Winslow Township School District

Grade 5 Science

Unit 2: Energy and Ecosystems

Overview: In this unit of study, students make observations and use models to understand how energy flows and matter cycles through organisms and ecosystems. Students will understand that plants acquire their material for growth chiefly from air and water. Lastly, students will learn that energy from the sun is transferred to plants, which then use that energy to change air and water into plant matter.

Overview	Standards for Science	Unit Focus	Essential Questions
Unit 2 **Energy and Ecosystems**	• **5-PS3-1** • **5-LS2-1** • **WIDA 1,4**	• Identify the living and nonliving components of a system. • Describe the interactions that occur between the living and nonliving components of each system • Develop models (such as food chains or food webs) that describe the movement of matter among plants, animals, decomposers, and the environment.	• How is life dependent on the sun? • What are the dynamics of life on Earth? • How do animals and plants get energy?
Unit 2: Enduring Understandings	• In every habitat and ecosystem on Earth, plants and animals survive, grow, reproduce, die, and decay. • Plants acquire their material for growth chiefly from air and water (not from soil) and plants use energy from the sun to transform air and water into plant matter. • Organisms are related in food webs in which some animals eat plants for food and other eat the animals that eat plants. • A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. • Matter cycles between the air and soil and among plants and animals as these organisms live and die.		

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Curriculum Unit 2	Standards		Pacing	
			Days	Unit Days
Unit 2: **Molecules to Organisms**	**5-PS3-1**	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	20	45
	5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	20	
	Assessment, Re-teach and Extension		5	

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Unit 2 Grade 5		
Disciplinary Core Ideas	**Indicator #**	**Indicator**
PS3.D: Energy in Chemical Processes and Everyday Life The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) **LS1.C: Organization for Matter and Energy Flow in Organisms** Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)	**5-PS3-1**	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
LS2.A: Interdependent Relationships in Ecosystems The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1) **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)	**5-LS2-1**	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

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<table>
<tr><th colspan="2">Unit 2 Grade 5</th></tr>
<tr><th colspan="2">• Assessment Plan</th></tr>
<tr><td>• Class discussions
• Independent & group work/projects
• Teacher and/or book series provided quizzes, tests, and a performance task to assess student mastery.
• Homework monitor and assess class work
• Benchmark assessments</td><td>• Short Constructed Responses
• Students will conduct research to determine the effects of newly introduced species to an ecosystem. Then they will write a research paper about the species.</td></tr>
<tr><th>Resources</th><th>Activities</th></tr>
<tr><td>• Chromebooks
• <u>HSP Science Book correlations:</u> page 184-207
• Competitive activity relating to food webs and energy transfer: https://www.brainpop.com/games/foodfight/
• Organism (sharks and prey) interactions and symbiotic relationships. http://www-tc.pbs.org/wnet/nature/files/2008/12/symbiotic-strategies.pdf
• Montclair State Rainforest Virtual Classroom
http://www.montclair.edu/csam/prism/rainforest-connection/
• Root Beer Activity Document to explore transfer of energy www.engr.sjsu.edu/tanagnos/Ecology/Root_Beer_Activity.doc
• Diversity, Equity & Inclusion Educational Resources
https://www.nj.gov/education/standards/dei/</td><td>• Students will demonstrate the flow of energy in a small system such as a food web using a drawing.
• Students will write an informational essay that explains how photosynthesis comes from the sun and what it used for.
• mini-lessons
• independent reading
• films
• website exploration
• discussions, dialogues
• debates
• partner or small group work
• student presentations, reports, journals, reflections,
• in-class assessments,
• written reports, essays, research, and homework</td></tr>
</table>

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Instructional Best Practices and Exemplars	
1. Identifying similarities and differences 2. Summarizing and note taking 3. Reinforcing effort and providing recognition 4. Homework and practice 5. Nonlinguistic representations	6. Cooperative learning 7. Setting objectives and providing feedback 8. Generating and testing hypotheses 9. Cues, questions, and advance organizers 10. Manage response rates

9.1 Personal Financial Literacy, 9.2 Career Awareness, Exploration, Preparation and Training & 9.4 Life Literacies and Key Skills

9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).
9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).
9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.
9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.
9.4.5.IML.6: Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions (e.g., RI.5.7, 6.1.5.HistoryCC.7, 7.1.NM. IPRET.5).

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
All WIDA Can Do Descriptors can be found at this link: https://wida.wisc.edu/teach/can-do/descriptors ☐ Grades 4-5 WIDA Can Do Descriptors: ☐ Listening ☐ Speaking ☐ Reading ☐ Writing ☐ Oral Language Students will be provided with accommodations and modifications that may include: • 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	Students excelling in mastery of standards will be challenged with complex, high level challenges related to the topic. • 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 Additional Strategies may be located at the links: ❖ 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 Standards: **RI.5.1.** Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. **RI.5.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*. **RI.5.7.** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. **NJSLSA.W7.** Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation. **NJSLSA.W8.** Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. **NJSLSA.W6.** Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. **Math Standards:** **5.MDA.1.** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. **5.MDB.2.** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.* **5.MDC.3.A** Recognize volume as an attribute of solid figures and understand concepts of volume measurement. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. **5.MDC.3.B**. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units. **5.MDC.4.** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units. **5.MDC.5.A.** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

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Integration of Computer Science and Design Thinking NJSLS 8
8.1.5.CS.1: Model how computing devices connect to other components to form a system. **8.1.5.NI.1:** Develop models that successfully transmit and receive information using both wired and wireless methods. **8.2.5.ITH.1:** Explain how societal needs and wants influence the development and function of a product and a system. **8.2.5.ITH.2:** Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. **8.2.5.ITH.3:** Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use. **8.2.5.ITH.4:** Describe a technology/tool that has made the way people live easier or has led to a new business or career. **8.2.5.EC.1**: Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.