

# SOILS AND LAND MANAGEMENT CURRICULUM

## Course 18091

Soils and Land Management is a course designed to teach students the importance of soil. They will look at the formation of soil, the biology of soil, and proper farming techniques. This course is designed to give the students the proper information they need to move out into the community and use the proper techniques to maintain the soil for future generations.

### SOILS AND LAND MANAGEMENT OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
<ul style="list-style-type: none"><li>• Understand the five soil forming factors and be able to describe each of them.</li><li>• Describe the jobs of the different organisms that live in the soil.</li><li>• Describe how nutrients cycle within the soil.</li><li>• Explain how the chemistry of the soil determines what life you find there.</li><li>• Explain the various terms that are central to understanding soil and land management.</li></ul>	<ul style="list-style-type: none"><li>• Read a topographic map and pick out certain features.</li></ul>	End of Chapter Tests	1/2-year	

**SOILS AND LAND MANAGEMENT MAP:**

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
Unit 1: Basic Soil Knowledge (Weeks 1-6)	<ul style="list-style-type: none"> <li>• Soil formation is a slow process that includes many different factors.</li> <li>• Soils are composed of three basic particles in many different ratios.</li> <li>• Soil depends on the diverse number of organisms that live there to make it healthy</li> </ul>	<ol style="list-style-type: none"> <li>1. Understanding the five soil forming factors.</li> <li>2. Understanding the three basic soil particle sizes and how they mix to make different soils.</li> <li>3. Understanding that all organisms that live in the soil have a specific job.</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the five soil forming factors.</li> <li>• Explain the difference in the three soil particles sizes.</li> <li>• Explain how the different soil particles mix, using the soil texture triangle.</li> <li>• Explain the role of the different organisms in the soil.</li> </ul>	<p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.10.C Evaluate the efficiency of energy flow within a food web.</p> <p>Describe how energy is converted from one form to another as it moves through a food web (photosynthetic, geothermal).</p> <p>4.1.10.D Research practices that impact biodiversity in specific ecosystems.</p> <p>Analyze the relationship between habitat changes to plant and animal population fluctuations.</p> <p>4.1.10.E Analyze how humans influence the pattern of natural changes (e.g. primary / secondary succession and desertification) in ecosystems over time.</p> <p>4.1.12.C Research how humans affect energy flow within an ecosystem.</p> <p>Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem</p> <p>4.3.10.A Evaluate factors affecting the use of natural resources.</p> <p>Evaluate the effect of consumer demands on the use of natural resources.</p> <p>Analyze how technologies such as modern mining, harvesting, and</p>	<ul style="list-style-type: none"> <li>• Understand the five soil forming factors and be able to describe each of them.</li> <li>• Understand the difference in the sizes of the three soil particles and use the soil texture triangle to determine the soil type.</li> <li>• Describe and label the soil horizons on a soil profile.</li> <li>• Describe the jobs of the different organisms that live in the soil.</li> <li>• Describe how nutrients cycle within the soil.</li> <li>• Explain how the chemistry of the soil determines what life you find there.</li> </ul>	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Daily assignments</p> <p>End of Chapter Tests</p> <p>Labs and Classroom activities</p>

			<p>transportation equipment affect the use of our natural resources.</p> <p>Describe how local and state agencies manage natural resources.</p> <p>4.3.10.B Analyze how humans manage and distribute natural resources.</p> <p>Describe the use of a natural resource with an emphasis on the environmental consequences of extracting, processing, transporting, using, and disposing of it.</p> <p>Analyze the impact of technology on the management, distribution, and disposal of natural resources.</p> <p>4.3.10.C Compare and contrast scientific theories.</p> <p>Know that both direct and indirect observations are used by scientists to study the natural world and universe.</p> <p>Identify questions and concepts that guide scientific investigations.</p> <p>Formulate and revise explanations and models using logic and evidence.</p> <p>Recognize and analyze alternative explanations and models.</p> <p>4.3.12.B Analyze factors that influence the local, regional, national, and global availability of natural resources.</p> <p>Compare the use of natural resources in different countries.</p> <p>Analyze the social, economic, and political factors that affect the distribution of natural resources</p>			
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				<p>(e.g., wars, political systems, classism, racism).</p> <p>4.3.12.C Examine the status of existing theories.</p> <p>Evaluate experimental information for relevance and adherence to science processes.</p> <p>Judge that conclusions are consistent and logical with experimental conditions.</p> <p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.</p> <p>Communicate and defend a scientific argument.</p> <p>4.4.10.C Analyze how agricultural sciences and technologies strive to increase efficiency while balancing the needs of society with the conservation of our natural resources.</p> <p>4.5.10.E Describe the impact of occupational exposure to pollutants.</p> <p>Analyze laws and regulations designed to protect human health.</p> <p>Analyze efforts to prevent, control, and/or reduce pollution through cost and benefit analysis and risk management.</p>			
<p>Unit 2: Understanding Maps, Surveys, and Land Formations (Weeks 7-9)</p>	<ul style="list-style-type: none"> <li>The topography of an area can determine the types of soils that you will find there.</li> </ul>	<ol style="list-style-type: none"> <li>Different soils form at different elevations and are moved by gravity</li> </ol>	<ul style="list-style-type: none"> <li>Explain the rules for a contour line.</li> <li>Describe how to determine the elevation of</li> </ul>	<p>4.1.10.F Compare and contrast scientific theories.</p> <p>Know that both direct and indirect observations are used by scientists to study the natural world and universe.</p>	<ul style="list-style-type: none"> <li>Understand how to read a topographic map and pick out certain features.</li> <li>Describe the rules of contour</li> </ul>	<p>Students will be given the following: Preferential seating when applicable Study guides</p>	<p>Daily assignments End of Chapter Tests</p>

