Grade 5

Unit 6: Patterns in the Sky

New Jersey Student Learning Standards
2024 - 2025

Established 2016-2017
Revised 2018-2019
Revised 2019-2020
Revised 2020-2021
Revised 2022-2023
Revised 2023-2024
Revised 2024-2025

Trimester	Unit Title	Recommended Instructional Days
3	Patterns in the Sky	49

NJSLS - Science: *TItle*	NJSLS - Science: *Performance Expectations*	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit**
5-ESS1 Earth's Place in the Universe	**5-PS2-1.** Support an argument that the gravitational force exerted by Earth on objects is directed down. **5-ESS1-1.** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. **5-ESS1-2**. 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.	
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary:** *Statement*	
PS2.B: Types of Interactions **ESS1.B: Earth and the Solar System** **ESS1.A: The Universe and its Stars**	• The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1) • 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	**Essential Question/s:** • How Does Gravity Affect Matter On Earth? • What Patterns Can Be Observed Over Time? • What Is The Sun? **Enduring Understanding:** • Explore gravity and the sun, including their effects on Earth's systems and matter. • Explore patterns in the night sky over time. • Gather evidence to explain the Earth's gravity pulls objects toward the planet's center.

	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) ● 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)	● Use evidence to support an argument that Earth is a sphere and that gravity causes falling objects to move towards Earth's center. ● Explore patterns observed over different time scales and caused by Earth's motion and its interactions with the sun and moon. ● Collect and analyze data to detect patterns, including path of the sun across the day sky, the movements of constellations in the night sky and hours of sunlight. ● Use models and gather evidence to support arguments that the sun is a star and appears larger and brighter than the stars due to its distance from Earth. **<u>Activity Description</u>**: **Lab Activities** ● *Unit Project - Starry Sky* - Students will explore patterns caused by Earth's revolution around the sun, collect and analyze observational data, and analyze data to reveal monthly and seasonal patterns. (SCI, TECH, MA, ELA) ● *Hands-On Activity 1 - An Ant's View of the World*: Earth's size makes it appear flat to people on its surface. (SCI, MA) ● *Hands-On Activity 2 - A Trip around the World*: Gravity affects objects on Earth's surface. (SCI) ● *Hands-On Activity 1 - Shadows*: The length and direction of a shadow changes throughout the day. (SCI, MA, ART) ● *Hands-On Activity 2 - The Night Moves:* Earth's revolution around the sun can explain patterns in the sky. (SCI) ● *Hands-On Activity 1 - Glowing Light*: Distance from Earth affects the apparent brightness of stars. (SCI, MA) ● *Hands-On Activity 2 - Color Provides the Final Clue:* Stars are bodies that emit light. (SCI, MA, ART) ● *You Solve It - Measuring Shadows* - Students will analyze data in a graph to reveal patterns in the length and direction of shadows over the course of one day. (SCI, TECH, MA) **Performance Task** ● *Solar Size* - Students design scale 3D models of stars to convey distance, brightness, and size. (SCI, TECH, ART)
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
Engaging in Argument from Evidence **Analyzing and Interpreting Data**	● Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ○ Support an argument with evidence, data, or a model. (5- ESS1-1) ● Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to	

<table>
<tr><td></td><td>collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.
○ Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)</td><td rowspan="5">Research Task
● Life in Space - Students learn about and research how astronauts deal with everyday activities in space. (SCI, ELA, TECH)

Career Education
● Astronomer - Students explore careers in science, focusing on astronomy and the study of space.

