

## Unit 2 Overview

**Unit Title:** Changes in Matter

**Grade Level:** 5

**Recommended Pacing:** 3 months – block scheduling

### **Unit Summary:**

Look around you. Perhaps you are sitting on a plastic chair in front of a wooden desk. You may have pencils and paper in front of you, or even a book. All of this is made of matter. Matter is all around you. The ground you walk on, the water you drink, and the air you breathe are all matter. In this unit you will read about what matter is made of. You will learn how different materials can be identified, and how different materials can change to become new materials.

### **NGSS:**

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.

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.

5-PS1-3. Make observations and measurements to identify materials based on their properties.

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

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

CCSS: ELA

R1.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

R1.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information

W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

CCSS: Math

5.MDA.1 Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real world problems.

5.MD.B.2 Make a line plot to display a data set of measurement in fraction of a unit. Use operations on fraction for this grade to solve problems involving information present in line plots.

**Unit 2 ISTE Standards:**

1. a-d Creativity and Innovation- Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes through technology.
2. a-d Communication and Collaboration- Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
3. a-d Research and Information Fluency- Students apply digital tools to gather, evaluate, and use information.
4. a-d Critical Thinking, Problem Solving, and Decision Making- Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

**Unit 2 Learning Targets**

***Students will be able to...***

- develop a model to describe a phenomenon that includes the idea that matter is made of particles too small to be seen. In the model, students identify the relevant components for the phenomenon, including: bulk matter and particles of matter that are too small to be seen

**Unit 2 Learning Targets**

***Students will do...***

- read for content mastery
- develop and use content related vocabulary

<ul style="list-style-type: none"> <li>● use the model to identify and describe relevant relationships between those components</li> <li>● use the model to describe how matter composed of tiny particles too small to be seen can account for observable phenomena (e.g., air inflating a basketball, ice melting into water)</li> <li>● measure and graph the given quantities using standard units, including: the weight of substances before they are heated, cooled, or mixed and the weight of substances, including any new substances produced by a reaction, after they are heated, cooled, or mixed</li> <li>● measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed</li> <li>● describe the changes in properties observed during and/or after heating, cooling, or mixing substances</li> <li>● use measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed</li> <li>● use measurements and descriptions of weight, as well as the assumption of consistent patterns in natural systems, to describe evidence to address scientific questions about the conservation of the amount of matter</li> <li>● from the given investigation plan, students identify the phenomenon under investigation, and identify the purpose</li> </ul>	<ul style="list-style-type: none"> <li>● cite specific textual evidence to support analysis of science and technical texts</li> <li>● complete a variety of laboratory activities to support the content</li> <li>● write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content</li> <li>● view various content related videos</li> <li>● discuss that matter is too small to be seen</li> <li>● explain that matter has mass and takes up space</li> <li>● use a balance to measure the mass of different objects</li> <li>● identify the various properties of matter, such as mass, Texture, hardness, elasticity, odor, magnetism, mass, And reaction to heat</li> <li>● describe the process of adding matter to an enclosed area and observing the physical and chemical changes</li> <li>● describe the process of mixing matter and observing the results of the interaction</li> </ul>
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<p>of the investigation, which includes collecting data to serve as the basis for evidence</p> <ul style="list-style-type: none"> <li>• from the given investigation plan, students describe the evidence from data that will be collected, including: properties of materials that can be used to identify those materials and describe how the observations and measurements will provide the data necessary to address the purpose of the investigation</li> <li>• from the given investigation plan, students describe how the data will be collected</li> <li>• collect and record data according to the given investigation plan</li> </ul>	<ul style="list-style-type: none"> <li>• prove that the total weight of matter remains constant when there is a change in property</li> <li>• explain the properties that are formed when two different substances are mixed together</li> <li>• identify and compare materials by their observable properties</li> </ul>
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Unit 2 Evidence of Learning	
<b>Formative Assessments:</b>	

- Associated tests and quizzes
- Exit tickets
- Student Interactive notebook
- Reading Challenges
- Lab work and engineering based projects
- Homework
- BrainPOP quizzes
- Participation: individual and group
- Acrostic poem

