



Environmental Literacy Standards Framework

Introduction

The Code of Maryland Regulations (COMAR) 13A.04.17.01, Requirements for Environmental Literacy Instructional Programs for Grades Prekindergarten - 12 states that each local school education agency “shall provide in public schools a comprehensive, multi-disciplinary environmental literacy program infused within current curricular offerings and aligned with the Maryland Environmental Literacy Standards.”

State Frameworks are developed by the Maryland State Department of Education (MSDE) to support local education agencies in providing high-quality instructional programs in Environmental Literacy. State Frameworks are defined as supporting documents and provide guidance for implementing the State Standards in Environmental Literacy which are reviewed and adopted by the Maryland State Board of Education every eight years. State Frameworks also provide consistency in learning expectations for students in environmental literacy programs across the twenty-four local education agencies as local curriculum is developed and adopted using these documents as a foundation.

MSDE shall update the State Framework in Environmental Literacy in the manner and time the State Superintendent of Schools determines is necessary to ensure alignment with best-in-class, research-based practices. Tenure and stability of State Frameworks afford local education agencies the necessary time to procure supporting instructional materials, provide professional development, and to measure student growth within the program. Educators, practitioners, and experts who participate in writing workgroups for State Frameworks represent the diversity of stakeholders across Maryland. The State Framework in Environmental Literacy was developed, reviewed, and revised by teams of Maryland educators and practitioners, including local education agency content curriculum specialists, classroom teachers, accessibility staff, and other experts who worked in close collaboration with MSDE.

The Prekindergarten to Grade 12 Environmental Literacy Framework was released in March 2023.

Using this Document

The Prekindergarten to Grade 12 Environmental Literacy Framework is sequenced according to the Maryland Environmental Literacy Standards. Use the hyperlinks in the table below to navigate to each standard within the framework.

STANDARD	DESCRIPTION OF STANDARD
<u>Standard 1: Environmental Issue Investigation and Action</u>	Environmentally literate students investigate environmental issues in order to develop and implement local actions that protect, sustain, or restore the natural environment.
<u>Standard 2: Human Dependence on Earth Systems and Natural Resources</u>	Environmentally literate students construct and apply understanding of how Earth’s systems and natural resources support human existence.
<u>Standard 3: Environmental Impact of Human Activity</u>	Environmentally literate students construct and apply understanding of the environmental impact of human activities on Earth’s systems and resources.
<u>Standard 4: Consequences of Environmental Change on Human Health and Well-Being</u>	Environmentally literate students construct and apply understanding of the consequences of human-induced environmental change on individual and collective health and well-being.
<u>Standard 5: Individual and Collective Responses to Environmental Change</u>	Environmentally literate students construct and apply understanding of individual, collective, and societal responses to human-induced environmental change.

To increase the practical utility of the standards, each is subdivided into grade bands where relevant enduring understandings, objective statements, essential questions, and related content standards have been identified. The following table illustrates this organization and defines each of the components.

GRADE BAND: Grade band refers to the set of grades for which the content is relevant and are organized as primary (PreK-2), intermediate (3-5), middle school (6-8), and high school (9-12).

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Enduring Understandings are the overarching, conceptual, and long-term goals for each standard. They offer insight into why this learning is important.</p>	<p>Objective Statements provide context for students’ learning. They define what learning should occur related to the standard by the end of the indicated grade band.</p>	<p>Essential Questions help teachers and students unpack the big ideas in the enduring understandings and make connections to the objectives related to the standard in that grade band.</p>	<p>Content Standards refer to other Maryland Content Standards aligned with the Environmental Literacy standard. These include Science, Social Studies, ELA/Literacy, Mathematics, and Health Education.</p>

The following appendices provide additional information.

- Appendix A – Grade Band Progressions
- Appendix B – Phenomena for Environmental Literacy
- Appendix C – Instructional Resources for Environmental Literacy
- Appendix D – Research Supporting Environmental Literacy

Standard 1: Environmental Issue Investigation & Action

Environmentally literate students investigate environmental issues in order to develop and implement local actions that protect, sustain, or restore the natural environment.

GRADE BAND: PreK-Grade 2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Everyone is responsible for understanding environmental issues and taking actions that result in positive change.</p>	<p>By the end of grade 2, students will:</p> <ul style="list-style-type: none"> A. Explore and experience the environment. B. Confirm a local environmental issue. C. With guidance, develop an action plan to address the issue. D. Implement the action plan. 	<ul style="list-style-type: none"> • What are our responsibilities toward protecting the environment? • How can we identify local environmental issues, and develop a plan of action to address the issue? • How can we identify needed resources and communicate to others about our planned actions aimed at addressing a local environmental issue? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): K-ESS2-2; K-ESS3-1; K-ESS3-3 • Life Science (LS): K-LS1-1; 2-LS2-1 <p>Social Studies</p> <ul style="list-style-type: none"> • PreK, Unit 1: Civics, Unit 2 Geography, Unit 3: Economics, Standard 6.0 • K, Unit 1: Civics, Unit 2: Geography, Unit 3 Economics, Standard 6.0 • Grade 1, Unit 1: Civics, Unit 2 Geography, Unit 3: Economics, Standard 6.0 • Grade 2, Unit 1: Civics, Unit 2 Geography, Unit 3: Economics, Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.K.1; W.K.2; W.K.7; W.2.1; W.2.2; W.2.3; W.2.5; W.2.6; W.2.8 • Reading Informational Texts (RI): RI.K.1; RI.2.1; RI.2.2; RI.2.3; RI.2.4; RI.2.5; RI.2.6; RI.2.7; RI.2.8 • Speaking and Listening (SL): SL2.5 • Reading (R): Anchor Standard R.1

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4; MP.5 • Measurement & Data (MD): K.MD.A.2; K.MD.A.5; 2.MD.D.10 • Counting and Cardinality (CC): K.CC.B.4; K.CC.C.6 <p>Health Education</p> <ul style="list-style-type: none"> • Safety and Violence Prevention: 1d.1.1; 1d.1.3

GRADE BAND: Grades 3-5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Everyone can positively impact the environment by thinking creatively, utilizing evidence for solving problems, and critically evaluating possible environmental impacts.</p>	<p>By the end of grade 5, students will:</p> <p>A. Identify a local environmental issue through observation and/or research.</p> <p>B. Use evidence to construct explanations and generate possible solutions to the environmental issue.</p> <p>C. Develop an action plan to protect, sustain, or restore the natural environment.</p> <p>D. Implement the environmental action plan and reflect on the impact and effectiveness of the plan.</p>	<ul style="list-style-type: none"> • How can we identify, research, and take local action to protect, sustain or restore the natural environment? • How can we gather evidence to generate solutions related to a local environmental issue? • How can we evaluate the impact of our action plan? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): 4-ESS3-1; 5-ESS2-1; 5-ESS3-1 • Life Science (LS): 3-LS4-3; 3-LS4-4; 5-LS2-1 • Engineering, Technology, and the Application of Science (ETS): 3-5 ETS1-1; 3-5 ETS1-2; 3-5 ETS 1-3 <p>Social Studies</p> <ul style="list-style-type: none"> • Grade 3, Unit 1: Civics, Unit 2: Economics and Geography, Standard 6.0 • Grade 4, Unit 1: Worlds Collide (1450 – 1650), Standard 6.0 • Grade 5, Unit 3: The Challenges of American Economic, Political, and Civic Life (1900 – Today), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): Anchor Standard W.7; W.3.1; W.3.2; W.5.8; W.5.9 • Reading Informational Texts (RI): Anchor Standard RI.9; RI.3.1; RI.3.2; RI.3.3; RI.5.1; RI.5.7; RI.5.9 • Speaking and Listening (SL): Anchor Standard SL.1; Anchor Standard SL.4; SL.3.4; SL.5.5 • Language (L): Anchor Standard L.4 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Measurement & Data (MD): 3.MD.B.3; 5.MD.B.2 • Geometry (G): 5.G.A.2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.5.5 • Safety and Violence Prevention: 1d.4.2; 1d.4.3; 1d.5.1; 1d.5.3 • Analyzing Influences: 2.E2.c • Advocacy: 8.E2.b

GRADE BAND: Grades 6-8

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Community membership has rights and responsibilities in promoting environmental sustainability both locally and globally that requires an understanding of short- and long-term consequences of personal and group actions and acceptance of responsibility for these actions.</p>	<p>By the end of grade 8, students will:</p> <ul style="list-style-type: none"> A. Identify and investigate a local or global environmental issue that impacts a variety of stakeholder groups. B. Research and explore the perspectives of the various stakeholder groups. C. Analyze evidence to construct explanations and use data to form conclusions. D. Develop an action plan to protect, sustain, or restore the natural environment and weigh the impact on various stakeholder groups. E. Implement the environmental action plan and reflect on the impact of the plan on the various stakeholder groups. 	<ul style="list-style-type: none"> • How can we identify, evaluate, and take local action to protect, sustain or restore the natural environment? • How do local or global environmental issues impact various stakeholder groups? • How can we evaluate our individual and group actions' short- and long-term consequences? • How can we identify and consider the needs and priorities of various stakeholders concerning our selected actions? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): MS-ESS2-1; MS-ESS2-2; MS-ESS2-6; MS-ESS3-1; MS-ESS3-3; MS-ESS3-4; MS-ESS3-5 • Life Science (LS): MS-LS1-5; MS-LS2-1; MS-LS2-2; MS-LS2-3; MS-LS2-4; MS-LS2-5; MS-LS4-6 • Physical Science (PS): MS-PS1-3 • Engineering, Technology, and the Application of Science (ETS): MS-ETS1-1; MS-ETS1-2; MS-ETS1-3; MS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • Grades 6 and 7, Revised frameworks to be released in 2023 • Middle School United States History Grade 8, Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.6-8.1; WHST.6-8.2; WHST.6-8.7; WHST.6-8.8; WHST.6-8.9 • Reading Informational Texts (RI): RI.8.8 • Reading in Science & Technical Subjects (RST): RST.6-8.1; RST.6-8.3; RST.6-8.7; RST.6-8.8; RST.6-8.10 • Speaking and Listening (SL): SL.8.1; SL.8.4; SL.8.5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Ratio & Proportional Relationships (RP): 6.RP.A.3 • Expression & Equations (EE): 6.EE.C.9 • Statistics & Probability (SP): 6.SP.B.5 <p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.8.6 • Decision Making: 5.MS.a; 5.MS.c • Goal-Setting: 6.MS.b • Self-Management: 7.MS.a; 7.MS.c

