

Winslow Township School District
Grade 2 Science
Unit 1: Exploring Matter and Energy in Motion

Overview: In this unit of study, students demonstrate an understanding of observable properties of materials through analysis and classification of different materials. Students will explore observable properties of materials through analysis and classification of different materials. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data.

Overview	Standards for Science	Unit Focus	Essential Questions
<p><u>Unit 1</u></p> <p>Exploring Matter and Energy in Motion</p>	<ul style="list-style-type: none"> • 2-PS1-2 • 2-PS1-3 • 2-PS1-4 • K-2-ETS1-2 • K-2-ETS1-3 • WIDA 1,4 	<ul style="list-style-type: none"> • Identify properties of matter • Classify matter according to its observable properties • Critique the effectiveness of a material being used for a specific purpose. • Carry out tests to determine the effectiveness of a design • Disassemble and combine materials to make new objects • Observe the effect of heating and cooling on different types of matter • Apply knowledge from observations to engineer solutions to problems 	<ul style="list-style-type: none"> • How can we describe the differences and similarities between different kinds of matter? • How do the properties of matter affect an object’s usefulness or purpose?
<p><i>Unit 1: Enduring Understandings</i></p>	<ul style="list-style-type: none"> • Matter can be classified by observable properties. • Light passes more easily through some objects than others • Light, heat, and sound are forms of energy that interact with matter • Heat comes from various sources that can be transferred • Vibration of objects and air create sound • Sound travels through solids, liquids, and gases differently and travels in all directions • The pitch of sound is its highness of lowness and the volume of sound is its loudness and softness. 	<ul style="list-style-type: none"> • How can matter be combined or deconstructed to create something new and helpful? • What happens when different types of matter are heated or cooled? 	

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Curriculum Unit 1	Standards		Pacing	
			Days	Unit Days
Unit 1: Exploring Matter and Energy in Motion	2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.	8	45
	2-PS1-3	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.	8	
	2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.	8	
	K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	8	
	K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	8	
	Assessment, Re-teach and Extension		5	

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Unit 1 Grade 2

Disciplinary Core Ideas	Indicator #	Indicator
<p>PS1.A: Structure and Properties of Matter Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3) A great variety of objects can be built up from a small set of pieces. (2-PS1-3)</p> <p>PS1.B: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)</p> <p>ETS1.B: Developing Possible Solutions Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (K-2-ETS1-2)</p> <p>ETS1.C: Optimizing the Design Solution Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)</p>	2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
	2-PS1-3	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
	2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
	K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
	K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

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• Assessment Plan

- 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
- Teacher Observations
- Performance Tasks

- Short Constructed Responses
- Observe patterns in events generated due to cause-and-effect relationships.
- Construct an argument with evidence to support a claim.
- Construct an argument with evidence that some changes caused by heating or cooling can be reversed, and some cannot. Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, or heating paper.

Resources

- Chromebooks
- HSP Science Teacher Manual
- Lab Explorations
- Big Books pg.
- Leveled Readers
- Activity book
- Vocab activities and cards
- Group discussions
- Manipulatives
- SMARTboard / Mimio Technology
- Google Applications (Documents, Forms, Spreadsheets, Presentation)
- Linkit
- Readworks website
- [NJ Department of Education](#)
- Harcourt HSP New Jersey Science textbook
- HSP Lab Manual
- HSP New Jersey Science-Teacher's Inquiry Tool Kit
- Lesson Planner Resource Pages
- Science Leveled Readers and Science Guides
- HSP Science eBook
- Chromebooks
- Anchor Charts

Activities

[STEM in a BOX - Shakin' Up the Classroom](#): Students will examine and describe materials and their properties in order to assemble these materials into a strong building that could withstand the earth shaking.

[Thousands of tiny pieces can create something big](#): Students be introduced to Watt's tower, a tower made of many pieces of junk in the neighborhood. Students will then make their own objects out of many pieces or materials that the teacher provides and the students think about and discuss whether they could use the same set of materials to make something different.

[Take it apart, put it together](#): Students will take apart an old appliance and making a new object using the appliance parts. Students will use a variety of prompts and individual journaling to track their idea development, questions, changing plans, and evidence-based explanations.

[The Magic School Bus Bakes in a Cake](#): Students will read or watch [The Magic School Bus Bakes a Cake, or Ready Set Dough](#). Students will observe and discuss chemical and physical changes while baking.

[The Science of Macaroni Salad \(and 2. Dig Deeper\)](#): Students will watch and discuss what is involved when a physical and chemical change occurs.

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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

- 9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
- 9.4.2.CI.2:** Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
- 9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- 9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- 9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- 9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
- 9.4.2.TL.2:** Create a document using a word processing application.
- 9.4.2.TL.3:** Enter information into a spreadsheet and sort the information.
- 9.4.2.TL.6:** Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
- 9.4.2.TL.7:** Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts (e.g., W.2.6., 8.2.2.ED.2).

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"/> Grade 2 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

Interdisciplinary Connections:

ELA Standards:

W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS2-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS2-3)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

Math Standards:

MP.2 Reason abstractly and quantitatively. (2-ESS2-2)

MP.4 Model with mathematics. (2-ESS2-2)

2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)

Integration of Computer Science and Design Thinking NJSLS 8

8.1.2.DA.2: Store, copy, search, retrieve, modify, and delete data using a computing device.

8.1.2.DA.3: Identify and describe patterns in data visualizations.

8.1.2.DA.4: Make predictions based on data using charts or graphs.

8.1.2.AP.4: Break down a task into a sequence of steps.

8.1.2.AP.5: Describe a program's sequence of events, goals, and expected outcomes.

8.2.2.ED.1: Communicate the function of a product or device.

8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.

8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.

8.2.2.ED.4: Identify constraints and their role in the engineering design process.

8.2.2.ITH.1: Identify products that are designed to meet human wants or needs.

8.2.2.ITH.2: Explain the purpose of a product and its value.

8.2.2.NT.1: Model and explain how a product works after taking it apart, identifying the relationship of each part, and putting it back together.

8.2.2.NT.2: Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.