Unit 3: Structures and Properties of Matter

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

In this unit of study, students demonstrate an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of patterns, cause and effect, and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas. Students continue to develop an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of cause and effect and energy and matter are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations, designing solutions, and engaging in argument from evidence. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Enduring Understandings

Properties of matter (such as strength, hardness, flexibility and texture).
Certain materials are best suited for different purposes.
An object built out of a small set of pieces can be deconstructed and built into a different object.
Properties of solids, liquids, and gas.
Some substances can experience reversible changes and some cannot.

Essential Questions

How can you explain the structure, properties, and interactions of matter?
How do particles combine to form the variety of matter one observes?

Learning Objectives

Be able to identify material properties.
Be able to classify materials.
Be able to identify and explain the phases and changes of matter.
Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1)
Analyze data from tests of an object or tool to determine if it works as intended. (2- PS1-2)
Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
Construct an argument with evidence to support a claim.

Search for cause and effect relationships to explain natural events.

Standards: Content

K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
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.
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.
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.
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.
2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

Standards: Interdisciplinary

RI.CR.2.1	Ask and answer questions to demonstrate understanding of key details in an informational text, referring explicitly to the text as the basis for the answers.
RI.CI.2.2	Recount a text in oral and written form and determine main topic (in multi-paragraph informational text, focusing on specific paragraphs).
RI.IT.2.3	Describe the connection between a series of historical events, scientific ideas or concepts, or steps in a sequence within a text.
RI.TS.2.4	Describe the overall structure of a text and effectively use various text features (e.g., graphs, charts, images, captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information.
RI.PP.2.5	Identify the main purpose of a text, including what the author seeks to explore, answer, explain, or describe.
RI.MF.2.6	Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text.
RI.AA.2.7	Describe and identify the logical connections of how reasons support specific points the author makes in a text.
RI.CT.2.8	Compare and contrast two informational versions of the same idea or topic by different authors or authors from different cultures.
W.IW.2.2.A	Introduce a topic clearly.
W.IW.2.2.B	Develop a topic with facts definitions, concrete details, text evidence, or other information and examples related to the topic.
W.IW.2.2.C	Provide a conclusion.
SL.PE.2.1	Participate in collaborative conversations with diverse partners about grade 2 topics and

	texts with peers and adults in small and larger groups.
SL.PE.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.PE.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.
SL.PE.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.

Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	In correlation with the NGSS, students must demonstrate the following as summative assessments: 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. 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. Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, and vocabulary quizzes.
Alternative & Benchmark	Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes. Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials, Crayons, Scissors, Markers, Paper, Graph Paper, Rulers, Tape, Construction Paper. Second Grade Science Labs Structures of Matter Lab

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
X	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness		Relationship Skills
X	Responsible Decision-Making		Social Awareness
	Self-Management		

21st Century Skills & Themes

	Global and Cultural Awareness		Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
X	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		