GRADE BAND: Grades 9-12

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Everyone can exhibit personal agency by exercising individual rights and responsibilities in addressing environmental, social, and economic sustainability while recognizing the mechanisms that may disproportionately affect underrepresented groups and proposing strategies for meaningfully connecting with diverse stakeholders.</p>	<p>By the end of grade 12, students will:</p> <p>A. Examine an environmental issue in the context of the local and global environment and human behaviors that contribute to it.</p> <p>B. Evaluate evidence-based solutions to mitigate or prevent the environmental impacts associated with the environmental issue.</p> <p>C. Formulate individual and collective actions that can be undertaken to address local environmental issues considering cultural, social, economic, and political factors as they relate to the development of solutions.</p> <p>D. Critique the feasibility of the plan including the economic requirements, and the willingness/ability of stakeholders to participate in the plan.</p> <p>E. Implement the plan based on the environmental issue investigation and evaluate the success of actions taken.</p>	<ul style="list-style-type: none"> • How can we monitor our environment’s health and make evidence-based decisions to inform our actions? • How do cultural, social, and economic factors influence decisions regarding actions to mitigate the effects of human activity on the environment? • How can we examine, implement, evaluate, and critique an action plan to protect, sustain or restore the natural environment while engaging diverse stakeholders? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): HS-ESS2-2; HS-ESS2-4; HS-ESS2-5; HS-ESS3-1; HS-ESS3-2; HS-ESS3-3; HS-ESS3-4; HS-ESS3-5; HS-ESS3-6 • Life Science (LS): HS-LS2-1; HS-LS2-2; HS-LS2-6; HS-LS2-7; HS-LS3-2; HS-LS4-5; HS-LS4-6 • Engineering, Technology, and the Application of Science (ETS): HS-ETS1-1; HS-ETS1-2; HS-ETS1-3; HS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • High School American Government, Unit: Domestic Policy, Unit: Executive Branch, Unit: Economics, Standard 6.0 • Modern World History (1970 – Present), Unit: Globalization, Standard 6.0 • High School United States History, Unit: Economic, Political, and Social Reorganization (1974-1992), Unit: Globalization, Terrorism, and Political Polarization (1992- Present), Standard 6.0

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.9-10.1; W.9-10.2 • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.9-12.5; WHST.9-12.7 • Reading Informational Texts (RI): RI.9-10.1; RI.9-10.2 • Reading in Science & Technical Subjects (RST): RST.9-10.7; RST.9-10.8; RST.9-10.9; RST.11-2.7; RST11-12.8 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2 • High School: Number and Quantity (HSN.Q): HSN.Q.A.1; HSN.Q.A.2; HSN.Q.A.3 <p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.HS1.2; 1a.HS2.2; 1a.HS2.5 • Decision-Making: 5.HS.a; 5.HS.b; 5.HS.c; 5.HS.d; 5.HS.e; 5.HS.f; 5.HS.g • Goal-Setting: 6.HS.b • Advocacy: 8.HS.b; 8.HS.c

Standard 2: Human Dependence on Earth Systems and Natural Resources

Environmentally literate students construct and apply understanding of how Earth’s systems and natural resources support human existence.

GRADE BAND: PreK-Grade 2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>The Earth includes many interacting systems that humans interact with, change, and depend upon for survival.</p>	<p>By the end of grade 2, students will:</p> <ul style="list-style-type: none"> A. Describe characteristics of the environment. B. Identify what humans need to survive and describe how the Earth meets those needs. C. Describe how the environment influences human activity. 	<ul style="list-style-type: none"> • How is the environment vital to human survival? • How does the environment influence human activities? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): K-ESS2-2; K-ESS3-1; K-ESS3-3; 2-ESS1-1; 2-ESS2-2; 2-ESS2-3 • Life Science (LS): K-LS1-1; 2-LS2-1; 2-LS4-1 <p>Social Studies</p> <ul style="list-style-type: none"> • PreK, Unit 2 Geography, Standard 6.0 • K, Unit 2: Geography, Standard 6.0 • Grade 1, Unit 2 Geography, Standard 6.0 • Grade 2, Unit 2 Geography, Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.2.1; W.2.2; W.2.3; W.2.5; W.2.6; W.2.8 • Reading Informational Texts (RI): RI.2.1; RI.2.2; RI.2.3; RI.2.4; RI.2.5; RI.2.6; RI.2.7; RI.2.8 • Reading (R): Anchor Standard R.1 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4; MP.5

GRADE BAND: Grades 3-5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Local environments are made up of unique natural systems and resources that change over time and include resources that help humans survive, conduct required and recreational activities, and express multiple and varied cultures.</p>	<p>By the end of grade 5, students will:</p> <ul style="list-style-type: none"> A. Investigate the natural systems and natural resources of Maryland’s environment. B. Analyze how Maryland’s natural systems and natural resources help Marylanders survive. C. Identify how the local environment influences human activity and local culture. D. Investigate how dependence on natural systems and natural resources in Maryland has changed over time and across various populations. 	<ul style="list-style-type: none"> • How do Maryland's natural systems and resources impact human survival, conduct, and recreational activities? • How does the local environment influence human activity and local culture? • How has human dependence on the local environment changed over time and across various populations? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): 3-ESS2-2; 4-ESS3-1; 5-ESS2-1; 5-ESS2-2; 5-ESS3-1 • Life Science (LS): 3-LS4-3; 3-LS4-4; 5-LS2-1 <p>Social Studies</p> <ul style="list-style-type: none"> • Grade 3, Unit 2: Economics and Geography, Standard 6.0 • Grade 4, Unit 1: Worlds Collide (1450 – 1650), Standard 6.0 • Grade 5, Unit 3: The Challenges of American Economic, Political, and Civic Life (1900 – Today), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): Anchor Standard W.7; W.3.1; W.3.2; W4.7; W.5.8; W.5.9 • Reading Informational Texts (RI): Anchor Standard RI.9; RI.3.1; RI.3.2; RI.3.3; RI4.7; RI.5.1; RI.5.7; RI.5.9 • Speaking and Listening (SL): Anchor Standard SL.1; Anchor Standard SL.4; SL.3.4 • Language (L): Anchor Standard L.4 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Measurement & Data (MD): 3.MD.B.3; 4.MD.A.2; 5.MD.B.2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Health Education</p> <ul style="list-style-type: none"> • Analyzing Influences: 2.E2.c • Advocacy: 8.E2.b

GRADE BAND: Grades 6-8

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Natural resources, which are finite, rare, and varying in their renewability, support and sustain all life on earth by providing food, fuel, and raw materials. However, the unequal distribution of natural resources across the Earth may impact cultural and societal views on those resources and sustainability.</p>	<p>By the end of grade 8, students will:</p> <ul style="list-style-type: none"> A. Identify how the availability of natural resources impacts human society. B. Analyze how Earth’s systems and natural resources support and sustain all life. C. Explain how the natural history of the region has produced features of the natural environment and how those features have supported human existence over time. D. Evaluate how the local environment influences where people live and what they do. 	<ul style="list-style-type: none"> • How do life and humans depend on Earth’s resources? • How do natural resources and their distribution impact human society and culture? • How do cultural and societal views impact environmental decisions? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): MS-ESS2-1; MS-ESS2-2; MS-ESS2-4; MS-ESS2-6; MS-ESS3-1; MS-ESS3-3; MS-ESS3-4 • Life Science (LS): MS-LS1-5; MS-LS1-6; MS-LS1-7; MS-LS2-1; MS-LS2-2; MS-LS2-3; MS-LS2-4; MS-LS2-5; MS-LS4-5; MS-LS4-6 • Physical Science (PS): MS-PS1-3 <p>Social Studies</p> <ul style="list-style-type: none"> • Grades 6 and 7, Revised frameworks to be released in 2023. • Middle School United States History Grade 8, Unit: Colonization (1607-1754), Unit: Growth of Industrial America (1877-1890), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.6-8.1; WHST.6-8.2; WHST.6-8.7; WHST.6-8.8; WHST.6-8.9 • Reading Informational Texts (RI): RI.8.8 • Reading in Science & Technical Subjects (RST): RST.6-8.1; RST.6-8.3; RST.6-8.7; RST.6-8.8; RST.6-8.10 • Speaking and Listening (SL): SL.8.1; SL.8.4; SL.8.5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Ratio & Proportional Relationships (RP): 6.RP.A.3 • Expression & Equations (EE): 6.EE.C.9 • Statistics & Probability (SP): 6.SP.B.5 <p>Health Education</p> <ul style="list-style-type: none"> • Healthy Eating: 1e.6.3 • Decision Making: 5.MS.a; 5.MS.c • Goal-Setting: 6.MS.b • Self-Management: 7.MS.a; 7.MS.c

GRADE BAND: Grades 9-12

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Humans’ physical, emotional, and psychological health and well-being depend on the development of sustainable practices related to natural resources that support modern civilization while maintaining healthy ecosystems.</p>	<p>By the end of grade 12, students will:</p> <ul style="list-style-type: none"> A. Analyze how humans alter natural systems to meet their needs, including the role of technology. B. Clarify how ecosystem services are essential for human life and how these services impact the quality of life, including physical health, and emotional and psychological well-being. C. Support the value of biodiversity-related experiences as essential components in developing a sense of place. D. Illustrate how sustaining a healthy ecosystem supports the continued existence of humans on the Earth. 	<ul style="list-style-type: none"> • How does a healthy ecosystem relate to human physical, emotional, and psychological health and well-being? • How does the development of sustainable practices in modern civilization around natural resources maintain healthy ecosystems? • How does technology contribute to humans altering natural systems to meet their needs? • How does the experience of biodiversity contribute to the development of a sense of place? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): HS-ESS2-2; HS-ESS2-4; HS-ESS2-5; HS-ESS2-7; HS-ESS3-1; HS-ESS3-2; HS-ESS3-3; HS-ESS3-4; HS-ESS3-5; HS-ESS3-6 • Life Science (LS): HS-LS2-1; HS-LS2-2; HS-LS2-6; HS-LS2-7; HS-LS4-5 • Engineering, Technology, and the Application of Science (ETS): HS-ETS1-1; HS-ETS1-2; HS-ETS1-3; HS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • High School American Government, Unit: Domestic Policy, Unit: Executive Branch, Unit: Economics, Standard 6.0 • Modern World History (1970 – Present), Unit: Globalization, Standard 6.0 • High School United States History, Unit: Economic, Political, and Social Reorganization (1974-1992), Unit: Globalization, Terrorism, and Political Polarization (1992- Present), Standard 6.0

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
	<p>E. Analyze the various challenges associated with natural resource extraction, use, and conservation.</p>		<p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.9-10.1; W.9-10.2 • Reading Informational Texts (RI): RI.9-10.1; RI.9-10.2 • Reading in Science & Technical Subjects (RST): RST.9-10.7; RST.9-10.8; RST.9-10.9; RST.11-2.1; RST.11-12.8 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2 <p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.HS1.2; 1a.HS2.2; 1a.HS2.3; 1a.HS2.4

Standard 3: Environmental Impact of Human Activity

Environmentally literate students construct and apply understanding of the environmental impact of human activities on Earth’s systems and resources.

