

## Environmental Science – Unit 6

### Environmental Science Unit 6 – Human Health, Economics, Policy, and the Future

**Unit Overview:** Unit 6 is composed of two chapters- *The Environment and Human Health* and *Economics, Policy and the Future*. Students will study pollution and how it affects human health including biological hazards. Students will learn about human diseases that have an environmental component and the transmission of these diseases due to factors in the environment such as water and cross species transfers. In the final chapter of this course, students will learn about economics and international cooperation. Students will be able to describe different environmental policies in the United States and be able to give examples of federal agencies that have environmental responsibilities. Examples of how citizens can affect environmental policies at each level of government: local, state, and national including the use of media as a source of information about the environment will be studied. Students will be able to give specific examples of individuals that have influenced environmental history. Finally, students will be able to identify ways in which the choices that they make may affect the environment.

#### Essential Questions:

##### Chapter 20- The Environment and Human Health

- Can you list five pollutants, their sources and their possible effects on human health?
- What is the relationship between waste, pollution, and human health?
- Can you list examples of pollution that come from natural sources?
- What are changes to the environment that can lead to the spread of infectious diseases?
- What is environmental justice?

##### Chapter 21-Economics, Policy and the Future

- Can you describe how economics and environmental science are related?
- Compare two ways that governments influence economics.
- Can you list international meetings, organizations and agreements related to sustainability? Climate and the atmosphere? the environment?
- How do governments and their policies impact the issue of climate change?
- How can citizens play a role with environmental justice?
- Give an example of how citizens can affect environmental policy.

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### Living Environment Core Curriculum- MST Standards

**Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life.**

**5.2 Explain disease as a failure of homeostasis**

**Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.**

**7.1- Describe the range of interrelationships of humans with the living and nonliving environment.**

**7.2-Explain the impact of technological development and growth in the human population on the living and nonliving environment.**

