

Colorado Environmental Science Course Scope and Sequence

Course Name	System Interactions		Course Details	This is a level 2 course options to begin the Environmental Science pathway.	
			Course = 0.50 Carnegie Unit Credit		
Course Description	Students will explore hands-on projects and activities while studying topics such as land use, water quality, stewardship, and environmental agencies. Study of the natural world including biomes, land, air, water, energy, use and care as well as a focus on issues surrounding man's interaction with the Earth will be addressed in this course.				
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.				
SCED Identification #		Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.			
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at https://www.cde.state.co.us/standardsandinstruction/essentialskills					
Unit Number, Title and Brief Description	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration	
1. Conservation, Preservation, & Exploitation	NRS.1.0 Plan and conduct natural resource management activities that apply logical, reasoned, and scientifically based solutions to natural resource issues and goals. HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems at different scales.	NRS.1.02 Classify different types of natural resources in order to enable protection, conservation, enhancement, and management in particular geographical regions. RST.11-12.1 RST.11-12.7 RST.11-12.8 WHST.9-10.2 WHST.11-12.2 WHST.9-10.7 WHST. 11-12.7 WHST.9-10.9 WHST.11-12.9 MA.HS.N.Q.A	NRS.01.02.06.a Research the purpose and value of resource inventories and population studies. NRS.01.02.06.b Apply procedure for conducting resource inventories and population studies.		

	NRS.02 Analyze the interrelationships between natural resources and humans.	NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management, protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems. NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc) NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources. NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
2. Soils & the land	1.0 Plan and conduct natural resource management activities that apply logical, reasoned, and scientifically based solutions to natural resource issues and goals.	NRS1.02 Classify different types of natural resources in order to enable protection, conservation, enhancement, and management in particular geographical regions. RST.11-12.1 RST.11-12.7 RST.11-12.8 WHST.9-10.2 WHST.11-12.2 WHST.9-10.7 WHST. 11-12.7 WHST.9-10.9	NRS.01.02.05a Research and examine the characteristics used to identify resources (e.g. soil, types, climate, and geography). NRS.01.05.04.a Compare and contrast techniques associated with soil management (e.g. soil survey and interpretation, erosion, control, etc) NRS.01.05.04.b Analyze a plot of land in order to determine which soil management techniques would be most applicable.	

	NRS.02 Analyze the interrelationships between natural resources and humans.	WHST.11-12.9 MA.HS.N.Q.A NRS.01.05 Apply ecological concepts and principles of terrestrial natural resource systems. RST.11-12.1 RST.11-12.7 RST.11-12.8 MA.HS.S.ID.A MA.HS.S.IC.A MA.HS.S.IC.B NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management, protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems. NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc) NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources. NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
3. Water	NRS.1.0 Plan and conduct natural resource management activities that apply logical, reasoned, and scientifically based solutions to natural resource issues and goals.	NRS 01.04 Apply ecological concepts and principles to aquatic natural resources systems. RST.11-12.1 RST.11-12.7 RST.11-12.8 WHST.9-10.7 WHST.11-12.7 MA.HS.N.Q.A MA.HS.S.ID.A	NRS.01.04.01.a Summarize the roles and properties of watershed. NRS.01.04.01.b Assess the function of watersheds and their effect on natural resources. NRS.01.04.02.a Examine and describe the importance of groundwater and surface water to natural resources.	

	NRS.02 Analyze the interrelationships between natural resources and humans.	<i>MA.HS.S.IC.A</i> <i>MA.HS.S.IC.B</i> NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management, protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	NRS.01.04.02.b Analyze how different classifications of ground and surface water affect ecosystem function. NRS.01.04.03.a Compare and contrast riparian zones and riparian buffers based on their functions. NRS.01.04.03.b Assess techniques used in the creation, enhancement, and management of riparian zones and riparian buffers. NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems. NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc) NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources. NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
4. Air	NRS 1.0 Plan and conduct natural resource management activities that apply logical,	NRS.01.03 Apply ecological concepts and principles to	NRS.01.03.01.a Classify different kinds of biogeochemical cycles and the role they play in natural resource systems.	

	reasoned, and scientifically based solutions to natural resource issues and goals. NRS.02 Analyze the interrelationships between natural resources and humans.	atmospheric natural resource systems. RST.11-12.1 RST.11-12.7 RST.11-12.8 MA.HS.N.Q.A MA.HS.S.ID.A MA.HS.S.IC.A MA.HS.S.IC.B NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management, protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	NRS.01.03.01.b Assess the role that the atmosphere plays in the regulation of biogeochemical cycles. NRS.01.03.02.a Research and summarize how climate factors influence natural resource systems. NRS.01.03.02.b Analyze the impact that climate has on natural resources and debate how this impact has changed due to human activity. NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems. NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc) NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources. NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
--	--	--	---	--