GRADE BAND: PreK-Grade 2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Humans have changed Earth’s landscape and natural habitats to meet their needs, and these actions have lasting impacts which will need to be mitigated as the human population continues to grow.</p>	<p>By the end of grade 2, students will:</p> <ul style="list-style-type: none"> A. Generate a list of environmental impacts caused by human activity. B. Describe alternative ways of meeting human needs that limit the impact on our environment. C. Cite examples of how humans have altered their environment to meet their needs. 	<ul style="list-style-type: none"> • How do humans alter their environment to meet their wants and needs? • What are some possible impacts of human alteration on the environment? • How can we reduce the impact of human activity on the environment as the human population grows? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): K-ESS2-2; K-ESS3-1; K-ESS3-3; 2-ESS2-1; 2-ESS2-2; 2-ESS2-3 • Life Science (LS): K-LS1-1; 2-LS2-1; 2-LS4-1 <p>Social Studies</p> <ul style="list-style-type: none"> • PreK, Unit 2 Geography, Standard 6.0 • K, Unit 2: Geography, Standard 6.0 • Grade 1, Unit 2 Geography, Standard 6.0 • Grade 2, Unit 2 Geography, Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.2.1; W.2.2; W.2.3; W.2.5; W.2.6; W.2.8 • Reading Informational Texts (RI): RI.2.1; RI.2.2; RI.2.3; RI.2.4; RI.2.5; RI.2.6; RI.2.7; RI.2.8 • Reading (R): Anchor Standard R.1 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4; MP.5

GRADE BAND: Grades 3-5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Human activities impact the environment in many varied ways with different levels of environmental impact, and humans can make choices that are better for the environment.</p>	<p>By the end of grade 5, students will:</p> <ul style="list-style-type: none"> A. Evaluate the level of environmental impact from local human activities. B. Identify ways of meeting human needs with respect to their environmental impacts. C. Identify choices that have a positive impact on the environment. 	<ul style="list-style-type: none"> • How do various human activities impact the environment at different levels? • How can we meet human needs but also limit our impact on the environment? • What are some choices humans can make to have a positive environmental impact? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): 4-ESS3-1; 5-ESS2-1; 5-ESS3-1 • Life Science (LS): 3-LS4-3; 3-LS4-4; 5-LS2-1 • Engineering, Technology, and the Application of Science (ETS): 3-5 ETS1-1; 3-5 ETS1-2; 3-5 ETS 1-3 <p>Social Studies</p> <ul style="list-style-type: none"> • Grade 5, Unit 3: The Challenges of American Economic, Political, and Civic Life (1900 – Today), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): Anchor Standard W.7; W.3.1; W.3.2; W4.7; W.5.8; W.5.9 • Reading Informational Texts (RI): Anchor Standard RI.3; RI.3.1; RI.3.2; RI.3.3; RI.5.7 • Speaking and Listening (SL): Anchor Standard SL.1; SL.3.4; SL.5.5 • Language (L): Anchor Standard L.4 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Measurement & Data (MD): 3.MD.B.3; 5.MD.B.2 • Geometry (G): 5.G.A.2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Health Education</p> <ul style="list-style-type: none"> • Substance Abuse Prevention: 1b.4.6 • Analyzing Influences: 2.E2.c

GRADE BAND: Grades 6-8

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Human impacts are cumulative and can develop over time into environmental problems which can interact on a local or global scale to affect the Earth’s systems and sustainability. Changes in human behavior at local levels can minimize, mitigate, and often remediate human impact.</p>	<p>By the end of grade 8, students will:</p> <ul style="list-style-type: none"> A. Explain how human activities alter the balance of Earth’s systems and the environment over time. B. Define and apply the concept of sustainability to the environmental impact of human activity. C. Analyze the local and global costs and benefits of meeting human needs with respect to their environmental impact. D. Construct an explanation or model of the global impacts of local environmental issues. E. Explain how changes in human behavior can minimize or mitigate human impact on the environment. 	<ul style="list-style-type: none"> • How does the cumulation of human activities impact the environment over time? • How can we distinguish between sustainable and unsustainable human activity? • What are the economic, social, and environmental impacts of human activities on the environment? • What changes in human behavior are needed to reduce or mitigate the impact on the environment? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): MS-ESS2-1; MS-ESS2-2; MS-ESS2-6; MS-ESS3-1; MS-ESS3-3; MS-ESS3-4; MS-ESS3-5 • Life Science (LS): MS-LS1-5; MS-LS2-1; MS-LS2-2; MS-LS2-4; MS-LS2-5; MS-LS4-5; MS-LS4-6 • Physical Science (PS): MS-PS1-3 • Engineering, Technology, and the Application of Science (ETS): MS-ETS1-1; MS-ETS1-2; MS-ETS1-3; MS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • Grades 6 and 7, Revised frameworks to be released in 2023. <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.6-8.1; WHST.6-8.2; WHST.6-8.7; WHST.6-8.8; WHST.6-8.9 • Reading Informational Texts (RI): RI.8.8 • Reading in Science & Technical Subjects (RST): RST.6-8.1; RST.6-8.7; RST.6-8.8 • Speaking and Listening (SL): SL.8.1; SL.8.4

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.4 • Ratio & Proportional Relationships (RP): 6.RP.A.1; 6.RP.A.3; 7.RP.A.2 • Expression & Equations (EE): 6.EE.B.6; 7.EE.B.4 <p>Health Education</p> <ul style="list-style-type: none"> • Substance Abuse Prevention: 1b.8.5 • Disease Prevention and Control: 1f.7.1

GRADE BAND: Grades 9-12

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Human population growth will continue to increase the stress on the environment and natural resources, which may affect the ability to provide essential services such as clean water and breathable air. Sustainable methods must be developed to meet human needs and protect the integrity of Earth’s resources.</p>	<p>By the end of grade 12, students will:</p> <ul style="list-style-type: none"> A. Evaluate the short-term and long-term environmental consequences of human choices. B. Compare alternative points of view on environmental issues and how these points of view arise from experience, and culture. C. Explain how human society depends on developing sustainable practices that preserve the natural world. D. Illustrate how sustainable practices create a society that can be maintained without causing further harm to the environment. 	<ul style="list-style-type: none"> • What are the short-term and long-term consequences of human population growth on the environment? • How do different sustainability practices address environmental problems and support societal needs? • How and why do the perspectives of individuals and groups related to environmental issues differ? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): HS-ESS2-2; HS-ESS2-4; HS-ESS2-5; HS-ESS3-1; HS-ESS3-2; HS-ESS3-3; HS-ESS3-4; HS-ESS3-5; HS-ESS3-6 • Life Science (LS): HS-LS2-1; HS-LS2-2; HS-LS2-6; HS-LS2-7; HS-LS2-8; HS-LS3-2; HS-LS4-5; HS-LS4-6 • Engineering, Technology, and the Application of Science (ETS): HS-ETS1-1; HS-ETS1-2; HS-ETS1-3; HS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • High School American Government, Unit: Domestic Policy, Unit: Executive Branch, Unit: Economics, Standard 6.0 • Modern World History (1970 – Present), Unit: Globalization, Standard 6.0 • High School United States History, Unit: Economic, Political, and Social Reorganization (1974-1992), Unit: Globalization, Terrorism, and Political Polarization (1992- Present), Standard 6.0

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.9-10.1; W.9-10.2 • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.9-12.2; WHST.9-12.5; WHST.9-12.7 • Reading Informational Texts (RI): RI.9-10.1; RI.9-10.2 • Reading in Science & Technical Subjects (RST): RST.9-10.7; RST.9-10.8; RST.9-10.9; RST.11-2.1; RST.11-12.7; RST.11-12.8 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Interpreting Categorical & Quantitative Data (ID): HSS.ID.A.1 • Making Inferences & Justifying Conclusions (IC): HSS.IC.A.1; HSS.IC.B.6 • Quantities (Q): HSN.Q.A.1; HSN.Q.A.2; HSN.Q.A.3 <p>Health Education</p> <ul style="list-style-type: none"> • Substance Abuse Prevention: 1b.HS2.11

Standard 4: Consequences of Environmental Change on Human Health and Well-Being

Environmentally literate students construct and apply understanding of the consequences of human-induced environmental change on individual and collective health and well-being.

GRADE BAND: PreK-Grade 2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Human actions can hurt the environment but where we live may have an impact on how much or how little we are affected by environmental issues.</p>	<p>By the end of grade 2, students will:</p> <ul style="list-style-type: none"> A. Explain the impact of human changes on the environment. B. Identify environmental issues caused by humans in different geographic areas (urban/suburban, rural). C. Identify how where we live might affect the impact of an environmental issue. 	<ul style="list-style-type: none"> • What are some possible consequences of human-induced environmental change? • How are the consequences of environmental issues different in various local environments or communities? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): K-ESS2-2; K-ESS3-1; K-ESS3-3; 2-ESS2-1 • Life Science (LS): K-LS1-1; 2-LS2-1; 2-LS4-1 <p>Social Studies</p> <ul style="list-style-type: none"> • PreK, Unit 2 Geography, Standard 6.0 • K, Unit 2: Geography, Standard 6.0 • Grade 1, Unit 2 Geography, Standard 6.0 • Grade 2, Unit 2 Geography, Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.2.1; W.2.2; W.2.3; W.2.5; W.2.6; W.2.8 • Reading Informational Texts (RI): RI.2.1; RI.2.2; RI.2.3; RI.2.4; RI.2.5; RI.2.6; RI.2.7; RI.2.8 • Reading (R): Anchor Standard R.1 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4; MP.5

