, Inquisitive, Determination, Confidence

Job Availability: Excellent Growth Demand by Region

Location of jobs: Federal, state local government, universities, research facilities or extension offices

Working Conditions: Generally in offices. Some outside work may be required for field studies.