**7.3-Explain how individual choices and societal actions can contribute to improving the environment.**

### New York State Science Learning Standards Performance Expectations

**HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.**

**HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.**

**HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.**

**HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.**

**HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.**

**HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.**

**HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.**

**HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.**

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Environmental Science Content	NYSSLS Disciplinary Core Ideas	Additional Resources	Project Based Resources and Activities - Version 1 Scaffolded with Supports	Project Based Resources and Activities - Version 2
<p><b>Chapter 20- The Environment and Human Health</b></p> <p><b>Section 1-Pollution and Human Health</b></p> <ul style="list-style-type: none"> <li>List five pollutants, their sources, and their possible effects on human health</li> <li>Explain how pollution can come from both natural sources and human activities</li> <li>Describe the relationship between waste, pollution and human health</li> </ul> <p><b>Section 2- Biological Hazards</b></p> <ul style="list-style-type: none"> <li>Explain why the environment is an important factor in the spread of cholera</li> <li>List two changes to the environment that can lead to the spread of infectious diseases</li> </ul>	<ul style="list-style-type: none"> <li>A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.</li> <li>Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.</li> <li>Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation.</li> <li>When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.</li> <li>Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade offs) may be needed.</li> <li>Disease is a failure of homeostasis. Organisms have a variety of mechanisms to prevent and combat disease. Technological advances including vaccinations and</li> </ul>	<p><b>Text Resource</b> <i>Environmental Science – Holt Chapter 20 - pp. 511-523</i></p> <p><b>Student Resources</b> <a href="#">Buffalo Waterkeepers Guide to Invasive Plant Species</a> – Guide to local invasive species that impact Buffalo River Ecosystems.</p> <p><b>Teacher Resource</b> <a href="#">How do you solve a problem like Malaria?*</a> This lesson from the BPS Office of CLRI is designed to teach the biological process by which the plasmodium parasite causes Malaria.</p> <p><a href="#">Crisis at West Valley – Rich Newberg Segments*</a> This series of reports deals with the challenges involved in cleaning up one of WNY’s most toxic hot spots located in West Valley, N.Y.</p> <p><a href="#">Love Canal – NYS Retro Report Video Link*</a> – 35 years after Love Canal became the symbol of the dangers of toxic waste in a residential neighborhood in Niagara Falls, NY</p> <p><a href="#">A Fierce Green Fire*</a> – This video resource documentary chronicles 50 years of grassroots and global activism connecting the major causes of environmentalism from conservation to climate change.</p> <p><a href="#">A Fierce Green Fire: Student Resource*</a> – Student resource document to accompany <i>A Fierce Green Fire</i>.</p>	<p><b>Environmental Justice in Your Neighborhood Lesson Series*</b> This lesson series provides teachers with activities concerning environmental justice within a student’s environment. The activities explore inequality in the WNY community related to pollution and green space. Lessons can be used as a series that build upon learning or as stand-alone activities. <a href="#">Lesson Series Teacher Notes</a></p> <p><b>Lesson 1 – Introduction to Environmental Justice*</b> This lesson introduces students to environmental justice. <a href="#">Lesson 1 – Introduction to Environmental Justice Student Worksheet</a></p> <p><b>Lesson 2 – Assessing Pollution in Your Environment*</b> This lesson explores the causes and impact of pollution using the Love Canal Disaster as a primary resource. Students then use a virtual mapping activity to assess pollution in their environment. <a href="#">Lesson 2 - Assessing Pollution in Your Environment Student Worksheet</a></p> <p><b>Lesson 3 – Assessing Green Space in Your Environment*</b> Students engage in a critical thinking activity assessing green</p>	<p><b>Environmental Justice in Your Neighborhood Lesson Series*</b> This lesson series provides teachers with activities concerning environmental justice within a student’s environment. The activities explore inequality in the WNY community related to pollution and green space. 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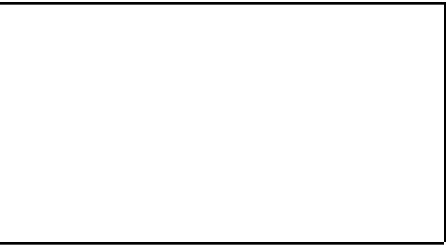
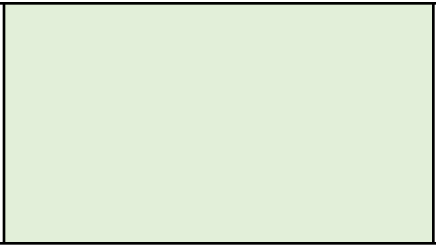
	<p>antibiotics have contributed to the prevention and treatment of disease.</p>		<p>space in their environment. Students then use a virtual mapping tool to determine the available green space in their neighborhoods.  <a href="#">Lesson 3 – Assessing Green Space in Your Environment Student Worksheet</a></p>	<p>space in their environment. Students then use a virtual mapping tool to determine the available green space in their neighborhoods. Students will compose a persuasive letter to a local government official making a case to increase their neighborhood greenspace.  <a href="#">Lesson 3 – Assessing Green Space in Your Environment Student Worksheet</a>  <a href="#">Persuasive Letter Graphic Organizer</a>  <a href="#">Persuasive Letter Rubric</a></p>
<p><b>Chapter 21-Economics, Policy, and Future</b>  <b>Section 1-Economics and International Cooperation</b></p> <ul style="list-style-type: none"> <li>Describe some of the challenges to achieving sustainability</li> <li>Describe several major international meetings and agreements relating to the environment</li> <li>Explain how economics and environmental science are related</li> <li>Compare two ways that governments influence economics</li> </ul> <p><b>Section 2- Environmental Policies in the U.S</b></p> <ul style="list-style-type: none"> <li>Describe two major developments in U.S environmental history</li> <li>Give examples of three federal agencies that have environmental responsibilities</li> <li>Give an example of how citizens can affect environmental policy at each level of government- local, state and national</li> <li>Evaluate the media as a source of information about the environment</li> </ul>	<ul style="list-style-type: none"> <li>A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.</li> <li>Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.</li> <li>Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation.</li> <li>When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and</li> </ul>	<p><b>Text Resource</b>  <i>Environmental Science – Holt Chapter 21 - pp. 533-547</i></p> <p><b>Student Resources</b>  <a href="#">Our Climate Our Future</a> – Video series that educates young people on the science of climate change and empowers them to take action.</p> <p><b>Teacher Resources</b>  <a href="#">U.S. Environmental Protection Agency (EPA) Greener Living</a> – Tools and resources for understanding environmental issues and ways to help reduce environmental footprint.</p> <p><a href="#">Climate Literacy &amp; Energy Awareness Network (CLEAN)</a> – Collection of climate and energy educational resources aligned to NGSS.</p> <p><a href="#">The Lorax</a> – animated video discusses sustainability and decision making.</p>	<p><b>Environmental News Summary</b>          Students research and summarize a current event article.  <a href="#">Environmental News Summary Student Resource Unit 6</a></p> <p><a href="#">Famous Black Scientists and You*</a>          Students choose a famous black scientist to learn about. After watching videos, reading passages, and answering questions, students create an advertisement for their scientist.</p>	<p><b>Environmental News Summary</b>          Students research and summarize two current event articles.  <a href="#">Environmental News Summary Student Resource Unit 6</a></p> <p><a href="#">Famous Black Scientists and You*</a>          Students choose a famous black scientist to learn about. After watching videos, reading passages, answering questions, and creating an advertisement for their scientist students will write an essay about their chosen scientist.</p>

