

**Winslow Township School District**

**Grade 5 Science**

**Unit 3: Earth, Moon, and Beyond**

**Overview:** In this unit of study, students explore the effects of gravity and determine the effect that relative distance has on the apparent brightness of stars. They also will collect and analyze data in order to describe patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

Overview	Standards for Science	Unit Focus	Essential Questions
<p><a href="#"><u>Unit 3</u></a></p> <p><b>Earth, Moon, and Beyond</b></p>	<ul style="list-style-type: none"> <li>• <b>5-ESS1-1</b></li> <li>• <b>5-ESS1-2</b></li> <li>• <b>WIDA 1,4</b></li> </ul>	<ul style="list-style-type: none"> <li>• Explore the effects of gravity by holding up and releasing a variety of objects from a variety of heights and locations.</li> <li>• Describe the interaction that occurs between each object and the Earth.</li> <li>• Explore the effect of distance on the apparent brightness of the sun in relation to other stars.</li> </ul>	<ul style="list-style-type: none"> <li>• Why are some stars easier to see?</li> <li>• Why does our sun (a star) and stars appear to change position in the sky over time?</li> </ul>
<p><i>Unit 3: Enduring Understandings</i></p>	<ul style="list-style-type: none"> <li>• Natural objects vary in size, from very small to large.</li> <li>• Stars, which vary in size, also range greatly in their distance from the Earth.</li> <li>• The sun, which is also a star, is much, much closer to the Earth than any other star in the universe.</li> </ul>	<ul style="list-style-type: none"> <li>• What keeps people and objects on earth and why don't they just float away into space?</li> </ul>	

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<b>Curriculum Unit 3</b>	<b>Standards</b>		<b>Pacing</b>	
			<b>Days</b>	<b>Unit Days</b>
<b>Unit 3: Molecules to Organisms</b>	<b>5-ESS1-1</b>	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	20	45
	<b>5-ESS1-2</b>	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	20	
	Assessment, Re-teach and Extension		5	

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Unit 3 Grade 5

Disciplinary Core Ideas	Indicator #	Indicator
<p><b>ESS1.A: The Universe and its Stars</b>            The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)</p>	<p><b>5-ESS1-1</b></p>	<p>Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.</p>
<p><b>ESS1.B: Earth and the Solar System</b>            The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2)</p>	<p><b>5-ESS1-2</b></p>	<p>Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.</p>

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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

- Short Constructed Responses
- Investigative report where students investigate observable patterns of change that occur due to the position and motion of the Earth, sun, moon, and stars.
- The Noon Day Project: The Goal of the Noon Day Project is to have students measure the circumference of the earth using a method that was first used by Eratosthenes over 2000 years ago. Students at various sites around the world will measure shadows cast by a meter stick and compare their results. From this data students will be able to calculate the circumference of the earth.

**Resources**

**Activities**

- Chromebooks
- **HSP Science Book correlations:** 468-501  
<http://www.stem4students.net/fifth-grade---space-science-quarter-2.htm>
- The link to the Noon Day Project is as follows:  
<http://ciese.org/curriculum/noonday>
- <http://sciencenetlinks.com/afterschool-resources/falling-gravity/>
- [http://www.ehow.com/info\\_8407445\\_fifth-grade-gravity-projects.html](http://www.ehow.com/info_8407445_fifth-grade-gravity-projects.html)
- <http://www.physicsclassroom.com/Class/newtlaws/u2l1a.cfm>
- <http://www.physicsclassroom.com/Class/newtlaws/u2l3a.cfm>
- <http://www.physicsclassroom.com/Class/1DKin/U1L5b.cfm>
- **Diversity, Equity & Inclusion Educational Resources**  
<https://www.nj.gov/education/standards/dei/>

- Students will have the opportunity to make and record observations of the position of the sun in the sky at chosen intervals throughout the day and across a few days. Data should then be analyzed in order to describe the pattern observed.
- Student exploration of star brightness: 5th Grade Star Brightness.docx~ Students will support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. They will learn about different types of stars (Blue Dwarf, etc.). This document will provide guidance in conducting experiments.
- 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

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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.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
<p>All WIDA Can Do Descriptors can be found at this link:  <a href="https://wida.wisc.edu/teach/can-do/descriptors">https://wida.wisc.edu/teach/can-do/descriptors</a></p> <p><input type="checkbox"/> Grades 4-5 WIDA Can Do Descriptors:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Listening <input type="checkbox"/> Speaking</li> <li><input type="checkbox"/> Reading <input type="checkbox"/> Writing</li> <li><input type="checkbox"/> Oral Language</li> </ul> <p>Students will be provided with accommodations and modifications that may include:</p> <ul style="list-style-type: none"> <li>• Relate to and identify commonalities in science studies in student’s home country</li> <li>• Assist with organization</li> <li>• Use of computer</li> <li>• Emphasize/highlight key concepts</li> <li>• Teacher Modeling</li> <li>• Peer Modeling</li> <li>• Label Classroom Materials - Word Walls</li> </ul>	<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"> <li>• Raise levels of intellectual demands</li> <li>• Require higher order thinking, communication, and leadership skills</li> <li>• Differentiate content, process, or product according to student’s readiness, interests, and/or learning styles</li> <li>• Provide higher level texts</li> <li>• Expand use of open-ended, abstract questions</li> <li>• Critical and creative thinking activities that provide an emphasis on research and in-depth study</li> <li>• Enrichment Activities/Project-Based Learning/ Independent Study</li> </ul> <p>Additional Strategies may be located at the links:</p> <ul style="list-style-type: none"> <li>❖ <a href="#">Gifted Programming Standards</a></li> <li>❖ <a href="#">Webb’s Depth of Knowledge Levels and/or Revised Bloom’s Taxonomy</a></li> <li>❖ <a href="#">REVISED Bloom’s Taxonomy Action Verbs</a></li> </ul>



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**Interdisciplinary Connections**

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**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 ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ). 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 NJSL 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.