

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 1: STUDYING THE EARTH		
Big Questions	Formative/ Summative Assessments	
<ol style="list-style-type: none"> 1. What are Earth’s unique characteristics that make life possible? 2. What is environmental science and how does it compare to other scientific disciplines? 3. What are global changes in the environment and how have these changes affected the Earth’s ability to support life? 4. What are the needs of individual organisms at an ecosystem level? 	Formative and summative assessments created by teachers/teams Options include, but are not limited to: <ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003), Unit 1: Studying the Earth Exam (includes Chapters 1-3) 	
Curriculum Benchmark	Standards of Proficiency	Resources/Activities
	Description of what students must show to demonstrate proficiency (created by teachers/teams)	
Compare and contrast the interaction of tectonic plates at the different types of plate boundaries. (9.3.1.1.1)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Worksheets, Chapters 1-3
Use modern earthquake data to explain how seismic activity is evidence for the process of subduction. (9.3.1.1.2)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Worksheets, Chapters 1-3
Explain how the Earth evolved into its habitable form through interactions among the solid earth, the oceans, the atmosphere and organisms. (9.3.3.2.2)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Steam Flow Lab • Worksheets, Chapters 1-3
Compare and contrast the environmental conditions that make life possible on Earth with conditions found on the other planets and moons of our solar system. (9.3.3.2.3)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Biosphere Lab • Worksheets, Chapters 1-3
READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”)		
Benchmark	Activities	How Assessed
Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account (11.13.1.1) (Quarters 3/4)	Environmental News Network (web based)	Written Report
Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms (11.13.2.2) (Quarters 3/4)	Chapter Review	Worksheet

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”) (continued)		
Benchmark	Activities	How Assessed
Follow precisely a complex multistep procedure when carrying out experiments, designing solutions, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text (11.13.3.3) (Quarter 3)	Stream Flow Lab	Lab Report
Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas (11.13.5.5) (Quarters 3/4)	Chapter Review	Worksheet
Analyze the author’s purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text, identifying important issues and questions that remain unresolved. (11.13.6.6) (Quarters 3/4)	Environmental News Network (web based)	Written Report
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. (11.13.7.7) (Quarter 3)	Biosphere and Biomes Lab Project	PowerPoint and Lab Report
Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information (11.13.8.8) (Quarter 3)	Stream Flow Lab	Lab Report

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 2: ECOLOGY AND ECOSYSTEMS		
Big Questions	Formative/ Summative Assessments	
<ol style="list-style-type: none"> 1. How is matter and energy transferred through an ecosystem via food chains, food webs, and chemical cycles? 2. What are ecosystem dynamics and how do interactions help to define ecosystems? 3. How is balance maintained in an ecosystem? 	Formative and summative assessments created by teachers/teams Options include, but are not limited to: <ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003), Unit 2: Ecology and Ecosystems Exam (includes chapters 4-6) • Exotic Species PowerPoint project 	
Curriculum Benchmark	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Explain how matter and energy is transformed and transferred among organisms in an ecosystem, and how energy is dissipated as heat into the environment. (9.4.2.2.2)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Food Web diagram • Chemical Cycles diagram • Worksheets, Chapters 4-6
Explain how ecosystems can change as a result of the introduction of one or more new species. (9.4.2.1.2)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Computer Lab – Alien species • Worksheets, Chapters 4-6
Describe the social, economic and ecological risks and benefits of changing a natural ecosystem as a result of human activity. (9.4.4.1.2)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Deer population graph • Worksheets, Chapters 4-6
READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”)		
Benchmark	Activities	How Assessed
Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account (11.13.1.1) (Quarters 3/4)	Environmental News Network (web based)	Written Report
Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms (11.13.2.2) (Quarters 3/4)	Chapter Review	Worksheet
Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. (11.13.5.5) (Quarters 3/4)	Chapter Review	Worksheet

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”) (continued)		
Benchmark	Activities	How Assessed
Analyze the author’s purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text, identifying important issues and questions that remain unresolved (11.13.6.6) (Quarters 3/4)	Environmental News Network (web based)	Written Report