**Summative Assessments:**

- Associated tests and quizzes
- Lab work and engineering based projects

UNIT 2

**Lab Activities:**

- From Bring Science Alive! - Grade 5:
  - After observing and explaining a series of demonstrations, students will develop a model that describes matter as consisting of particles that are too small to be seen
  - Model a solid, liquid, gas, and mixture
  - Plan and carry out an investigation and mix together a variety of different substances; use their plan to identify which substances react together to form new substances
  - Measure and graph the weight of substances before and after a change to discover what happens to the weight of substances during different kinds of changes
  - Make glue from flour and water; use the engineering design process to identify what makes “good” glue
- Gizmos Labs: Phase Changes, Phases of Water, Solubility and Temperature, Density, Mineral ID, Mystery Powder Analysis
- Hydrogen Bubbles; Ice Cream in a Bag; Insta Snow kit; Chromatography: Why do leaves change color? with Leaf Color Chromatography - Bite Sci-zed You-tube video
- BETTERLESSON [www.betterlesson.com](http://www.betterlesson.com) States of Matter Part 1
- BETTERLESSON [www.betterlesson.com](http://www.betterlesson.com) Using Properties to Identify White Powders
- Evaporate salt water - <https://thewaterproject.org/resources/lesson-plans/evaporation-experiment/>; <http://www.education.com/pdf/earth-science> sun-dried/
- It’s a Solid...It’s a Liquid...It’s Oobleck - [www.scientificamerican.com/article/oobleck-bring-science-home/](http://www.scientificamerican.com/article/oobleck-bring-science-home/)

- Separating Mixtures - [www.education.com/pdf/separating-mixtures/](http://www.education.com/pdf/separating-mixtures/)
- Engineering a mobile launcher that is light, but strong: [www.nasa.gov/sites/default/files/files/LightButStrong\\_Web.pdf](http://www.nasa.gov/sites/default/files/files/LightButStrong_Web.pdf)

### Unit 2 Materials/Equipment:

#### **Required Lab Materials:**

Insta snow, milk, vanilla, rock salt, quart size zip-loc freezer bags, gallon size zip-loc freezer bags, sugar, ice balloons, balsa wood, bowls (paper), rulers, salt, spoons(plastic), yarn, baking powder, baking soda, beakers(250 mL), plastic bins, plastic medicine cups, droppers, flour, graduated cylinders(100 mL), hand lenses, iodine solution, plastic jars with lids, talc powder, vinegar, sandwich size plastic bags, calcium chloride, antacid tablets, balance, craft sticks, washers, safety glasses, white and blue construction paper, masking tape, paper towels, clear tape, whipping cream, rubbing alcohol, filter paper, straws, craft sticks

#### **Materials/Equipment/Resources:**

- Gizmos subscription, Quizlet subscription; Brainpop subscription
- Teachers Domain 5th grade video folder: Butter; Why Does Shrikwrap Shrink?; Color Symphony; Mystery Mud: Exploring Changes in States of Matter [www.nj.pbslearningmedia.org/favorites](http://www.nj.pbslearningmedia.org/favorites)
- Mr. Parr's science songs: 4 States of Matter
- TCI Bring Science Alive - Grade 5
- Smart Board, student Chromebooks



- Acrostic Poem: <http://www.readwritethink.org/files/resources/interacives/acrostic/>
- Scholastic Jams video and quiz on physical and chemical changes:  
<http://studyjams.scholastic.com/studyjams/jams/science/matter/changes-of-matter.htm>
- Scholastic Jams video on Solids, Liquids, and Gases:  
<http://studyjams.scholastic.com/studyjams/jams/science/matter/solids-liquids-gases.htm>
- Links to interactive activities on matter: physical and chemical changes:  
<http://interactivesites.weebly.com/matter-chemical--physical.html>
- Marie Curie: [www.biography.com/people/marie-curie-9263538](http://www.biography.com/people/marie-curie-9263538)
- Matter is Everywhere [www.readworks.org](http://www.readworks.org)
- Structure and Properties of Matter Teacher's Unit Guide:  
[www.mccracken.kyschools.us/.../5th%20Grade%20Structures%20and%20Properties%...](http://www.mccracken.kyschools.us/.../5th%20Grade%20Structures%20and%20Properties%...)
- NSTA Everyday Physical Science Mysteries book - The Cookie Dilemma (hook for Mystery Powders lab)

