

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

**PROGRAM COMPETENCY PROFILE FOR CAREER TECHNICAL EDUCATION**  
**Career Cluster: Science, Technology, Engineering & Mathematics**

**Program Name: Environmental Studies**

**CIP: 030103**

Effective 9/2016

National Organization: National Fish Wildlife; National Forestry; North Am. Association for Environmental Education (NAAEE)

<b>Competencies</b> (statement that provides the overview and defines the instructional area) <a href="http://education.nh.gov/instruction/curriculum/">http://education.nh.gov/instruction/curriculum/</a> <a href="http://www.education.nh.gov/career/career/aaoi.htm">http://www.education.nh.gov/career/career/aaoi.htm</a>  Student will:	<b>Performance Indicators</b> (what a student needs to know and be able to do and upon which they will be assessed )  Student will:	<b>Rating Scale –Performance-Based Assessments</b> ( product or performance project tasks required for the student to demonstrate proficiency in meeting the competency)  Student will:																
<b>SYSTEMS: Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.</b> ELA: 2,4,5,6,7,8,9 AAI: 1,2,4, 9 CRP: 3,4,10,12	1. Describe the nature and scope of the different types of environmental organizations (profit, nonprofit, government, etc.).  2. Describe quality control systems and practices to ensure quality products and services.  3. Identify the career paths and the general requirements of the different fields within this industry.  4. Work productively in teams while using cultural/global awareness.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: Given a scenario such as “your company has been hired to perform an ecological assessment of a given area”, describe the relevant agencies, protocols, safety procedures, quality control and emergency response that would be appropriate for the assignment to be effectively completed. Include #1-14  <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:  <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:  <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	2	3	4															
1	2	3	4															
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<b>SAFETY, HEALTH AND ENVIRONMENTAL: Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.</b> ELA: 2,4,6,7,8,9 AAI: 4,8 CRP:1,9	5. Follow organizational policies and procedures, and contribute to continuous improvement in performance and compliance.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4												
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	6. Practice and demonstrate jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	7. Complete work tasks in accordance with obligations to maintain workplace safety and health.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	8. Employ emergency procedures as necessary to provide aid in workplace accidents (First Aid, CPR,) and be aware of WFA.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	9. Describe the techniques required to respond and assess an emergency situation emergency and/or disaster situation.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	10. Identify and assess the types and sources of workplace hazards to have knowledge of key health and safety concerns.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	11. Correctly interpret and demonstrate knowledge of Workplace Hazardous Materials Information System (WHMIS) symbols by: <ul style="list-style-type: none"> <li>● Using appropriate techniques for handling and storing laboratory equipment and materials</li> <li>● Disposing of laboratory materials; and</li> <li>● Using appropriate personal protection.</li> </ul>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	12. Wear protective equipment and handle natural resource tools and equipment with skill to demonstrate safe use of tools and equipment.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	13. Describe risks related to hazardous materials.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
<b>Understand and apply the concepts of human population and how it relates to the environment.</b> LEA: 2,3,5,6,7,8,9 M: 6 AAI: 5 CRP: 4,7,8	14. Demonstrate appropriate responses for major types of hazardous materials disasters (e.g., chemical, fire and explosion, general safety hazards) (FRA, FRO, HMT, HMS).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
	1	2	3	4		
	15. Describe factors affecting growth rates of a human population.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: You have been hired as an environmental consultant for a humanitarian organization. The organization wants to predict which countries may be in most need of aid over the next 50 years. You must collect and evaluate the relevant datasets in order to predict which countries may be in the greatest need for aid in the future. You must support your conclusions with data and reasoning. Include #15-18, 26, 27, 41-43	1	2	3	4
	1	2	3	4		
16. Identify trends and make predictions based on age structure charts.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4	
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17. Use the Demographic Transition model to explain population trends.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4	
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	18. Explain the relationship between the human population size, its developmental stage and environmental impacts.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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<b>Understand energy efficiency and explain its role in reducing air, water, and soil pollution.</b> ELA: 2,5,6,7,8,9 M: 2, 6 AAI: 5 CRP: 2,4,8	19. Explain how energy is saved and pollution is reduced through the recycling of materials.  20. Explain the benefits and costs of alternative energy sources that produce electricity (e.g. geUtilize a variety of tools to measure energy use and assess energy use impact (e.g. Kill-A-Watt meter, light meter, online calculators, etc.) geothermal, nuclear, photovoltaic, wind, and biomass.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: The city of Rochester is considering the permit requests for several energy companies that would like to build a new facility within the city limits. You have been hired to assess and evaluate the viability and potential environmental impacts of each company's plan as well as determining their ability to meet the current and future energy needs of the citizens of Rochester. Include #19, 20, 25-29, 34-37, 49,50	1	2	3	4				
1	2	3	4							
<b>Understand the concepts fundamental to Environmental Systems and society.</b> ELA: 2,5,6,7,8,9 M: 2 AAI: 6,7 8 CRP: 1,2,4,5,7,8	21. Define the major goals of Environmental Science.  22. Differentiate between renewable and non-renewable resources.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: Design, construct and maintain an aquaponics system that can be used as a viable source of income and food for the school. Include #22, 24, 30-33  <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4	1	2	3	4
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	23. Explain the importance and role of biodiversity.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: Your class has been hired by the community to assess the biodiversity of the Hanson Pines that area adjacent to your school. You must include a section discussing if and how Climate Change may influence the biodiversity of the area. Include #23, 26,27, 28,29, 41-43	1	2	3	4
1	2	3	4			
	24. Define and apply the concept of sustainability as it relates to the economy, environment and society (e.g. sustainable agriculture, aquaculture, environmental justice, and environmental ethics).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	25. Explain the relationship between public health policy/politics and the environment.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	26. Define the greenhouse effect and evaluate the potential long-term impacts on global climate change and resulting environmental impact.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	27. Identify major sources of CO2 emissions.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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<b>TECHNICAL SKILLS: Understand and use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.</b> ELA: 2,4,6,7,8,9 M: 2,16,17,19 AAI: 5 CRP: 2,4,11	28. Create maps of land, facilities, and infrastructure using technology and geospatial techniques (GIS/GPS).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	29. Demonstrate knowledge of surveying, drafting, remote sensing, and GIS equipment used in planning of tasks in environmental services.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	30. Select appropriate instruments (e.g., probes, moisture meters, rain gauges), and materials (e.g., water-sampling kits, soil-testing kits) for the assigned task.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	31. Collect data using a variety of instrumentation.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	32. Calibrate and service instruments according to manufacturer's specifications.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	33. Collect, organize, analyze, interpret and communicate the results of an experiment and make conclusions by applying basic statistics, charts, graphs, and written, verbal and visual tools.	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	34. Identify, analyze, and present solutions for different environmental issues.	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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<b>Understand the issues affecting this industry, including biotechnology, employment, safety, environmental, and animal welfare.</b> ELA: 2,3,6,7,8,9 AAI: 3,6,7 CRP: 2,4,5,7,8,11	35. Learn economic principles in order to apply them to natural resource systems (i.e., supply, demand, and profit).	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	36. Evaluate the impact of and plan for environmental services using analytic procedures and instruments to apply scientific principles to environmental systems management activities.	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	37. Examine and interpret public policies and regulations impacting environmental services.	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	38. Recognize weather systems and weather patterns and describe their relationship to changes in the environment and natural resources.	<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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<b>Understand the concepts fundamental to ecology, ecological cycles and the hydrosphere and apply them to environmental issues, problems and applications.</b> ELA: 2,4,5,6,7,8, 9 M: 2,6 AAI: 5 CRP: 2,4,6,7,8	39. Describe soil compositions and properties to demonstrate knowledge of soil science.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: The city has hired your consulting firm to determine the impact of an invasive plant on the natural resources of the town and to suggest a range control options that the town could use to address the issue. Include #39-45	1	2	3	4
1	2	3	4			
	40. Describe and diagram trophic pyramids as well as ecological cycles (carbon, nitrogen, water, etc.).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	41. Predict and explain how a disruption or change in these cycles would affect an ecosystem.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	42. Explain concepts and practices related to invasive species management.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	43. Demonstrate the ability to use a key or reference guide to identify a variety of common flora and fauna of the New England region.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	44. Identify common wetland types and elaborate on wetland functions (e.g. vernal pools, swamps, and bogs).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			