GRADE BAND: Grades 3-5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Human health and well-being are impacted by environmental changes that can cause inequities in human health and resource distribution.</p>	<p>By the end of grade 5, students will:</p> <p>A. Identify the consequences of human-caused environmental issues on human health.</p> <p>B. Determine how human-caused environmental change can affect people’s mental and physical well-being.</p> <p>C. Investigate inequities in human health and resource distribution caused by human-caused environmental changes.</p>	<ul style="list-style-type: none"> • How do human-induced environmental changes affect the mental and physical health of humans? • How can we identify and evaluate the impact of environmental change on mental and physical well-being? • How does human-induced environmental change lead to inequities in human health and resource distribution? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): 3-ESS2-2; 4-ESS3-1; 5-ESS2-1; 5-ESS3-1 • Life Science (LS): 3-LS4-3; 3-LS4-4; 5-LS2-1 <p>Social Studies</p> <ul style="list-style-type: none"> • Grade 3, Unit 2: Economics and Geography, Standard 6.0 • Grade 4, Unit 1: Worlds Collide (1450 – 1650), Standard 6.0 • Grade 5, Unit 3: The Challenges of American Economic, Political, and Civic Life (1900 – Today), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): Anchor Standard W.7; W.3.1; W.3.2; W4.7; W.5.8; W.5.9 • Reading Informational Texts (RI): Anchor Standard RI.3; Anchor Standard RI.9; RI.3.1; RI.3.2; RI.3.3; RI.5.1; RI.5.7; RI.5.9 • Speaking and Listening (SL): Anchor Standard SL.1; SL.3.4; SL.5.5 • Language (L): Anchor Standard L.4

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Measurement & Data (MD): 3.MD.B.3; 5.MD.B.2 • Geometry (G): 5.G.A.2 <p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.5.1 • Healthy Eating: 1e.5.3 • Analyzing Influences: 2.E2.c; 2.E2.d • Decision-Making: 5.E2.a • Advocacy: 8.E2.a

GRADE BAND: Grades 6-8

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Humans can measure and control environmental impacts, through laws and policies, but some communities' human health is more impacted than others.</p>	<p>By the end of grade 8, students will:</p> <p>A. Analyze the implications of human-induced environmental issues on human health.</p> <p>B. Examine how physical engagement with the natural environment contributes to the well-being of individuals and societies.</p> <p>C. Identify the social and cultural issues associated with human-induced environmental changes that cause inequities in resource distribution, human health, and well-being.</p> <p>D. Evaluate the need for actions associated with environmental justice.</p>	<ul style="list-style-type: none"> • How do human-induced environmental changes affect the mental and physical health of individuals and communities? • How do decisions made at one point in time impact later generations' health and well-being? • How can inequities in resources, human health, and well-being be addressed when developing environmental solutions? • How can we ensure the fair treatment of all people related to environmental issues? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): MS-ESS2-1; MS-ESS2-6; MS-ESS3-1; MS-ESS3-3; MS-ESS3-4; MS-ESS3-5 • Life Science (LS): MS-LS1-5; MS-LS2-1; MS-LS2-2; MS-LS2-4; MS-LS2-5; MS-LS4-5; MS-LS4-6 • Physical Science (PS): MS-PS1-3 <p>Social Studies</p> <ul style="list-style-type: none"> • Grades 6 and 7, Revised frameworks to be released in 2023 • Middle School United States History Grade 8, Unit: Colonization (1607-1754), Unit: Growth of Industrial America (1877-1890), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.6-8.1; WHST.6-8.2; WHST.6-8.7; WHST.6-8.8; WHST.6-8.9 • Reading Informational Texts (RI): RI.8.8 • Reading in Science & Technical Subjects (RST): RST.6-8.1; RST.6-8.7; RST.6-8.8 • Speaking and Listening (SL): SL.8.1; SL.8.4

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.4 • Ratio & Proportional Relationships (RP): 6.RP.A.1; 6.RP.A.3; 7.RP.A.2 • Expression & Equations (EE): 6.EE.B.6; 7.EE.B.4 <p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.6.1; 1a.7.2; 1a.8.2 • Disease Prevention and Control: 1f.7.1

GRADE BAND: Grades 9-12

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Human-induced environmental changes are leading to human health problems in many communities which have far-reaching consequences for society.</p>	<p>By the end of grade 12, students will:</p> <ul style="list-style-type: none"> A. Analyze how the environment contributes to human health and well-being. B. Identify populations that are most vulnerable to environmental changes. C. Discuss the burden of environmental pollution as experienced by developed and developing nations. D. Describe how environmental injustice and inequality contribute to environmental health disparities across populations of differing ethnicity, race, and socioeconomic status. 	<ul style="list-style-type: none"> • How does a healthy environment contribute to the mental and physical health of individuals and communities? • How do policies and practices promote pollution and environmental degradation in developing nations? • Why are communities of color and communities impacted by poverty disproportionately impacted by environmental health hazards? • How can human exposure to environmental health hazards be corrected or limited? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): HS-ESS2-2; HS-ESS2-4; HS-ESS2-5; HS-ESS3-1; HS-ESS3-2; HS-ESS3-3; HS-ESS3-4; HS-ESS3-5; HS-ESS3-6 • Life Science (LS): HS-LS2-1; HS-LS2-2; HS-LS2-6; HS-LS2-7; HS-LS2-8; HS-LS4-5; HS-LS4-6 • Engineering, Technology, and the Application of Science (ETS): HS-ETS1-1; HS-ETS1-2; HS-ETS1-3; HS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • High School American Government, Unit: Domestic Policy, Unit: Executive Branch, Unit: Economics, Standard 6.0 • Modern World History (1970 – Present), Unit: Globalization, Standard 6.0 • High School United States History, Unit: Economic, Political, and Social Reorganization (1974-1992), Unit: Globalization, Terrorism, and Political Polarization (1992- Present), Standard 6.0

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
	<p>E. Explore preventative behaviors and corrective measures to limit exposure to environmental health hazards.</p>		<p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.9-10.1; W.9-10.2 • Reading Informational Texts (RI): RI.9-10.1; RI.9-10.2 • Reading in Science & Technical Subjects (RST): RST.9-10.7; RST.9-10.8; RST.9-10.9; RST.11-12.1; RST.11-12.7; RST.11-12.8 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2 • Interpreting Categorical & Quantitative Data (ID): HSS.ID.A.1 • Making Inferences & Justifying Conclusions (IC): HSS.IC.A.1; HSS.IC.B.6 <p>Health Education</p> <ul style="list-style-type: none"> • Mental and Emotional Health: 1a.HS1.2; 1a.HS1.4; 1a.HS2.2; 1a.HS2.5 • Healthy Eating: 1e.HS2.6 • Disease Prevention and Control: 1f.HS1.8; 1f.HS2.9 • Analyzing Influences: 2.HS.d

Standard 5: Individual and Collective Responses to Environmental Change

Environmentally literate students construct and apply understanding of individual, collective, and societal responses to human-induced environmental change.

GRADE BAND: PreK-Grade2

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Everyone has a responsibility (civic duty) to protect the environment by taking positive action as individuals and as a community.</p>	<p>By the end of grade 2, students will:</p> <ul style="list-style-type: none"> A. Generate examples of individuals or groups that protect the environment. B. Identify actions that may solve environmental problems caused by humans. C. Identify individual role and responsibility as it relates to taking positive local actions. 	<ul style="list-style-type: none"> • What are our roles and responsibilities in caring for our planet? • What positive actions can we take to protect people and the environment? • In what ways can an individual’s local actions impact human-induced environmental changes? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): K-ESS2-2; K-ESS3-1; K-ESS3-3; 2-ESS2-1 • Life Science (LS): K-LS1-1; 2-LS2-1; 2-LS4-1 <p>Social Studies</p> <ul style="list-style-type: none"> • PreK, Unit 2 Geography, Standard 6.0 • K, Unit 2: Geography, Standard 6.0 • Grade 1, Unit 2 Geography, Standard 6.0 • Grade 2, Unit 2 Geography, Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): W.2.1; W2.2; W2.3; W.2.5; W.2.6; W.2.8 • Reading Informational Texts (RI): RI.K.1; RI.2.1; RI.2.2; RI.2.3; RI.2.4; RI.2.5; RI.2.6; RI2.7; RI.2.8 • Reading (R): Anchor Standard R.1 <p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4; MP.5

GRADE BAND: Grades 3-5

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Individuals, communities, and government agencies can take action to respond to human-induced environmental change by creating policies and laws to encourage sustainable behaviors.</p>	<p>By the end of grade 5, students will:</p> <ul style="list-style-type: none"> A. Identify individual actions that encourage sustainable behaviors. B. Analyze how communities and government agencies impact the environment. C. Investigate past or current environmental policies or laws to determine their impact on people and the environment. D. Evaluate the effectiveness of environmental policies or laws in changing individual and community behaviors. 	<ul style="list-style-type: none"> • What role do policies and laws play in protecting the environment? • Why might individuals choose impact-reducing behaviors while others may not? • How effective are policies and laws in changing individual and community behaviors? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): 4-ESS3-1; 5-ESS2-1; 5-ESS3-1 • Life Science (LS): 3-LS4-3; 3-LS4-4 <p>Social Studies</p> <ul style="list-style-type: none"> • Grade 3, Unit 2: Economics and Geography, Standard 6.0 • Grade 4, Unit 1: Worlds Collide (1450 – 1650), Standard 6.0 • Grade 5, Unit 3: The Challenges of American Economic, Political, and Civic Life (1900 – Today), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing (W): Anchor Standard W.7; W.3.1; W.3.2; W.5.8; W.5.9 • Reading Informational Texts (RI): Anchor Standard RI.6; Anchor Standard RI.9; RI.3.1; RI.3.2; RI.3.3; RI.5.1; RI.5.7; RI.5.9 • Speaking and Listening (SL): Anchor Standard SL.1; Anchor Standard W.4; SL.3.4; SL.5.5 • Language (L): Anchor Standard L.4

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
			<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.2; MP.4 • Measurement & Data (MD): 3.MD.B.3; 5.MD.B.2 • Geometry (G): 5.G.A.2 <p>Health</p> <ul style="list-style-type: none"> • Analyzing Influences: 2.E2.b; 2.E2.c; 2.E2.d • Decision-Making: 5.E2.a