	<ul style="list-style-type: none"> <li>Understanding the different geological landforms can tell you how the soil was formed and how long the soil has been there.</li> <li>A soil survey is an important tool in understanding how we should use the soil in a specific area.</li> </ul>	<ol style="list-style-type: none"> <li>from one elevation to another.</li> <li>Geological landforms can help us understand how the soil in that area was formed.</li> <li>Soil surveys are very important to determining how to use soil in a certain area.</li> </ol>	<p>a contour line on a map.</p> <ul style="list-style-type: none"> <li>Explain what certain symbols mean on a map.</li> <li>Explain the difference between alluvial, colluvial, residual, and loess soils.</li> <li>Describe the different soil textures: blocky, prismatic, columnar, platy, and granular.</li> </ul>	<p>Identify questions and concepts that guide scientific investigations.</p> <p>Formulate and revise explanations and models using logic and evidence.</p> <p>Recognize and analyze alternative explanations and models.</p> <p>4.1.12.D Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <p>Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.1.12.F Examine the status of existing theories.</p> <p>Evaluate experimental information for relevance and adherence to science processes.</p> <p>Judge that conclusions are consistent and logical with experimental conditions.</p> <p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.</p> <p>Communicate and defend a scientific argument.</p>	<p>lines and explain how to determine the elevation of a contour line.</p> <ul style="list-style-type: none"> <li>Understand how to read a map legend and explain certain symbols on a map.</li> <li>Explain certain geological terms.</li> <li>Alluvial Soil</li> <li>Colluvial Soil</li> <li>Residual Soil</li> <li>Loess</li> <li>Granular Texture</li> <li>Platy Texture</li> <li>Prismatic Texture</li> <li>Columnar Texture</li> <li>Blocky Texture (Angular and Sub angular).</li> </ul>	<p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Labs and Classroom activities</p>
<p>Unit 3: Soil History and Conservation (Weeks 10-13)</p>	<ul style="list-style-type: none"> <li>The Dust Bowl was an important time in the conservation of our soils.</li> <li>As the human population grows pollution</li> </ul>	<ol style="list-style-type: none"> <li></li> </ol>	<ul style="list-style-type: none"> <li></li> </ul>	<p>4.2.10.A Examine the interactions between abiotic and biotic factors within a watershed.</p> <p>Describe how topography influences the flow of water in a watershed.</p> <p>Describe how vegetation affects water runoff.</p>	<ul style="list-style-type: none"> <li></li> </ul>	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p>	<p>Daily assignments</p> <p>End of Chapter Tests</p> <p>Labs and Classroom activities</p>

	<p>becomes a greater threat to our soils.</p> <ul style="list-style-type: none"> <li>• Our soils have to supply us with the food that we need to feed more than 7 billion people.</li> <li>• Agricultural practices have changed throughout history to try to conserve soil and make it healthier.</li> </ul>			<p>Investigate and analyze the effects of land use on the quality of water in a watershed.</p> <p>4.2.12.A Examine environmental laws related to land use management and its impact on the water quality and flow within a watershed.</p> <p>4.3.10.A Evaluate factors affecting the use of natural resources.</p> <p>Evaluate the effect of consumer demands on the use of natural resources.</p> <p>Analyze how technologies such as modern mining, harvesting, and transportation equipment affect the use of our natural resources.</p> <p>Describe how local and state agencies manage natural resources.</p> <p>4.3.12.B Analyze factors that influence the local, regional, national, and global availability of natural resources.</p> <p>Compare the use of natural resources in different countries.</p> <p>Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism).</p> <p>4.4.10.A Explain the relationships between and among the components of the food and fiber system. (i.e., production, processing, research and development, marketing, distribution, and regulations.)</p> <p>4.4.10.B</p>		<p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	
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			<p>Analyze the effects of agriculture on a society's economy, environment, standard of living, and foreign trade.</p> <p>4.4.10.C Analyze how agricultural sciences and technologies strive to increase efficiency while balancing the needs of society with the conservation of our natural resources.</p> <p>4.4.10.D Evaluate the use of technologies to increase plant and animal productivity.</p> <p>4.4.10.E Compare and contrast scientific theories.</p> <p>Know that both direct and indirect observations are used by scientists to study the natural world and universe.</p> <p>Identify questions and concepts that guide scientific investigations.</p> <p>Emulate and revise explanations and models using logic and evidence.</p> <p>Recognize and analyze alternative explanations and models.</p> <p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.10.C Analyze real-world data and explain how point and non-point</p>			
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				<p>source pollution can be detected and eliminated.</p> <p>Compare and contrast the environmental effects of different industrial strategies.</p> <p>4.5.12.C Analyze the costs and benefits of means to control pollution.</p> <p>Analyze the role of technology in the reduction of pollution.</p> <p>Research and analyze the local, state, and national laws that deal with point and non-point source pollution.</p> <p>Explain mitigation and its role in maintaining environmental health.</p>			
<p>Unit 4: Engineering Properties of Soil (Weeks 14+15)</p>	•	1.	•		•	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p> <p>Extended time for assignments when needed</p> <p>Separate testing environment when applicable</p>	<p>Daily assignments</p> <p>End of Chapter Tests</p> <p>Labs and Classroom activities</p>
<p>Unit 5: Plant Structure and Function (Week 5)</p>	•	1.	•		•	<p>Students will be given the following: Preferential seating when applicable</p> <p>Study guides</p> <p>Guided notes when applicable</p>	<p>Daily assignments</p> <p>End of Chapter Tests</p> <p>Labs and Classroom activities</p>



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						Separate testing environment when applicable	