6. Flora & Fauna	NRS 1.0 Plan and conduct natural resource management activities that apply logical, reasoned, and scientifically based solutions to natural resource issues and goals. HS-LS-2-5 Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. NRS.02 Analyze the interrelationships between natural resources and humans.	NRS.01.05 Apply ecological concepts and principles of terrestrial natural resource systems. RST.11-12.1 RST.11-12.7 RST.11-12.8 MA.HS.S.ID.A. MA.HS.S.IC.A MA.HS.S.IC.B NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management, protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection,	NRS.01.05.01.a Research and describe the stages of ecological succession. NRS.01.05.01.b Analyze and summarize examples of stages of succession. NRS.01.05.02.a Compare and contrast the impact of habitat disturbances and habitat resilience. NRS.01.05.02.b Analyze and summarize examples of habitat disturbances and habitat resilience. NRS.01.05.03.a Compare and contrast techniques associated with sustainable forestry (e.g. timber stand improvement, diversity improvement, reforestation, etc) NRS.01.05.03.b Analyze a forest in order to determine which forestry techniques would improve that habitat. NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems. NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc)	
------------------------------------	---	---	--	--

		enhancement, and improvement change and develop over time.	NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources. NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
7. Farming & Forestry	NRS.02 Apply scientific principles to natural resource management activities. NRS.03 Applies knowledge of natural resources to production and processing industries. NRS.04 Demonstrate techniques used to protect natural resources. NRS.02 Analyze the interrelationships between natural resources and humans.	NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management, protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems. NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc) NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources.	

			NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
--	--	--	---	--

8. Human Impacts	NRS.2.0 Analyze the interrelationships between natural resources and humans. HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.* HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. NRS.02 Analyze the interrelationships between natural resources and humans.	NRS.2.02 Assess the impact of human activities on the availability of natural resources. NRS.02.01 Examine and interpret the purpose, enforcement, impact, and effectiveness of laws and agencies related to natural resource management,	NRS.02.02.01.a Summarize the relationship between natural resources, ecosystems, and human activity. NRS.02.02.01.b Assess and explain how different kinds of human activity affect the use and availability of natural resources (i.e. agriculture, industry, transportation, etc) NRS.02.02.02.a Categorize the primary causes of extinction of living species due to human activity (e.g. overharvesting, habitat loss, invasive species, pollution, etc) NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity. NRS.02.02.03.a Examine and describe the manner in which modern lifestyles are related to the depletion of natural resources. NRS.02.02.03.b Identify solutions to improve the sustainability of modern lifestyles. NRS.02.01.01.a Distinguish between the types of laws associated with natural resource systems.	
--------------------------------	---	---	---	--

		protection, enhancement, and improvement (e.g. water regulation, game laws, historic preservation laws, environmental policy, etc) NRS.02.03 Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	NRS.02.01.01.b Analyze the structure of laws associated with natural resource systems. NRS.02.01.02.a Distinguish between types of agencies associated with natural resource systems. NRS.02.01.02.b Analyze the specific purpose of agencies associated with natural resource systems. NRS.02.03.01.a Summarize and categorize the different social considerations in regards to the use of natural resources (e.g. public vs private, laws and regulations, economics, green technology, etc) NRS.02.03.01.b Analyze how social consideration can affect the use and sustainability of natural resources. NRS.02.02.02.b Assess causes of extinction and describe how those causes related to loss of biodiversity.	
9. Mining and extraction	NRS.02 Analyze the interrelationships between natural resources and humans. NRS.03 Develop plans to ensure sustainable production and processing of natural resources.	NRS.02.02 Assess the impact of human activities on the availability of natural resources. NRS.02.04 Examine and explain how economics affects the use of natural resources. NRS.03.01 Sustainably produce, harvest, process and use natural resource products (e.g. forest products, wildlife, minerals, fossil fuels, shale oil, alternative energy, recreation, aquatic species, etc)	NRS.02.02.01.a Summarize the relationship between natural resources, ecosystems, and human activity. NRS.02.04.01.a Compare and contrast how the economic value of a natural resource affects its availability. NRS.03.01.03.a Compare and contrast the costs and benefits (e.g. impacts on environmental, economic, wildlife, etc) of mineral extraction to a local, state, and/or national economy. NRS.03.01.03.b Assess the economic impact of mineral extraction in regards to the costs and benefits to a local, state, and/or national economy.	

			NRS.03.01.03.c Evaluate methods used to extract and process minerals for economic, environmental, and social sustainability.	
10. System Interactions	HS-ESS3-6 Use computational representation to illustrate the relationship among Earth's systems and how those relationships are being modified due to human activity.			

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc)

[CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Standard 1: Oral Expression and Listening

- Prepared Graduate 1: Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.
 - Students collaborate to analyze the relationships between natural resource systems, human activities, environmental policies, and resource management strategies while evaluating sustainable solutions to environmental and economic challenges.

Standard 2: Reading for All Purposes

- Prepared Graduate 4: Read a wide range of informational texts to build knowledge and to better understand the human experience.
 - Students analyze scientific, economic, legal, and environmental information related to natural resource management, biodiversity loss, environmental policy, sustainability, mining and extraction practices, and human impacts on Earth systems.
- Prepared Graduate 5: Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.
 - Students develop and apply specialized vocabulary related to ecosystems, biodiversity, sustainability, environmental policy, natural resource management, economics, mineral extraction, and Earth system interactions.

Standard 3: Writing and Composition

- Prepared Graduate 7: Craft informational/explanatory texts using techniques specific to the genre.

- Students develop scientific explanations, sustainability analyses, environmental assessments, and policy evaluations to communicate the relationships among natural resources, human activities, economic systems, and environmental sustainability.

Standard 4: Research Inquiry and Design

- Prepared Graduate 10: Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.
 - Students investigate the impacts of human activities on natural resource systems by analyzing environmental policies, biodiversity loss, resource extraction practices, economic considerations, and sustainability strategies to evaluate complex environmental and societal challenges.

Note: *Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.*