GRADE BAND: Grades 6-8

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>All actions by individuals, society, and governments impact the environment, often affecting groups unequally and creating persistent environmental justice issues in local communities.</p>	<p>By the end of grade 8, students will:</p> <ul style="list-style-type: none"> A. Determine if my personal actions have a positive or negative impact on environmental change. B. Identify current environmental justice issues created by policies and laws. C. Debate the impact of environmental policies and laws related to their level of protection and involvement for all people. D. Evaluate several types of environmental action strategies and their effect on marginalized groups of people. 	<ul style="list-style-type: none"> • In what ways do my personal actions impact the environment? • Why are some environmental issues controversial, and how might this affect approaches to addressing them? • In what ways do environmental justice issues exist in the local community? • What is the relationship between environmental issues and civil rights? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): MS-ESS2-1; MS-ESS2-6; MS-ESS3-1; MS-ESS3-3; MS-ESS3-4; MS-ESS3-5 • Life Science (LS): MS-LS1-5; MS-LS2-1; MS-LS2-2; MS-LS2-4; MS-LS2-5; MS-LS4-5; MS-LS4-6 • Physical Science (PS): MS-PS1-3 • Engineering, Technology, and the Application of Science (ETS): MS-ETS1-1; MS-ETS1-2; MS-ETS1-3; MS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • Grades 6 and 7, Revised frameworks to be released in 2023 • Middle School United States History Grade 8, Unit: Colonization (1607-1754), Unit: Growth of Industrial America (1877-1890), Standard 6.0 <p>ELA/Literacy</p> <ul style="list-style-type: none"> • Writing in History/Social Studies, Science, & Technical Subjects (WHST): WHST.6-8.1; WHST.6-8.2; WHST.6-8.7; WHST.6-8.8; WHST.6-8.9 • Reading Informational Texts (RI): RI.8.8 • Reading in Science & Technical Subjects (RST): RST.6-8.1; RST.6-8.7; RST.6-8.8 • Speaking and Listening (SL): SL.8.1; SL.8.4

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
	<p>E. Research careers related to the environment and how these careers respond to human-induced environmental change.</p>		<p>Mathematics</p> <ul style="list-style-type: none"> • Mathematical Practices (MP): MP.4 • Ratio & Proportional Relationships (RP): 6.RP.A.1; 6.RP.A.3; 7.RP.A.2 • Expression & Equations (EE): 6.EE.B.6; 7.EE.B.4 <p>Health Education</p> <ul style="list-style-type: none"> • Safety and Violence Prevention: 1d.7.9; 1d.8.17 • Advocacy: 8.MS.a; 8.MS.b; 8.MS.c; 8.MS.d

GRADE BAND: Grades 9-12

ENDURING UNDERSTANDING	OBJECTIVE STATEMENTS	ESSENTIAL QUESTIONS	CONTENT STANDARDS
<p>Any effective response to environmental change requires individual and collective action and must recognize the disproportionate burden that environmental degradation places on communities of color, low socioeconomic status, and ethnic minorities as well as on developing countries.</p>	<p>By the end of grade 12, students will:</p> <p>A. Explain that both individual and collective action is needed to address environmental problems.</p> <p>B. Evaluate the effectiveness of various individual, collective, and societal responses to human-induced environmental change.</p> <p>C. Identify actions to reduce the effect of environmental degradation on communities of color, low socioeconomic status, and ethnic minorities.</p> <p>D. Evaluate current approaches to address environmental change to include diverse points of view and more effective and just strategies.</p> <p>E. Research global efforts to implement environmental policies in developing countries.</p>	<ul style="list-style-type: none"> • How do societal norms influence our response to environmental change? • What strategies could be implemented by individuals and by communities to reduce their ecological footprint and/or address issues of environmental justice and environmental racism? • How do current policies and laws address environmental justice and environmental racism? • How can environmental justice mitigate and prevent environmental racism? 	<p>Science</p> <ul style="list-style-type: none"> • Earth/Space Science (ESS): HS-ESS2-2; HS-ESS2-4; HS-ESS2-5; HS-ESS3-1; HS-ESS3-2; HS-ESS3-3; HS-ESS3-4; HS-ESS3-5; HS-ESS3-6 • Life Science (LS): HS-LS2-1; HS-LS2-2; HS-LS2-7; HS-LS4-5; HS-LS4-6 • Engineering, Technology, and the Application of Science (ETS): HS-ETS1-1; HS-ETS1-2; HS-ETS1-3; HS-ETS1-4 <p>Social Studies</p> <ul style="list-style-type: none"> • High School American Government, Unit: Domestic Policy, Unit: Executive Branch, Unit: Economics, Standard 6.0 • Modern World History (1970 – Present), Unit: Globalization, Standard 6.0 • High School United States History, Unit: Economic, Political, and Social Reorganization (1974-1992), Unit: Globalization, Terrorism, and Political Polarization (1992- Present), Standard 6.0

Standard 4: Environmentally literate students construct and apply understanding of the consequences of human-induced environmental change on individual and collective health and well-being.

BY THE END OF GRADE 2, STUDENTS WILL:	BY THE END OF GRADE 5, STUDENTS WILL:	BY THE END OF GRADE 8, STUDENTS WILL:	BY THE END OF GRADE 12, STUDENTS WILL:
<p>A. Explain the impact of human changes on the environment.</p> <p>B. Identify environmental issues caused by humans in different geographic areas (urban/suburban, rural).</p> <p>C. Identify how where we live might affect the impact of an environmental issue.</p>	<p>A. Identify the consequences of human-caused environmental issues on human health.</p> <p>B. Determine how human-caused environmental change can affect people’s mental and physical well-being.</p> <p>C. Investigate inequities in human health and resource distribution caused by human-caused environmental changes.</p>	<p>A. Analyze the implications of human-induced environmental issues on human health.</p> <p>B. Examine how physical engagement with the natural environment contributes to the well-being of individuals and societies.</p> <p>C. Identify the social and cultural issues associated with human-induced environmental changes that cause inequities in resource distribution, human health, and well-being.</p> <p>D. Evaluate the need for actions associated with environmental justice.</p>	<p>A. Analyze the implications of how environmental factors contribute to human health and well-being.</p> <p>B. Identify populations that are most vulnerable to environmental changes.</p> <p>C. Discuss the burden of environmental pollution as experienced by developed and developing nations.</p> <p>D. Describe how environmental injustice and inequality contribute to environmental health disparities across populations of differing ethnicity, race, and socioeconomic status.</p> <p>E. Explore preventative behaviors and corrective measures to limit exposure to environmental health hazards.</p>

Standard 5: Environmentally literate students construct and apply understanding of individual, collective, and societal responses to human-induced environmental change.

BY THE END OF GRADE 2, STUDENTS WILL:	BY THE END OF GRADE 5, STUDENTS WILL:	BY THE END OF GRADE 8, STUDENTS WILL:	BY THE END OF GRADE 12, STUDENTS WILL:
<ul style="list-style-type: none"> A. Generate examples of individuals or groups that protect the environment. B. Identify actions that may solve environmental problems caused by humans. C. Identify individual role and responsibility as it relates to taking positive local actions. 	<ul style="list-style-type: none"> A. Identify individual actions that encourage sustainable behaviors. B. Analyze how communities and government agencies impact the environment. C. Investigate past or current environmental policies or laws to determine their impact on people and the environment. D. Evaluate the effectiveness of environmental policies or laws in changing individual and community behaviors. 	<ul style="list-style-type: none"> A. Determine if my personal actions have a positive or negative impact on environmental change. B. Identify current environmental justice issues created by policies and laws. C. Debate the impact of environmental policies and laws related to their level of protection and involvement for all people. D. Evaluate several types of environmental action strategies and their effect on marginalized groups of people. E. Research careers related to the environment and how these careers respond to human-induced environmental change. 	<ul style="list-style-type: none"> A. Explain that both individual and collective action is needed to address environmental problems. B. Evaluate the effectiveness of various individual, collective, and societal responses to human-induced environmental change. C. Identify actions to reduce the effect of environmental degradation on communities of color, low socioeconomic status, and ethnic minorities. D. Evaluate current approaches to address environmental change to include diverse points of view and more effective and just strategies. E. Research global efforts to implement environmental policies in developing countries.

Essential Questions:

Standard 1: Environmentally literate students investigate environmental issues in order to develop and implement local actions that protect, sustain, or restore the natural environment.

PREK-GRADE 2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<ul style="list-style-type: none"> • What are our responsibilities toward protecting the environment? • How can we identify local environmental issues, and develop a plan of action to address the issue? • How can we identify needed resources and communicate to others about our planned actions aimed at addressing a local environmental issue? 	<ul style="list-style-type: none"> • How can we identify, research, and take local action to protect, sustain or restore the natural environment? • How can we gather evidence to generate solutions related to a local environmental issue? • How can we evaluate the impact of our action plan? 	<ul style="list-style-type: none"> • How can we identify, evaluate, and take local action to protect, sustain or restore the natural environment? • How do local or global environmental issues impact various stakeholder groups? • How can we evaluate our individual and group actions' short- and long-term consequences? • How can we identify and consider the needs and priorities of various stakeholders concerning our selected actions? 	<ul style="list-style-type: none"> • How can we monitor our environment's health and make evidence-based decisions to inform our actions? • How do cultural, social, and economic factors influence decisions regarding actions to mitigate the effects of human activity on the environment? • How can we examine, implement, evaluate, and critique an action plan to protect, sustain or restore the natural environment while engaging diverse stakeholders?

Standard 2: Environmentally literate students construct and apply understanding of how Earth’s systems and natural resources support human existence.

PREK-GRADE 2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<ul style="list-style-type: none"> • How is the environment vital to human survival? • How does the environment influence human activities? 	<ul style="list-style-type: none"> • How do Maryland's natural systems and resources impact human survival, conduct, and recreational activities? • How does the local environment influence human activity and local culture? • How has human dependence on the local environment changed over time and across various populations? 	<ul style="list-style-type: none"> • How do life and humans depend on Earth’s resources? • How do natural resources and their distribution impact human society and culture? • How do cultural and societal views impact environmental decisions? 	<ul style="list-style-type: none"> • How does a healthy ecosystem relate to human physical, emotional, and psychological health and well-being? • How does the development of sustainable practices in modern civilization around natural resources maintain healthy ecosystems? • How does technology contribute to humans altering natural systems to meet their needs? • How does the experience of biodiversity contribute to the development of a sense of place?

Standard 3: Environmentally literate students construct and apply understanding of the environmental impact of human activities on Earth’s systems and resources.

PREK-GRADE 2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<ul style="list-style-type: none"> • How do humans alter their environment to meet their wants and needs? • What are some possible impacts of human alteration on the environment? • How can we reduce the impact of human activity on the environment as the human population grows? 	<ul style="list-style-type: none"> • How do various human activities impact the environment at different levels? • How can we meet human needs but also limit our impact on the environment? • What are some choices humans can make to have a positive environmental impact? 	<ul style="list-style-type: none"> • How does the cumulation of human activities impact the environment over time? • How can we distinguish between sustainable and unsustainable human activity? • What are the economic, social, and environmental impacts of human activities on the environment? • What changes in human behavior are needed to reduce or mitigate the impact on the environment? 	<ul style="list-style-type: none"> • What are the short-term and long-term consequences of human population growth on the environment? • How do different sustainability practices address environmental problems and support societal needs? • How and why do the perspectives of individuals and groups related to environmental issues differ?

Standard 4: Environmentally literate students construct and apply understanding of the consequences of human-induced environmental change on individual and collective health and well-being.