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aesthetics, and to consider social, cultural, and environmental impacts.

- Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade offs) may be needed.

[Excerpts from War of the Worlds\\*](#)  
This excerpt from N.J. Amistad and War of the Worlds compares the environmental destruction of Earth to Mars.



**Unit 6 Evidence of Learning** Ticket Out • Think-Pair-Share • Formative Assessment • Weekly Quiz • Unit Test • Homework • Review Questions

**Unit 6 Materials** No extra materials required for this unit.

**Unit 6 Vocabulary** **Chapter 20**  
dose  
particulates  
risk assessment

**Chapter 21**  
economics  
sustainability

**English Language Learners (ELL) Enhancements**  
  
To access [hyperlinked](#) material, you must be logged into your BPS Google Drive

**Listening**

- Cross- Linguistic Practices:** Gives students opportunities to make connections between what they hear and their home language (For example, allow students to listen to a passage and identify cognates.)
- Build background knowledge**
- Activating Prior Knowledge** Activating prior knowledge means both eliciting from students what they already know and building initial knowledge that they need in order to access upcoming content
- Activating Prior Knowledge**
- Visuals** - GIFs, pictures- will assist students in understanding what they are listening to. Use [visual thinking strategies](#) to set the lens for learning.
- Video to review or introduce a topic – use [closed captioning](#) to help students see the words and

**Speaking**

- Sentence Frames** - to begin a sentence - such as *The water cycle is...* or *I think that water cycle is...*
- Academic Conversation Starters:** Have a visual of a list of academic sentence starters that students can refer to in a discussion. Examples include- I expect \_\_\_\_ to happen. My data shows that... This helps students have a more science focused dialogue.
- Choral Reading** - To build fluency, self-confidence and motivation with [reading/speaking](#)
- Create [movement](#) to go with the word. Movement can be a motivating factor, as well as a kinesthetic tool for conceptualizing the rhythm and flow of fluent reading while

**Reading**

- Supplementary Text** to help reinforce concepts. If necessarily, use lower Lexile levels to ensure comprehension.
- Visual Aids** - Pictures or models to support vocabulary words and concepts
- Video to review or introduce a topic - use [closed captioning](#) to help students read along while they listen to the content
- 4 Square / Frayer models** to help students gain a deeper understanding of vocabulary.
- Highlighting** important text to assist students in answering questions after the reading.
- Chunking**-Break reading of text into chunks or paragraphs
- Performance Level Descriptors** This document provides teachers with a description of what output they can expect from students based

**Writing**

- Sentence Frames** - to begin a sentence- such as *Biodiversity is...* or *An example of competition is....*
- Cloze passages** with word banks
- Word banks**
- Graphic Organizers** to help break down the writing process and organize thoughts
- Standards-based sentence stems**
- Performance Level Descriptors** This document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of writing.

