Wethersfield Public Schools
NGSS Unit Overview
Structures & Properties of Matter
Revised 2021-2022

Grade: 1st	**Topic:** Structures & Properties of Matter	**Time Frame/Duration:** 4-6 Weeks

Brief Unit Description:

Using a variety of resources and activities, students will start to develop an understanding of the different types of matter and how matter can be described and classified by its observable properties (e.g., visual, aural, textural), by its uses, and by whether it occurs naturally or is manufactured. Different properties are suited to different purposes. A great variety of objects can be built up from a small set of pieces (e.g., blocks, construction sets). Objects or samples of a substance can be weighed, and their size can be described and measured.

Primary Performance Expectation(s) -

Students who demonstrate understanding can:

2-PS1-1. **Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.** [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]

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.*** [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [*Assessment Boundary: Assessment of quantitative measurement is limited to length.*]

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.** [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]

2-PS1-4. **Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.** [Clarification Statement: 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, and heating paper.]

Looking Back:

Cause and Effect
Events have causes that generate observable patterns. [Grade K: Interdependent Relationships in Ecosystems (K-ESS3-3); Grade K: Weather & Climate (K-PS3-1),(K-PS3-2),(K-ESS3-2)]

Simple tests can be designed to gather evidence to support or refute student ideas about causes. [Grade K: Waves-Light & Sound (1-PS4-1),(1-PS4-2),(1-PS4-3)]

Patterns
Patterns in the natural and human designed world can be observed and used as evidence. [Grade K: Interdependent Relationships in Ecosystems (K-LS1-1)]
Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. [Grade K: Weather & Climate]

Looking Forward:
5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]

5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]

5-PS1-3. Make observations and measurements to identify materials based on their properties. [Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances

Learning Outcomes/ Hinge Ideas:

Different kinds of matter exist (e.g., wood, metal, water).

Temperature determines if something is a solid or liquid.

Matter can be described and classified by its observable properties (e.g., visual, aural, textural), by its uses, and by whether it occurs naturally or is manufactured.

Different properties are suited to different purposes.

Science & Engineering Practices:	**Disciplinary Core Ideas:**	**Crosscutting Concepts:**
1. Asking questions **2. Developing and using models** **3. Planning and carrying out investigations**	PS1.A: Structure and Properties of Matter ● Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature.	**Patterns** ● (2-PS1-2)Patterns in the natural and human designed world can be observed. (2-PS1-1) **Cause and Effect** ● Events have causes that generate observable patterns.

4. Analyzing and interpreting data 5. Using mathematics and computational thinking **6. Constructing explanations (for science)** **7. Engaging in argument from evidence** 8. Obtaining, evaluating, and communicating information	Matter can be described and classified by its observable properties. (2-PS1-1) ● 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) 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)	(2-PS1-4) ● Simple tests can be designed to gather evidence to support or refute student ideas about causes. **Energy and Matter** ● Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3) - ***Connections to Engineering, Technology, and Applications of Science*** Influence of Engineering, Technology, and Science, on Society and the Natural World ● Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (2-PS1-2)

Common Core State Standards Connections:

ELA/Literacy —

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. *(2-PS1-4)*

RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)

RI.2.8 Describe how reasons support specific points the author makes in a text. *(2-PS1-2)*,(2-PS1-4)

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 concluding statement or section. (2-PS1-4)

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). (2-PS1-1),(2-PS1-2),(2-PS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(2-PS1-3)

Mathematics —

MP.2 Reason abstractly and quantitatively. *(2-PS1-2)*

MP.4 Model with mathematics. *(2-PS1-1),(2-PS1-2).*

MP.5 Use appropriate tools strategically. *(2-PS1-2)*

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. *(2-PS1-1),(2-PS1-2)*

NGSS Resources **Vocabulary List** **Material List**

EPIC Books Collection
I Can Change Matter **Solid or Liquid** **Matter Comes in All Shapes**

PebbleGo
Science- Physical Science- Matter- What is Matter?
Science- Physical Science- Matter- Properties of Materials- Hot or Cold?
Science- Physical Science- Matter- Properties of Materials- Temperatures

Brainpop Jr.
Solids, Liquids, Gas
Physical and Chemical Changes (reversible/irreversible)
States of Matter (reversible/irreversible)

Structure and Properties of Matter- Sample Lessons

Better Lesson- Building Things in Different Ways

Real World Science **PBSlearningmedia.org**