PREK-GRADE 2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<ul style="list-style-type: none"> • What are some possible consequences of human-induced environmental change? • How are the consequences of environmental issues different in various local environments or communities? 	<ul style="list-style-type: none"> • How do human-induced environmental changes affect the mental and physical health of humans? • How can we identify and evaluate the impact of environmental change on mental and physical well-being? • How does human-induced environmental change lead to inequities in human health and resource distribution? 	<ul style="list-style-type: none"> • How do human-induced environmental changes affect the mental and physical health of individuals and communities? • How do decisions made at one point in time impact later generations’ health and well-being? • How can inequities in resources, human health, and well-being be addressed when developing environmental solutions? • How can we ensure the fair treatment of all people related to environmental issues? 	<ul style="list-style-type: none"> • How does a healthy environment contribute to the mental and physical health of individuals and communities? • How do policies and practices promote pollution and environmental degradation in developing nations? • Why are communities of color and communities impacted by poverty disproportionately impacted by environmental health hazards? • How can human exposure to environmental health hazards be corrected or limited?

Standard 5: Environmentally literate students construct and apply understanding of individual, collective, and societal responses to human-induced environmental change.

PREK-GRADE 2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<ul style="list-style-type: none"> • What are our roles and responsibilities in caring for our planet? • What positive actions can we take to protect people and the environment? • In what ways can an individual’s local actions impact human-induced environmental changes? 	<ul style="list-style-type: none"> • What role do policies and laws play in protecting the environment? • Why might individuals choose impact-reducing behaviors while others may not? • How effective are policies and laws in changing individual and community behaviors? 	<ul style="list-style-type: none"> • In what ways do my personal actions impact the environment? • Why are some environmental issues controversial, and how might this affect approaches to addressing them? • In what ways do environmental justice issues exist in the local community? • What is the relationship between environmental issues and civil rights? 	<ul style="list-style-type: none"> • How do societal norms influence our response to environmental change? • What strategies could be implemented by individuals and by communities to reduce their ecological footprint and/or address issues of environmental justice and environmental racism? • How do current policies and laws address environmental justice and environmental racism? • How can environmental justice mitigate and prevent environmental racism?

Appendix B – Phenomena for Environmental Literacy

If the learner is to be an active participant in environmental literacy so that it becomes a natural and valued part of their life, the instruction should be guided by the learner’s interests and treated as a process of building knowledge and skills appropriate for their developmental level. All learners’ needs, cultures, and backgrounds should be considered to ensure that environmental literacy instruction is equitable, inclusive, and relevant. Instructional sequences are more coherent and engaging when learners investigate compelling natural phenomena or environmental issues in their local environment.

Elementary Phenomena

Standard 1: Environmentally literate students investigate environmental issues in order to develop and implement local actions that protect, sustain, or restore the natural environment.

- [The Trashwheel Family](#) (Website, Grades PreK-5)
- [Biological Weathering](#) (Website, Grade K)
- [Woodpecker Homes](#) (Website, Grade K)
- [Dolphins and Humans Fishing Together](#) (Website, Grade K)
- [Exploring Microhabitats](#) (Website, Grade K)
- [Precious Plastic](#) (Website, Grade K)
- [Google Maps Timelapse](#) (Website, Grade K)
- [Alligators Survive in Ice](#) (Website, Grade K)
- [Plant Your Socks](#) (Website, Grade K-2)
- [Crown Shyness](#) (Website, Grade K-2)
- [Corn Cob Sprouting in Water](#) (Website, Grade K-2)
- [Desert Beetle Harvests Water](#) (Website, Grade K-3)
- [12 Years in a Sealed Ecosystem](#) (Website, Grade K-5)
- [Air Plants - No Soil Needed](#) (Website, Grade K-5)
- [Biosphere 2](#) (Website, Grade K-5)
- [Farming Fish with Vegetables](#) (website, Grade K-5)
- [Why Do Sunflowers Follow the Sun?](#) (Website, Grade K-5)
- [Fighting Floods](#) (Video, Grades 2-5)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 3)
- [The Salmon Cannon](#) (Website, Grade 3)
- [The Asteroid That Killed the Dinosaurs](#) (Website, Grade 3)
- [Algae Fuel and Food](#) (Website, Grade 4-5)
- [Vegetable Oil as Fuel](#) (Website, Grade 4-5)
- [NatGeo: Food Waste](#) (Infographic, Grade 5)
- [NatGeo: Saving Unique Habitats](#) (Infographic, Grade 5)
- [50 Year old Sealed Ecosystem](#) (Website, Grade 5)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 5)
- [Augmented Reality Sandbox](#) (Website, Grade 5)
- [The Mystery of the Missing Bees](#) (Website, Grade 5)
- [Why Do Rivers Curve?](#) (Website, Grade 5)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 5)
- [Towing an Iceberg to the UAE](#) (Website, Grade 5)

Standard 2: Environmentally literate students construct and apply understanding of how Earth’s systems and natural resources support human existence.

- [The Mystery of Missing Bees](#) (Video, Grades PreK-5)
- [Biological Weathering](#) (Website, Grade K)
- [Woodpecker Homes](#) (Website, Grade K)
- [Precious Plastic](#) (Website, Grade K)
- [Dolphins and Humans Fishing Together](#) (Website, Grade K)
- [Alligators Survive in Ice](#) (Website, Grade K)
- [Crown Shyness](#) (Website, Grade K-2)
- [Corn Cob Sprouting in Water](#) (Website, Grade K-2)
- [Exploring Microhabitats](#) (Website, Grade K-2)
- [Desert Beetle Harvests Water](#) (Website, Grade K-3)
- [Biosphere 2](#) (Website, Grade K-5)
- [Farming Fish with Vegetables](#) (website, Grade K-5)
- [12 Years in a Sealed Ecosphere](#) (Website, Grade K-5)
- [Why Do Sunflowers Follow the Sun?](#) (Website, Grade K-5)
- [Plant Your Socks](#) (Website, Grade 2)
- [Air Plants - No Soil Needed](#) (Website, Grade 2)
- [Glacier National Park is Melting Away](#) (Website, Grade 2-5)
- [Towing an Iceberg to the UAE](#) (Website, Grade 2-5)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 2-5)
- [Why Do Rivers Curve?](#) (Website, Grade 2-5)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 2-5)
- [The Mystery of the Missing Bees](#) (Website, Grade 2-5)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 3)
- [The Salmon Cannon](#) (Website, Grade 3)
- [UAE Building a Mountain to Increase Rainfall](#) (Website, Grade 3)
- [Why Does the Wind Blow?](#) (Website, Grade 3)
- [NatGeo: Do We Treat Our Soil Like Dirt?](#) (Article, Grades 3-5)
- [Algae Fuel and Food](#) (Video, Grade 4-5)
- [Vegetable Oil as Fuel](#) (Website, Grade 4-5)
- [50 Year old Sealed Ecosphere](#) (Website, Grade 5)
- [Attack of the Killer Fungi](#) (Website, Grade 5)
- [How to Make a Cloud in Your Mouth](#) (Website, Grade 5)

Standard 3: Environmentally literate students construct and apply understanding of the environmental impact of human activities on Earth’s systems and resources.

- [Collection of Glacier Photographs](#) (Interactive Slideshow, Grades PreK-5)
- [Biological Weathering](#) (Website, Grade K)
- [Woodpecker Homes](#) (Website, Grade K)
- [Precious Plastic](#) (Website, Grade K)
- [Alligators Survive in Ice](#) (Website, Grade K)
- [Dolphins and Humans Fishing Together](#) (Website, Grade K)
- [Plant Your Socks](#) (Website, Grade K-2)
- [Crown Shyness](#) (Website, Grade K-2)
- [Corn Cob Sprouting in Water](#) (Website, Grade K-2)
- [Exploring Microhabitats](#) (Website, Grade K-3)
- [Desert Beetle Harvests Water](#) (Website, Grade K-3)
- [Biosphere 2](#) (Website, Grade K-5)
- [Farming Fish with Vegetables](#) (website, Grade K-5)
- [12 Years in a Sealed Ecosphere](#) (Website, Grade K-5)
- [Why Do Sunflowers Follow the Sun?](#) (Website, Grade K-5)
- [Oceans as Heat Absorbers Water Balloon Demonstration](#) (Video, Grades 2-5)

- [The Mystery of the Missing Bees](#) (Website, Grade 2-5)
- [Why Do Rivers Curve?](#) (Website, Grade 2-5)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 2-5)
- [Glacier National Park is Melting Away](#) (Website, Grade 2-5)
- [Towing an Iceberg to the UAE](#) (Website, Grade 2-5)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 2-5)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 3)
- [The Salmon Cannon](#) (Website, Grade 3)
- [The Asteroid That Killed the Dinosaurs](#) (Website, Grade 3)
- [NatGeo: Plastic Bag Found at the Bottom of World’s Deepest Ocean Trench](#) (Article, Grades 3-5)
- [Beef, Is It Still What’s For Dinner?](#) (Infographic, Grades 3-5)
- [Increasing Ocean temperatures](#) (Infographic, Grades 3-5)
- [Population Growth](#) (Video, Grades 3-5): Especially consider watching without sound
- [Albatros Can Die From Eating Plastic](#) (Project Resource, Grade 3)
- [Algae Fuel and Food](#) (Video, Grade 4)
- [Vegetable Oil as Fuel](#) (Website, Grade 4)
- [50 Year old Sealed Ecosphere](#) (Website, Grade 5)
- [Attack of the Killer Fungi](#) (Website, Grade 5)
- [Sea Otters Regulate the Kelp Forest Ecosystem](#) (Project Resources, Grade 5)
- [Epic Mudslide Caught on Camera](#) (Video, Grade 5)

Standard 4: Environmentally literate students construct and apply understanding of the consequences of human-induced environmental change on individual and collective health and well-being.

