

Winslow Township School District

Grade 8 Science

Unit 6: Impacts on the Environment

Overview: Students analyze and interpret data and design solutions to build on their understanding of the ways that human activities affect Earth’s systems. The emphasis of this unit is the significant and complex issues surrounding human uses of land, energy, mineral, and water resources and the resulting impacts of these uses. The crosscutting concepts of cause and effect and the influence of science, engineering, and technology on society and the natural world are called out as organizing concepts for these disciplinary core ideas.

Overview	Standards for Science	Unit Focus	Essential Questions
<p><u>Unit 6</u></p> <p>Impacts on the Environment</p>	<p>MS-ESS3-3 MS-ESS3-4 MS-ESS3-5 WIDA 1,4</p>	<ul style="list-style-type: none"> • Natural hazards • Human impacts on Earth systems 	<ul style="list-style-type: none"> • How can geological events be forecast using past events? • How do human activities affect Earth systems?
<p><i>Unit 7: Enduring Understandings</i></p>	<ul style="list-style-type: none"> • Determine the epicenter of an earthquake, using seismograph readouts and a distance graph. • Students simulate the energy released during an earthquake and observe the shaking that results. • Students use topographic map to predict where mudflows might occur. • Students model population growth. • Students model restoring the land after coal mining • Students analyze a graph of nitrate concentration in well water • Students analyze an AQI table • Students design an eco-friendly city. 		

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Curriculum Unit 6	Standards		Pacing	
			Days	Unit Days
Unit 6: Impacts on the Environment	MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	13	45
	MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	13	
	MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	13	
	Assessment, Re-teach and Extension		6	

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Disciplinary Core Ideas	Indicator #	Indicator
<p>ESS3.C: Human Impacts on Earth Systems</p> <p>Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things.</p> <p>Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.</p> <p>ESS3.D: Global Climate Change</p> <p>Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth’s mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.</p>	MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
	MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.
	MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

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Assessment Plan

- Exploratory activities
- Warm-up activities
- Individual/Group Lab report
- Class discussions
- Student Participation
- Teacher Observations

- Quizzes
- Tests
- Authentic assessments and projects
- Presentations
- Science Interactive Notebook

Resources

- Chromebooks
 - Textbook
 - [rock cycle](#)
 - [BrainPOP](#)
 - [Study JamsScholastic Science World Magazine](#)
 - Page Keeley Science probes
 - [Readworks](#)
 - [NewsELA](#)
 - [PhET simulations](#)
 - [seismograph activity](#)
- Diversity, Equity & Inclusion Educational Resources**
<https://www.nj.gov/education/standards/dei/>

Activities

- How do seismograph stations help determine an earthquake epicenter?
Online activity
- Students explore the cause of earthquake activity along faults
- Students identify and assess volcanic hazards at three locations on Mount Rainier
Students will model exponential population growth by adding dried beans to a beaker, doubling the number each time
- Students observe the challenges involved in restoring mined land
- Students analyze changes in nitrate concentrations in well water
- Students analyze an Air Quality Index and apply the content to decisions about human health
- Students design a city with environmentally responsible structures and practices, and make a presentation to a mock city planning board

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Instructional Best Practices and Exemplars

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| <ol style="list-style-type: none"> 1. Identifying similarities and differences 2. Summarizing and note taking 3. Reinforcing effort and providing recognition 4. Homework and practice 5. Nonlinguistic representations | <ol style="list-style-type: none"> 6. Cooperative learning 7. Setting objectives and providing feedback 8. Generating and testing hypotheses 9. Cues, questions, and advance organizers 10. Manage response rates |
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9.1 Personal Financial Literacy, 9.2 Career Awareness, Exploration, Preparation and Training & 9.4 Life Literacies and Key Skills

- 9.1.8.CR.4: Examine the implications of legal and ethical behaviors when making financial decisions.
- 9.1.8.PB.1: Predict future expenses or opportunities that should be included in the budget planning process.
- 9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
- 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
- 9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
- 9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change (e.g., 1.1.8.C1b).
- 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
- 9.4.8.TL.4: Synthesize and publish information about a local or global issue or event (e.g., MS- LS4-5, 6.1.8.CivicsPI.3).