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 3: BIOMES		
Big Questions	Formative/ Summative Assessments	
<ol style="list-style-type: none"> 1. What are the characteristics of the world’s biomes? 2. What is the role of climate and geography in determining a biome? 3. How is human activity affecting the world’s biomes? 	<p style="text-align: center; margin: 0;">Formative and summative assessments created by teachers/teams</p> <p>Options include, but are not limited to:</p> <ul style="list-style-type: none"> “Environmental Science” (Scott Foresman-Addison Wesley, 2003), Unit 3: Biomes Exam (includes Chapters 7-11) Biomes PowerPoint project 	
Curriculum Benchmark	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
<p>Explain how Earth’s rotation, ocean currents, configuration of mountain ranges, and composition of the atmosphere influence the absorption and distribution of energy, which contributes to global climatic patterns. (9.3.2.2.1)</p>		<ul style="list-style-type: none"> “Environmental Science” (Scott Foresman-Addison Wesley, 2003) Climate Graphs Worksheets, Chapters 7-11
<p>Explain how human activity and natural processes are altering the hydrosphere, biosphere, lithosphere and atmosphere, including pollution, topography and climate. (9.3.4.1.2)</p>		<ul style="list-style-type: none"> “Environmental Science” (Scott Foresman-Addison Wesley, 2003) Climate Graphs Worksheets, Chapters 7-11
READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”)		
Benchmark	Activities	How Assessed
<p>Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account (11.13.1.1) (Quarters 3/4)</p>	<p>Environmental News Network (web based)</p>	<p>Written Report</p>
<p>Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms (11.13.2.2) (Quarters 3/4)</p>	<p>Chapter Review</p>	<p>Worksheet</p>
<p>Determine the meaning of symbols, equations, graphical representations, tabular representations, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics. (11.13.4.4) (Quarter 3)</p>	<p>Climate Graphs</p>	<p>Construct Graphs (4)</p>
<p>Analyze how the text structure information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. (11.13.5.5) (Quarters 3/4)</p>	<p>Chapter Review</p>	<p>Worksheet</p>

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”) (continued)		
Benchmark	Activities	How Assessed
Analyze the author’s purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text, identifying important issues and questions that remain unresolved. (11.13.6.6) (Quarters 3/4)	Environmental News Network (web based)	Written Report

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 4: PEOPLE IN THE GLOBAL ECOSYSTEM		
Big Questions	Formative/ Summative Assessments	
<ol style="list-style-type: none"> 1. How have humans impacted the environment over time? 2. What factors affect population size? 3. What are population growth trends in developing and industrialized nations? 	Formative and summative assessments created by teachers/teams Options include, but are not limited to: <ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003), Unit 4: People in the Global Ecosystem Exam (includes Chapters 13-14) 	
Curriculum Benchmark	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Describe factors that affect the carrying capacity of an ecosystem and relate these to population growth. (9.4.2.1.1)		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • Population dynamics activity • Worksheets, Chapters 13-14 • “People Bomb” film
READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”)		
Benchmark	Activities	How Assessed
Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (11.13.1.1) (Quarters 3/4)	Environmental News Network (web based)	Written Report
Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. (11.13.2.2) (Quarters 3/4)	Chapter Review	Worksheet
Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. (11.13.5.5) (Quarters 3/4)	Chapter Review	Worksheet
Analyze the author’s purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text, identifying important issues and questions that remain unresolved. (11.13.6.6) (Quarters 3/4)	Environmental News Network (web based)	Written Report

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 4: PEOPLE IN THE GLOBAL ECOSYSTEM		
READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”) (continued)		
Benchmark	Activities	How Assessed
Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (11.13.9.9) (Quarter 4)	Population Dynamics People Bomb Film	Packet and Written Report
By the end of grade 12, read and comprehend technical texts in the grades 11-12 text complexity band independently and proficiently. (11.13.10.10) (Quarter 4)	Minnesota DNR Wolf Management Plan Analysis	Discussion Questions