- [NatGeo: Sea Level, Climate Change, and the Chesapeake Bay](#) (Map, Grades PreK-5)
- [Biological Weathering](#) (Website, Grade K)
- [Woodpecker Homes](#) (Website, Grade K)
- [Precious Plastic](#) (Website, Grade K)
- [Alligators Survive in Ice](#) (Website, Grade K)
- [Dolphins and Humans Fishing Together](#) (Website, Grade K)
- [Plant Your Socks](#) (Website, Grade K-2)
- [Crown Shyness](#) (Website, Grade K-2)
- [Corn Cob Sprouting in Water](#) (Website, Grade K-2)
- [Desert Beetle Harvests Water](#) (Website, Grade K-3)
- [Exploring Microhabitats](#) (Website, Grade K-3)
- [Biosphere 2](#) (Website, Grade K-5)
- [Why Do Sunflowers Follow the Sun?](#) (Website, Grade K-5)
- [Air Plants - No Soil Needed](#) (Website, Grade 2-5)
- [Why Do Rivers Curve?](#) (Website, Grade 2-5)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 2-5)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 2-5)
- [Farming Fish with Vegetables](#) (website, Grade 2-5)
- [12 Years in a Sealed Ecosphere](#) (Website, Grade 2-5)
- [Water and Land Use](#) (Images/Maps, Grades 2-5)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 3)
- [The Asteroid That Killed the Dinosaurs](#) (Website, Grade 3)
- [The Salmon Cannon](#) (Website, Grade 3)
- [UAE Building a Mountain to Increase Rainfall](#) (Website, Grade 3)
- [Why Does the Wind Blow?](#) (Website, Grade 3)
- [The Driest Place on Earth](#) (Website, Grade 3)
- [Bay 101: Osprey](#) (Video, Grades 3-5)
- [Algae Fuel and Food](#) (Video, Grade 4)
- [Vegetable Oil as Fuel](#) (Website, Grade 4)
- [50 Year old Sealed Ecosphere](#) (Website, Grade 5)
- [Attack of the Killer Fungi](#) (Website, Grade 5)

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- [Towing an Iceberg to the UAE](#) (Website, Grade 5)
 - [The Mystery of the Missing Bees](#) (Website, Grade 5)
 - [How to Make a Cloud in Your Mouth](#) (Website, Grade 5)
 - [NatGeo: Landfills](#) (Encyclopedic Entry, Grade 5)
 - [NatGeo: Freshwater Access](#) (Encyclopedia Entry, Grade 5)

Standard 5: Environmentally literate students construct and apply understanding of individual, collective, and societal responses to human-induced environmental change.

- [Solar Cars](#) (Video or Activity, Grades PreK-5)
- [Biological Weathering](#) (Website, Grade K)
- [Woodpecker Homes](#) (Website, Grade K)
- [Precious Plastic](#) (Website, Grade K)
- [Alligators Survive in Ice](#) (Website, Grade K)
- [Dolphins and Humans Fishing Together](#) (Website, Grade K)
- [Plant Your Socks](#) (Website, Grade K-2)
- [Crown Shyness](#) (Website, Grade K-2)
- [Corn Cob Sprouting in Water](#) (Website, Grade K-2)
- [Desert Beetle Harvests Water](#) (Website, Grade K-3)
- [Exploring Microhabitats](#) (Website, Grade K-3)
- [Biosphere 2](#) (Website, Grade K-5)
- [Why Do Sunflowers Follow the Sun?](#) (Website, Grade K-3)
- [Farming Fish with Vegetables](#) (website, Grade 2-5)
- [12 Years in a Sealed Ecosystem](#) (Website, Grade 2-5)
- [Air Plants - No Soil Needed](#) (Website, Grade 2-5)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 2-5)
- [Why Do Rivers Curve?](#) (Website, Grade 2-5)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 2-5)
- [Fighting Floods](#) (Video, Grades 2-5)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 3)
- [The Asteroid That Killed the Dinosaurs](#) (Website, Grade 3)
- [The Salmon Cannon](#) (Website, Grade 3)
- [NatGeo: Get Outside with Citizen Science Projects](#) (Video, Grades 3-5)
- [Algae Fuel and Food](#) (Video, Grades 3-5)
- [John Smith Exploration and Impact](#) (Maps, Grade 4)
- [Algae Fuel and Food](#) (Video, Grade 4)
- [Vegetable Oil as Fuel](#) (Website, Grade 4)
- [Glacier National Park is Melting Away](#) (Website, Grade 5)
- [Towing an Iceberg to the UAE](#) (Website, Grade 5)
- [The Mystery of the Missing Bees](#) (Website, Grade 5)
- [How to Make a Cloud in Your Mouth](#) (Website, Grade 5)
- [NatGeo: Ocean Plastics](#) (Video, Grade 5)
- [NatGeo: Citizen Science](#) (Encyclopedic Entry, Grade 5)

Secondary Phenomena

Standard 1: Environmentally literate students investigate environmental issues in order to develop and implement local actions that protect, sustain, or restore the natural environment.

- [50 Year old Sealed Ecosphere](#) (Website, Grade 6-8)
- [12 Years in a Sealed Ecosphere](#) (Website, Grade 6-8)
- [Farming Fish with Vegetables](#) (Website, Grade 6-8)
- [Air Plants - No Soil Needed](#) (Website, Grade 6-8)
- [Attack of the Killer Fungi](#) (Website, Grade 6-8)
- [Biosphere 2](#) (Website, Grade 6-8)
- [Reconstructing Ancient Diets with Isotopes](#) (Website, Grade 6-8)
- [If We Are What We Eat, Americans Are Corn and Soy](#) (Website, Grade 6-8)
- [Natural Fish Lure | Lamprolure Mussel and Bass](#) (Website, Grade 6-8)
- [Ice Turns Himalayan Rabbits Black](#) (Website, Grade 6-8)
- [Corn Cob Sprouting in Water](#) (Website, Grade 6-8)
- [Towing an Iceberg to the UAE](#) (Website, Grade 6-8)
- [Indestructible Coating - Polyurea](#) (Website, Grade 6-8)
- [Aerogels - World's Lightest Solids](#) (Website, Grade 6-8)
- [Cleaning Dirty Water](#) (Project Resource, Grades 6-8)
- [CalMatters: Prepare students to lead on climate, environmental justice](#) (Commentary, Grades 6-12)
- [Greenpeace: Issues](#) (Webpage, Grades 6-12)
- [Bay101: Wetlands](#) (Video, Grades 6-12)
- [Why Do Humans Have Different Colored Skin?](#) (Website, Grade 6-12)
- [The Salmon Cannon](#) (Website, Grade 6-12)
- [Easter Island Deforestation](#) (Website, Grade 6-12)
- [Algae Fuel and Food](#) (Website, Grade 6-12)
- [The Great Oxygenation Event](#) (Website, Grade 6-12)
- [Vegetable Oil as Fuel](#) (Website, Grade 6-12)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 6-12)
- [Precious Plastic](#) (Website, Grade 6-12)
- [Glacier National Park is Melting Away](#) (Website, Grade 6-12)
- [The Dark Snow Project](#) (Website, Grade 6-12)
- [The Mystery of the Missing Bees](#) (Website, Grade 6-12)
- [UAE Building a Mountain to Increase Rainfall](#) (Website, Grade 6-12)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 9-12)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 9-12)
- [Terraforming Mars](#) (Website, Grade 9-12)
- [Ocean Acidification](#) (Website, Grade 9-12)

Standard 2: Environmentally literate students construct and apply understanding of how Earth’s systems and natural resources support human existence.

- [Fresh Air: 'Moby-Duck': When 28,800 Bath Toys Are Lost At Sea](#) (Article/Podcast, Grades 6-8)
- [Plastic Duckies Around the World](#) (Project Resource, Grades 6-8)
- [NatGeo: Freshwater Access](#) (Encyclopedia Entry, Grades 6-8)
- [EarthSky: Human and Natural Systems Are Coupled](#) (Audio Clip, Grades 6-12)
- [Green Earth](#) (GIF, Grades 6-12)
- [50 Year old Sealed Ecosphere](#) (Website, Grade 6-8)
- [12 Years in a Sealed Ecosphere](#) (Website, Grade 6-8)
- [Farming Fish with Vegetables](#) (Website, Grade 6-8)
- [Air Plants - No Soil Needed](#) (Website, Grade 6-8)
- [Biosphere 2](#) (Website, Grade 6-8)
- [Reconstructing Ancient Diets with Isotopes](#) (Website, Grade 6-8)
- [Ice Turns Himalayan Rabbits Black](#) (Website, Grade 6-8)
- [If We Are What We Eat, Americans Are Corn and Soy](#) (Website, Grade 6-8)
- [Natural Fish Lure | Lampsilis Mussel and Bass](#) (Website, Grade 6-8)
- [Indestructible Coating - Polyurea](#) (Website, Grade 6-8)
- [Aerogels - World’s Lightest Solids](#) (Website, Grade 6-8)
- [Earthships](#) (Website, Grade 6-12)
- [Attack of the Killer Fungi](#) (Website, Grade 6-12)
- [Towing an Iceberg to the UAE](#) (Website, Grade 6-12)
- [The Great Oxygenation Event](#) (Website, Grade 6-12)
- [Vegetable Oil as Fuel](#) (Website, Grade 6-12)
- [The Salmon Cannon](#) (Website, Grade 6-12)
- [Why Do Humans Have Different Colored Skin?](#) (Website, Grade 6-12)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 6-12)
- [UAE Building a Mountain to Increase Rainfall](#) (Website, Grade 6-12)
- [Easter Island Deforestation](#) (Website, Grade 6-12)
- [Algal Blooms and Marine Food Web](#) (Project Resource, Grade 7)
- [The Asteroid That Killed the Dinosaurs](#) (Website, Grade 9-12)
- [Terraforming Mars](#) (Website, Grade 9-12)
- [The Dark Snow Project](#) (Website, Grade 9-12)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 9-12)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 9-12)
- [Glacier National Park is Melting Away](#) (Website, Grade 9-12)
- [Ocean Acidification](#) (Website, Grade 9-12)
- [The Mystery of the Missing Bees](#) (Website, Grade 9-12)
- [Precious Plastic](#) (Website, Grade 9-12)

Standard 3: Environmentally literate students construct and apply understanding of the environmental impact of human activities on Earth’s systems and resources.