The implementation of the 21st Century skills and standards for students of the Winslow Township District is infused in an interdisciplinary format in a variety of curriculum areas that include, English language Arts, Mathematics, School Guidance, Social Studies, Technology, Visual and Performing Arts, Science, Physical Education and Health, and World Language.

Additional opportunities to address 9.1, 9.2 & 9.4:

Philadelphia Mint

<https://www.usmint.gov/learn/kids/resources/educational-standards>

Different ways to teach Financial Literacy.

<https://www.makeuseof.com/tag/10-interactive-financial-websites-teach-kids-money-management-skills/>

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Modifications for Special Education/504

Students with special needs: The students' needs will be addressed on an individual and grade level using a variety of modalities. Accommodations will be made for those students who need extra time to complete assignment. Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered.

- Small group instruction
- Audio books/ Text-to-speech platforms
- Leveled texts/Vocabulary Readers
- Leveled informational texts via online
- Modeling and guided practice
- Read directions aloud
- Repeat, rephrase and clarify directions
- Extended time as needed
- Break down assignments into smaller units
- Provide shortened assignments
- Modify testing format
- Repeat directions as needed
- Graphic organizers
- Study Guides, Study Aids and Re teaching as needed

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Modifications for At-Risk Students

Formative and summative data will be used to monitor student success. At first signs of failure, student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations

- Audio books and Text-to-speech platforms
- Leveled texts/Vocabulary Readers
- Leveled informational texts via online
- Extended time as needed
- Read directions aloud
- Assist with organization
- Use of computer
- Emphasize/highlight key concepts
- Recognize success
- Provide timelines for work completion
- Break down multi-step tasks into smaller chunks
- Provide copy of class notes and graphic organizer

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English Language Learners	Modifications for Gifted Students
<p>All WIDA Can Do Descriptors can be found at this link: https://wida.wisc.edu/teach/can-do/descriptors</p> <p><input type="checkbox"/> Grades 6-8 WIDA Can Do Descriptors:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Listening <input type="checkbox"/> Speaking <input type="checkbox"/> Reading <input type="checkbox"/> Writing <input type="checkbox"/> Oral Language <p>Students will be provided with accommodations and modifications that may include:</p> <ul style="list-style-type: none"> • Relate to and identify commonalities in Science studies in student’s home country • Assist with organization • Use of computer • Emphasize/highlight key concepts • Teacher Modeling • Peer Modeling • Label Classroom Materials - Word Walls 	<p>Students excelling in mastery of standards will be challenged with complex, high level challenges related to the topic.</p> <ul style="list-style-type: none"> • Raise levels of intellectual demands • Require higher order thinking, communication, and leadership skills • Differentiate content, process, or product according to student’s readiness, interests, and/or learning styles • Provide higher level texts • Expand use of open-ended, abstract questions • Critical and creative thinking activities that provide an emphasis on research and in-depth study • Enrichment Activities/Project-Based Learning/ Independent Study <p>Additional Strategies may be located at the links:</p> <ul style="list-style-type: none"> ❖ Gifted Programming Standards ❖ Webb’s Depth of Knowledge Levels and/or Revised Bloom’s Taxonomy ❖ REVISED Bloom’s Taxonomy Action Verbs

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Interdisciplinary Connections

ELA:

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

RST.6-8.10 read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

WHST.6-8.1 Write arguments focused on *discipline-specific content*.

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Math:

6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

7.RP.A.2 Recognize and represent proportional relationships between quantities.

MP.2 Reason abstractly and quantitatively.

Integration of Computer Science and Design Thinking NJSLS 8

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.

8.1.8.DA.5: Test, analyze, and refine computational models.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users