● Aerospace Engineer - Students find out what it takes to be an aerospace engineer

People in Science & Engineering: Dr. Beth Brown and Hibah Rahmani- Students will learn about Dr. Beth Brown an African-American astronomer, and Hibah Rahmani, a Pakistani-American engineer, who have had an impact on the study of space. (Amistad Law / Diversity & Inclusion)

Research Annie Jump Cannon, an astronomer and researcher of stars. She contracted scarlet fever; she was lucky to survive the devastating illness at all, but it cost her most of her hearing. Cannon was known for her speed at classifying the spectra of stars and reportedly classified more than 350,000 stars during her career. She also discovered more than 300 variable stars. (Diversity & Inclusion)

<u>Interdisciplinary Connections: Content: ;NJSLS#:</u>
ELA/Literacy
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS1-1)
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. (5-ESS1-1)
RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1)
RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS1-1)
W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-ESS1-1)</td></tr>
<tr><td>FOUNDATION
Crosscutting Concepts:
Core Idea</td><td>FOUNDATION
Crosscutting Concepts:
Statement</td></tr>
<tr><td>Cause and Effect

Patterns

Scale, Proportion, and Quantity</td><td>● Cause and effect relations are routinely identified, tested, and used to explain change. (5-PS2-1)
● Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5-ESS1-2)
● Natural objects exist from the very small to the immensely large. (5-ESS1-1)</td></tr>
<tr><td>Social and Emotional Learning:
Competencies</td><td>Social and Emotional Learning:
Sub-Competencies</td></tr>
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Self-Awareness **Self-Management** **Social Awareness** **Responsible Decision-Making** **Relationship Skills**	• Recognize one's feelings and thoughts • Recognize the impact of one's feelings and thoughts on one's own behavior • Recognize one's personal traits, strengths, and limitations • Recognize the importance of self-confidence in handling daily tasks and challenges • Understand and practice strategies for managing one's own emotions, thoughts, and behaviors • Recognize the skills needed to establish and achieve personal and educational goals • Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals. • Recognize and identify the thoughts, feelings, and perspectives of others • Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds • Demonstrate an understanding of the need for mutual respect when viewpoints differ • Demonstrate an awareness of the expectations for social	**SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- ESS1-2) ***Mathematics*** **MP.2** Reason abstractly and quantitatively. (5-ESS1-1),(5-ESS1-2) **MP.4** Model with mathematics. (5-ESS1-1),(5-ESS1-2) **5.NBT.A.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-ESS1-1) **5.G.A.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2)

	interactions in a variety of settings ● Develop, implement, and model effective problem-solving and critical thinking skills ● Identify the consequences associated with one's actions in order to make constructive choices ● Evaluate personal, ethical, safety, and civic impact of decisions ● Establish and maintain healthy relationships ● Utilize positive communication and social skills to interact effectively with others	

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: ● Diagnostic tests used to modify teaching and learning activities to improve student attainment (Unit Readiness Check, Lesson Quiz, Unit Test, Performance-Based Assessment)	**Benchmarks:** ● District Assessments **Summative Assessments:** ● End of unit / chapter test

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ML Core Resources**	**Gifted & Talented Core Resources**
● Evidence Notebook ● Equipment Kit ● FUNomental Readers	● FUNomental Readers ● Multilingual Glossary	● FUNomental Readers ● Multilingual Glossary ● Multilingual Home Letters	● FUNomental Readers

• Idea Organizer • Language Development Worksheet • Online Simulations • Into Science TE • Into Science SE • District Approved Resources			

Supplemental Resources

Technology:
- Chromebook
- SMARTBoard / Promethean Board
- District-Approved Resources

Ed Science Platforms:
- Digital Assessments
- Digital Performance Tasks
- You Solve It Simulation
- Student eBook
- Video-Based Projects
- Science Tools
- Online Glossary

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ML Core Resources**	**Gifted & Talented Core**
• Model how to identify vocabulary terms within text. Discuss how to locate definition within the text, noting that some definitions will need to	• Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations,	• Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an	• Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based

be inferred based on images as well as text.	additional examples, modeling, etc.), modify test content and/or format, allow students to retake tests for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	online bilingual dictionary, and modified assessment and/or rubric.	extension activities, and connect students to related talent development opportunities.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept:** Critical Thinking and Problem-solving	
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Performance Expectation/s:	• 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2). • 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1). • 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
	Career Readiness, Life Literacies, & Key Skills Practices	

	Students work in cooperative groups and will use research strategies to complete labs

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
X	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	X	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*