- [NatGeo: Climate Change](#) (Encyclopedia Entry, Grades 6-8)
- [Sometimes the Sun is Different Colors](#) (Project Resource, Grades 6-8)
- [Arctic Ice Melting](#) (Project Resource, Grades 6-8)
- [Biosphere 2](#) (Website, Grade 6-8)
- [Natural Fish Lure | Lampilis Mussel and Bass](#) (Website, Grade 6-8)
- [Ice Turns Himalayan Rabbits Black](#) (Website, Grade 6-8)
- [Yellowstone Supervolcano](#) (Website, Grade 6-8)
- [Why Does the Wind Blow?](#) (Website, 6-8)
- [The Driest Place on Earth](#) (Website, Grade 6-8)
- [Indestructible Coating - Polyurea](#) (Website, Grade 6-8)
- [Aerogels - World’s Lightest Solids](#) (Website, Grade 6-8)
- [Attack of the Killer Fungi](#) (Website, Grade 6-12)
- [The Great Oxygenation Event](#) (Website, Grade 6-12)
- [Galapagos Finch Evolution](#) (Website, Grade 6-12)
- [Algae Fuel and Food](#) (Website, Grade 6-12)
- [Vegetable Oil as Fuel](#) (Website, Grade 6-12)
- [The Salmon Cannon](#) (Website, Grade 6-12)
- [Corn Cob Sprouting in Water](#) (Website, Grade 6-12)
- [Earthships](#) (Website, Grade 6-12)
- [Why Do Humans Have Different Colored Skin?](#) (Website, Grade 6-12)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 6-12)
- [NatGeo: Sea Level, Climate Change, and the Chesapeake Bay](#) (Map, Grades 6-12)
- [NatGeo: 20% Of Our Oxygen Comes From Bacteria](#) (Video, Grades 6-12)
- [UAE Building a Mountain to Increase Rainfall](#) (Website, Grade 6-12)
- [Glacier National Park is Melting Away](#) (Website, Grade 6-12)
- [Precious Plastic](#) (Website, Grade 6-12)
- [The Dark Snow Project](#) (Website, Grade 6-12)
- [The Marianas Trench - Deepest Ocean](#) (Website, 6-12)
- [Towing an Iceberg to the UAE](#) (Website, Grade 6-12)
- [Parasitoid Wasp Diversity and the Health of an Ecosystem](#) (Project Resource, Grade 7)
- [Fungus and Frog Population Decline](#) (Project Resource, Grades 9-12)
- [Sea Levels and Climate Change](#) (Project Resource, Grades 9-12)
- [Humans are Impacting the Climate](#) (Project Resource, Grades 9-12)
- [Can Prairie Dogs Talk?](#) (Website, Grade 9-12)
- [Dolphins and Humans Fishing Together](#) (Website, Grade 9-12)
- [Easter Island Deforestation](#) (Website, Grade 9-12)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 9-12)
- [Ant Cooperation](#) (Website, Grade 9-12)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 9-12)
- [The Mystery of the Missing Bees](#) (Website, Grade 9-12)
- [Ocean Acidification](#) (Graphic, Grades 9-12)
- [Precious Plastic](#) (Website, Grade 9-12)
- [Shrew Caravan](#) (Website, Grade 9-12)
- [Terraforming Mars](#) (Website, Grade 9-12)
- [Termite Olympics](#) (Website, Grade 9-12)
- [The Gravity Light](#) (Website, Grade 9-12)

Standard 4: Environmentally literate students construct and apply understanding of the consequences of human-induced environmental change on individual and collective health and well-being.

- [NatGeo: Watershed](#) (Encyclopedic Entry, Grades 6-8)
- [Biosphere 2](#) (Website, Grade 6-8)
- [Ice Turns Himalayan Rabbits Black](#) (Website, Grade 6-8)
- [Indestructible Coating - Polyurea](#) (Website, Grade 6-8)
- [Aerogels - World's Lightest Solids](#) (Website, Grade 6-8)
- [Natural Fish Lure | Lamprolites Mussel and Bass](#) (Website, Grade 6-8)
- [Precious Plastic](#) (Website, Grade 6-8)
- [Why Does the Wind Blow?](#) (Website, 6-8)
- [The Driest Place on Earth](#) (Website, Grade 6-8)
- [Yellowstone Supervolcano](#) (Website, Grade 6-8)
- [Attack of the Killer Fungi](#) (Website, Grade 6-12)
- [Algae Fuel and Food](#) (Website, Grade 6-12)
- [Vegetable Oil as Fuel](#) (Website, Grade 6-12)
- [Corn Cob Sprouting in Water](#) (Website, Grade 6-12)
- [Easter Island Deforestation](#) (Website, Grade 6-12)
- [Earthships](#) (Website, Grade 6-12)
- [Galapagos Finch Evolution](#) (Website, Grade 6-12)
- [Glacier National Park is Melting Away](#) (Website, Grade 6-12)
- [The Mystery of the Missing Bees](#) (Website, Grade 6-12)
- [The Dark Snow Project](#) (Website, Grade 6-12)
- [The Great Oxygenation Event](#) (Website, Grade 6-12)
- [The Marianas Trench - Deepest Ocean](#) (Website, 6-12)
- [The Salmon Cannon](#) (Website, Grade 6-12)
- [Towing an Iceberg to the UAE](#) (Website, Grade 6-12)
- [UAE Building a Mountain to Increase Rainfall](#) (Website, Grade 6-12)
- [Why Do Humans Have Different Colored Skin?](#) (Website, Grade 6-12)
- [NatGeo: To the Ends of the Earth](#) (Article, Grades 6-12)
- [WHO: Climate Change and Health](#) (Fact Sheet, Grades 6-12)
- [NatGeo: How to Care for the Ocean](#) (Video, Grades 6-12)
- [Ant Cooperation](#) (Website, Grade 9-12)
- [Attack of the Killer Fungi](#) (Website, Grade 9-12)
- [Can Prairie Dogs Talk?](#) (Website, Grade 9-12)
- [Dolphins and Humans Fishing Together](#) (Website, Grade 9-12)
- [Epic Mudslide Caught on Camera](#) (Website, Grade 9-12)
- [How Was the Grand Canyon Formed?](#) (Website, Grade 9-12)
- [PBLWorks: There's WHAT in My Water?!](#) (Project Resource, Grades 9-12)
- [Megafauna Extinction: Humans or Climate?](#) (Website, Grade 9-12)
- [NASA: GPM and Food Security](#) (Videos, Grades 9-12)
- [Ocean Acidification](#) (Website, Grade 9-12)
- [Shrew Caravan](#) (Website, Grade 9-12)
- [The Asteroid That Killed the Dinosaurs](#) (Website, Grade 9-12)
- [Terraforming Mars](#) (Website, Grade 9-12)
- [Termite Olympics](#) (Website, Grade 9-12)
- [The Gravity Light](#) (Website, Grade 9-12)

Appendix D – Research Supporting Environmental Literacy

The Maryland State Department of Education supports evidence-based research across the complex field of environmental education. These resources of peer-reviewed scientific literature make the case for connecting children with nature.

Ardoin, N. M., Bowers, A. W., Roth, N. W., & Holthuis, N. (2018). [Environmental education and K-12 student outcomes: A review and analysis of research](#). *The Journal of Environmental Education*, 49(1), 1-17.

Barrette, M., Boyer, W., Naylor, P. J., & Harper, N. (2022). [Defining a nature-based literacy: A research synthesis review of health-promoting literacies to promote nature engagement](#). *Journal Of Adventure Education And Outdoor Learning*.

Chawla, L., (2015). [Benefits of nature contact for children](#). *Journal of Planning Literature*, 30(4), 433-452.

Dennis, Jr. S. F., Wells, A., Bishop, C., (2014). [A post-occupancy study of nature-based outdoor classrooms in early childhood settings](#). *Children, Youth and Environments*, 24(2), 35-52.

Dieser, O., Bogner, F.X., (2016). [Young people’s cognitive achievement as fostered by hands-on-centred environmental education](#). *Environmental Education Research*, 22(7), 943-957.

Gray, P., Elser, C.F., Klein, J.L., Rule, A.C., (2016). [Literacy and arts-integrated science lessons engage urban elementary students in exploring environmental issues](#). *Science Education International*, 27(1), 151-175.

Hoover, K. S. (2021). [Children in nature: Exploring the relationship between childhood outdoor experience and environmental stewardship](#). *Environmental Education Research*, 27, 894-910.

Johnstone, A., Martin, A., Cordovil, R., Fjørtoft, I., Iivonen, S., Jidovtseff, B., et al. (2022). [Nature-based early childhood education and children's social, emotional and cognitive development: A mixed-methods systematic review](#). *International Journal Of Environmental Research And Public Health*, 19.

Li, C. J., Monroe, M. C., Oxarart, A., & Ritchie, T. (2021). [Building teachers' self-efficacy in teaching about climate change through educative curriculum and professional development](#). *Applied Environmental Education & Communication*, 20, 34 - 48.

Lindemann-Matthies, P., Benkowitz, D., & Hellinger, F. (2021). [Associations between the naturalness of window and interior classroom views, subjective well-being of primary school children and their performance in an attention and concentration test](#). *Landscape And Urban Planning*, 214.

Lindgren, S., Morris, K., & Price, A. (2021). [Designing environmental storylines to achieve the complementary aims of environmental and science education through science and engineering practices](#). *The Journal Of Environmental Education*, 52, 239 - 255.

Morag, O., Tal, T., (2012). [Assessing learning in the outdoors with the field trip in natural environments \(FiNE\) framework](#). *International Journal of Science Education*, 34(5), 745 - 777.

North American Association for Environmental Education: [Selected Studies on Benefits of Environmental Education for K-12 Students](#): A creative annotated bibliography that includes narrative descriptions of selected studies exploring the benefits of Environmental Education for K-12 students.

Rios, J.M., Brewer, J., (2014). [Outdoor education and science achievement](#). *Applied Environmental Education & Communication*, 13(4), 234-240.

Ruiz-Gallardo, J., Verde, A., Valdes, A., (2013). [Garden-based learning: An experience with “at risk” secondary education students](#). *The Journal of Environmental Education*, 44(4), 252-270.

Stevenson, K. T., Peterson, M. N., Bondell, H. D., Mertig, A. G., Moore, S. E., (2013). [Environmental, institutional, and demographic predictors of environmental literacy among middle school children](#). *PLOS One*, 8(3), e59519

Thompson, R., Fisher, H. L., Dewa, L. H., Hussain, T., Kabba, Z., & Toledano, M. B. (2022). [Adolescents' thoughts and feelings about the local and global environment: A qualitative interview study](#). *Child And Adolescent Mental Health*, 27, 4-13.

Wells, N.M., Myers, B.M., Todd, L.E., Barale, K., Gaolach, B., Ferenz, G., Aitken, M., Henderson, C.R., Tse, C., Pattison, K.O., Taylor, C., Connerly, L., Carson, J.B., Gensemer, A.Z., Franz, N.K., (2015). [The effects of school gardens on children’s science knowledge: A randomized controlled trial of low-income elementary schools](#). *International Journal of Science Education*, 37(17), 2858-2878.

Williams, D. R., Dixon, P. S., (2013). [Impact of garden-based learning on academic outcomes in schools: Synthesis of research between 1990 and 2010](#). *Review of Educational Research*, 1 -25.

Wu, C-D., McNeely, E., Cedeño-Laurent, J. G., Pan, W-C., Adamkiewicz, G., Dominici, F., Candice Lung, S-C., Su, H-J., Spengler, J. D., (2014). [Linking student performance in Massachusetts elementary schools with the "greenness" of school surroundings using remote sensing](#). *PLOS ONE*, 9(10)