02 Physical Science

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **1 Trimester**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students explore the properties of materials and matter! They describe and classify different types of materials by properties like hardness, flexibility, and absorbency, and they investigate how those properties are useful in meeting basic human needs (such as clothing and cooking). They also investigate how heating and cooling affect the properties of materials.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

How are materials similar and different from one another?

How do the properties of the materials relate to their use?

How can one explain the structure, properties, and interactions of matter?

How do substances combine or change (react) to make new substances?
How does one characterize and explain these reactions and make predictions about them?

CONTENT AREA STANDARDS

SCI.K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
SCI.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.
SCI.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-PS1-3	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-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

LA.RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
LA.RI.2.3	Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
LA.RI.2.8	Describe and identify the logical connections of how reasons support specific points the author makes in a text.
MA.2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
LA.W.2.1	Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a conclusion.
LA.W.2.7	Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
LA.W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
TECH.8.1.2.A.CS1	Understand and use technology systems.
TECH.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).
TECH.9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
TECH.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).
TECH.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).

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand:

- the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others.
- that the impacts of their decisions on others and the environment around them.
- that near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace.
- that they are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
- career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive.
- they make connections between abstract concepts with real-world applications, and they make correct

insights about when it is appropriate to apply the use of an academic skill in a workplace situation.

Procedural Knowledge

Students will be able to:

- plan an investigation to describe and classify different kinds of materials by their observable properties.
- conduct an investigation to describe and classify different kinds of materials by their observable properties.
- analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- 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.
- construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
- ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
- describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
- describe the logical connections of how reasons support specific points the author makes in a text.
- identify the logical connections of how reasons support specific points the author makes in a text.
- write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a conclusion.use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings
- participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations
- Recall information from experiences or gather information from provided sources to answer a question
- Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories
- Solve simple put together, take-apart, and compare problems using information presented in a bar graph

EVIDENCE OF LEARNING

Formative Assessments

- Whole-Class Conversations

- Turn and Talk Discussions
- Participation
- Lab Experiments
- Science Journal Pages and Drawings

Summative Assessments

Benchmark Assessments

- Multiple Choice Assessment administered at the end of each trimester (T1, T2, T3)

Alternative Assessments

- Oral Presentations
- Questions for Comprehension
- Performance Tasks
- Scientific Journals/Notebooks
- Self-Assessment
- WebQuests

RESOURCES (Instructional, Supplemental, Intervention Materials)

- Mystery Science
- https://mysteryscience.com/materials/material-properties
- Oobleck and Non-Newtonian Fluids
- Brainiac video on Non-Newtonian

INTERDISCIPLINARY CONNECTIONS

- Google
- Educational Tech Applications

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.