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 5: ENERGY RESOURCES		
Big Questions	Formative/ Summative Assessments	
<ol style="list-style-type: none"> 1. What are organic fuels and how has their use changed over time? 2. What are significant environmental concerns regarding non-renewable energy resources? 3. What are renewable energy resources? 4. What are the limitations associated with each type of renewable energy resource? 	<p style="text-align: center; font-size: small;">Formative and summative assessments created by teachers/teams</p> <p>Options include, but are not limited to:</p> <ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003), Unit 5: Energy Resources Exam (includes chapters 15-17) • Energy Resources PowerPoint project 	
Curriculum Benchmark	Standards of Proficiency <small>Description of what students must show to demonstrate proficiency (created by teachers/teams)</small>	Resources
<p>Recognize that risk analysis is used to determine the potential positive and negative consequences of using new technology or design, including the evaluation of causes and effects of failures. (9.1.2.1.2)</p>		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • ANWR Petroleum reserve media center activity • Yucca Mountain – storing radioactive waste media center activity • Fission diagrams • Worksheets, Chapters 15-17
<p>Identify a problem and the associated constraints on possible design solutions. (9.1.2.2.1)</p>		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • ANWR Petroleum reserve media center activity • Yucca Mountain – storing radioactive waste media center activity • Fission diagrams • Worksheets, Chapters 15-17
<p>Describe how values and constraints affect science and engineering. (9.1.3.3.1)</p>		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • ANWR Petroleum reserve media center activity • Yucca Mountain – storing radioactive waste media center activity • Fission diagrams • Worksheets, Chapters 15-17
<p>Determine and use appropriate safety procedures, tools, computers and measurement instruments in science and engineering contexts. (9.1.3.4.2)</p>		<ul style="list-style-type: none"> • “Environmental Science” (Scott Foresman-Addison Wesley, 2003) • ANWR Petroleum reserve media center activity • Yucca Mountain – storing radioactive waste media center activity • Fission diagrams • Worksheets, Chapters 15-17

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”)		
Benchmark	Activities	How Assessed
Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account (11.13.1.1) (Quarters 3/4)	Environmental News Network (web based)	Written Report
Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms (11.13.2.2) (Quarters 3/4)	Chapter Review	Worksheet
Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. (11.13.5.5) (Quarters 3/4)	Chapter Review	Worksheet
Analyze the author’s purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text, identifying important issues and questions that remain unresolved. (11.13.6.6) (Quarters 3/4)	Environmental News Network (web based)	Written Report

GRADES 10-12: SCIENCE AND ENVIRONMENT CURRICULUM FRAMEWORKS

UNIT 6: CAREERS AND CURRENT EVENTS		
Big Questions	Formative/ Summative Assessments	
1. What are some career options in environmental science? 2. What are some current significant global environmental issues?	Formative and summative assessments created by teachers/teams Options include, but are not limited to: <ul style="list-style-type: none"> Worksheet – Current Events and Careers 	
Curriculum Benchmark	Standards of Proficiency Description of what students must show to demonstrate proficiency (created by teachers/teams)	Resources
Analyze possible careers in science and engineering in terms of education requirements, working practices and rewards.		<ul style="list-style-type: none"> Media center activity on “Current Events and Careers”
READING IN THE CONTENT AREA (Taken from “Standards for Literacy in History/Social Studies/Science/Technical Subjects”)		
Benchmark	Activities	How Assessed
Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account (11.13.1.1) (Quarters 3/4)	Environmental News Network (web based)	Written Report
Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms (11.13.2.2) (Quarters 3/4)	Chapter Review	Worksheet
Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. (11.13.5.5) (Quarters 3/4)	Chapter Review	Worksheet
Analyze the author’s purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text, identifying important issues and questions that remain unresolved. (11.13.6.6) (Quarters 3/4)	Environmental News Network (web based)	Written Report