**Instructional Accommodations (depending on the student’s needs)**

- Extended time** for tests in class, projects and assignments
- Directions read.** Broken down as necessary
- Model** how to complete the activity in the lesson
- Oral simplification** of directions or questions
- Translated version** of test when available. Student may have both version English and native language version
- Use of [approved bilingual glossaries](#) from NYS in each subject

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	<p>pronunciations while they listen to the content.</p> <ul style="list-style-type: none"> <li>● <b>Word stretching / Vowel stretching</b> when instructing allows student to listen closely to the pronunciation of the word</li> <li>● <b>Performance Level Descriptors</b> This document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of listening.</li> </ul>	<p>triggering brain function for optimal learning</p> <ul style="list-style-type: none"> <li>● <b>Performance Level Descriptors</b> This document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of speaking.</li> </ul>	<p>on earned NYSESLAT levels in the modality of reading.</p> <p><b>Vocabulary Morphology-</b> Morphology relates to the segmenting of words into affixes (prefixes and suffixes) and roots or base words, and the origins of words. Understanding that words connected by meaning can be connected by spelling can be critical to expanding a student’s vocabulary.</p>		
<p><b>Special Education Modifications</b></p> <p>Special Education students must have accommodations as per Individual Educational Plan (IEP)</p>	<p><b>Instructional</b></p> <ul style="list-style-type: none"> <li>● <b>Pre-teach</b> vocabulary</li> <li>● Use <b>picture vocabulary</b></li> <li>● Scaffold <b>Depth of Knowledge</b> questions</li> <li>● Provide copy of notes/<b>notes in “cloze”</b> form</li> <li>● Use of <b>Think, Pair, and Share</b> strategy to help process information</li> <li>● <b>Scaffold</b> written assignments with the use of <b>graphic organizers</b></li> <li>● Allow for <b>multiple ways to respond</b> (verbal, written, response board)</li> <li>● Provide <b>model of performance task</b></li> <li>● <b>Modify informational text</b> to fit the needs of the students</li> <li>● Provide a digital or paper <b>interactive notebook</b></li> <li>● Present complex <b>tasks in multiple ways</b></li> <li>● Provide <b>mnemonic strategies</b> for Environmental Science concepts</li> </ul>	<p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>● <b>Audio</b> reading of text</li> <li>● <b>Text to type</b> functions</li> <li>● <b>Videos</b> to clarify/visualize Environmental Science concepts</li> <li>● <b>Record class lecture/discussions</b> and make accessible to student</li> <li>● <b>Nearpod-</b> interactive presentations of notes</li> <li>● <b>Playposit</b> - show a video clip about the topic and add your own questions for them to answer as they watch</li> <li>● Allow students to type answers in chat on <b>Teams</b></li> </ul> <p><b>Other:</b></p> <ul style="list-style-type: none"> <li>● <b>Arrange seating</b> for maximum engagement and minimum distraction</li> </ul>	<p><b>In Class Assessments</b></p> <ul style="list-style-type: none"> <li>● Provide <b>review packet or review sheet</b> of concepts covered on the test</li> <li>● Practice similar questions prior to the test</li> <li>● Provide <b>multiple options</b> for projects</li> <li>● Give a <b>timeline</b> of when things are due and remind them of the process often.</li> <li>● <b>Use of timer</b> in class</li> <li>● Break all complex tasks into chunks</li> </ul>		
<p><b>Step Up to Writing</b></p> <p>Step Up to Writing materials can be found in BPS Science K-12 Schoology Folder 9-12 Resources Environmental Science Environmental Science Curriculum Materials Step Up to Writing Materials</p>	<p><b>SUTW Strategies</b></p> <ul style="list-style-type: none"> <li>● Informal Outline</li> <li>● Color-Coding – Informative/Explanatory Text</li> <li>● Two-column notes</li> <li>● I-V-F Topic Sentence progressing to Four Step Summary Paragraph</li> <li>● CUPS – Capitalization, Usage, Punctuation, Spelling</li> <li>● Transitions</li> </ul>				

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**Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom**

- Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications
- Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population
- All students are given an opportunity to engage in science discourse
- Teacher demonstrates high expectations for all students

CLRT resources which align to Science content are denoted with a \*