Winslow Township School District
Grade 6 Science
Unit 1: Science and Engineering Processes

Overview: In this unit students will develop a conceptual understanding of the science process using hands-on instruction, interactive note booking, observations of and interactions with natural phenomena and the use of engineering and design processes to identify problems, plan, test and revise possible solutions. Students are expected to demonstrate proficiency in developing and using models and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Overview	Standards for Science	Unit Focus	Essential Questions
Unit 1 **Science and Engineering Processes**	• **MS-ETS1-1** • **MS-ET1-2** • **MS-ETS1-3** • **MS-ETS1-4** • **WIDA 1,4**	• Develop writing through note-booking • Compare scientific laws and scientific theories • Organize and display data in tables, charts and graphs • Utilize measurement equipment • Identify units of measurement • Relate scientific inquiry to real-life scientific investigations	• What processes do scientists use when they perform scientific investigations? • How can science provide answers to your questions about the world around you?
Unit 1: Enduring Understandings	• Scientific inquiry is a process used to investigate aspects of the world and construct reasonable explanations. • Scientists use the scientific method to develop a test that answers a question. • Sometimes an experiment often not prove a hypothesis to be true. • Scientists analyze and communicate results by using charts, tables and graphs.		

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Curriculum Unit 1	Standards		Pacing	
			Days	Unit Days
Unit 1: **Science and Engineering Processes**	MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	4	20
	MS-ET1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	4	
	MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	4	
	MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	4	
	Assessment, Re-teach and Extension		4	

Unit 1 Grade 6		
Disciplinary Core Ideas	**Indicator #**	**Indicator**
ETS1.A: Defining and Delimiting Engineering Problems The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)	MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
	MS-ET1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
ETS1.B: Developing Possible Solutions A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4)	MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
ETS1.C: Optimizing the Design Solution Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)	MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

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Unit 1 Grade 6	
• **Assessment Plan**	
• Exploratory activities • Warm-up activities • Individual/Group Lab report • Class discussions • Student Participation • Teacher Observations	• Quizzes • Tests • Authentic assessments and projects • Exploratory activities • Presentations
Resources	**Activities**
• Chromebooks • Textbook • Reading Essentials Workbook • Web Quests • VIrtual Field Trips • Video Streaming • BrainPOP • Puzzlemaker: Game Based Learning | Discovery Education **Diversity, Equity & Inclusion Educational Resources** https://www.nj.gov/education/standards/dei/	• Use various forms of expository writing-procedural writing, narrative writing, descriptive writing, labeling, as well as to create visuals, graphs, tables, diagrams and charts. • Use scientific argumentation with exercises on writing claims, using evidence to support your claim and explaining the reasoning behind their claim. • 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

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

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

9.1.8.CP.1: Compare prices for the same goods or services.

9.1.8.PB.7: Brainstorm techniques that will help decrease expenses including comparison shopping, negotiating, and day-to-day expense management.

9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).

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.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.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation.

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.

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/

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

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 6-8 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

Interdisciplinary Connections
ELA: **RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts. **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). **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. **Math:** **MP.2** Reason abstractly and quantitatively. **MP.4** Model with mathematics. **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. **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.6** 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.

Integration of Computer Science and Design Thinking NJSLS 8
8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies. 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.5: Test, analyze, and refine computational models.