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All Aspect Industry (AAI) Career Ready Practices (CRP)

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

**PROGRAM COMPETENCY PROFILE FOR CAREER TECHNICAL EDUCATION**  
**Career Cluster: Science, Technology, Engineering & Mathematics**

**Program Name: Environmental Studies**

**CIP: 030103**

Effective 9/2016

National Organization: National Fish Wildlife; National Forestry; North Am. Association for Environmental Education (NAAEE)

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	45. Define a watershed and describe the effects of landuse on its function.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: Your class has been given the task of assessing the health of a local river and connecting it to land use within the watershed. You must design a sampling project that will allow you to use both bioitic and abiotic factors to make your assessment. Include #30-33, 45-48, 50	1	2	3	4
1	2	3	4			
	46. Explain concepts fundamental to Aquatic Ecosystems (aquifers, point/non-point source pollution, ground/surface water, etc.).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	47. Collect aquatic organisms for study using appropriate equipment (e.g. Plankton Tows, D-Nets, Kick Seine).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	48. Describe global water use and distribution and strategies for water conservation.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	49. Use pollution control measures to maintain a safe facility environment.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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<b>Understand the operational service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management, and energy) to manage a facility environment.</b>  ELA: 2,4,5,6,7,8, 9 AAI: 7,8 CRP: 4,7,8,11	50. Identify types of pollution (e.g., ground, surface water, air, noise, radioactive contamination).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example: A major manufacturing facility is being proposed in your local community. As a member of both the planning board and conservation committee, you have been asked to determine the pollution risks that the new facility may pose. In addition to emitting pollutes and contribution to the solid waste stream, the new facility will also, require significant amounts of water build its widget. You must determine if the existing waste management and water treatment systems will be sufficient to handle to the additional strain. Include #35-37, 50-57	1	2	3	4
1	2	3	4			
	51. Discuss and explain the safe disposal of all categories of waste by applying principles of solid waste management (landfill operations).	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	52. Discuss and explain the drinking water treatment operation procedures and principles to assure safe water for a community.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	53. Identify characteristics of drinking water treatment.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	54. Discuss and explain the wastewater treatment and disposal operations using principles for managing wastewater and complying with rules and regulations.	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td> </tr> </table> For Example:	1	2	3	4
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	55. Identify characteristics of wastewater treatment.	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	56. Create maps of land, facilities, and infrastructure using technological tools.	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table> For Example:	1	2	3	4
1	2	3	4			
	57. Demonstrate knowledge of surveying, drafting, remote sensing, and GIS equipment used in planning of tasks in environmental services.	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table> For Example:	1	2	3	4
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