

**CRM 2 Science Matters**

**Pacing**

- 20 days
- Sept.17-Oct. 12
- Weeks 4-7

**DESIRED RESULTS**

**Making Meaning**

The study of matter and energy can be used to explain and predict a large variety of phenomena. These concepts build a foundation for various strands of secondary science including: Atoms and Molecules, Conservation of Matter, States of Matter, and Chemical Reactions. In addition, understanding physical properties of matter helps students understand concepts in Earth, space, and life science.

The following make meaning valuable for learners and are investigated in this unit:

- Matter may be described by its physical properties (color, size, shape, mass, texture, flexibility, etc.) and the materials it is made of.
- Most objects are made of parts that work together and operate differently than the parts themselves.
- Some materials have similar properties, but also have distinct properties.
- Materials are made of particles that are too small to be seen without magnification.
- Heating and cooling cause changes to the properties of materials.
- Most substances can exist as a solid, liquid, or gas depending on the amount of heat energy.

**Transfer:** Students will use inquiry to investigate physical properties of matter and use these properties to describe and communicate their thinking. Students will be able to identify and categorize the typical states of matter (solid and liquid) according to similarities and differences. They will predict how heating and cooling can cause changes to matter. Students will use critical thinking skills and problem solving while working cooperatively to build structures that may have different properties than the materials they are made of.

**Enduring Understandings:**

- All matter can be measured, classified, and changed.
- Energy causes changes in the properties of matter.

**Essential Questions:**

- How do we describe and compare matter?
- What causes the properties of matter to change?

**Essential Vocabulary**

- change / cambiar
- combine/combinar
- cool/enfriar
- function/ función
- length/longitude
- liquid / líquido
- matter / materia
- melt / derretir
- mixture/mezcla
- parts/partes
- physical characteristics / características físicas
- physical properties / propiedades físicas

- predict/predecir
- properties/propiedades
- rigid/rígido
- rough/áspero
- size / tamaño
- smooth/liso
- solid/sólido
- state of matter / estado de la materia
- temperature / temperature
- texture/textura
- thermometer /termómetro

**Supporting Vocabulary Link**

- [Elementary School Supporting Vocabulary](#)

<p><b>Student Prerequisite Knowledge</b>  <i>Students should know:</i></p> <ul style="list-style-type: none"> <li>• matter can be classified in many different ways.</li> <li>• matter can be classified by its properties including relative size and mass, shape, color, and texture.</li> <li>• melting occurs when a solid is heated and changes to a liquid.</li> <li>• freezing occurs when a liquid is cooled and changes to a solid.</li> <li>• evaporation occurs when a liquid is heated and changes from a liquid to a gas.</li> <li>• matter changes states by adding and removing heat energy.</li> <li>• most of our heat energy on Earth comes from the Sun.</li> </ul>		
<p><b>Resources:</b> AISD Module Kit, Model Lesson Portfolio, FOSS: <a href="#">Solids and Liquids</a> Investigations, FOSS: <a href="#">Wood and Paper</a> Investigations, <a href="#">STEMscopes</a>, eBooks: Envisions Science Leveled Readers, Scott Foresman Text, <a href="#">Science Notebook Resources</a>, <a href="#">BrainPop Jr.</a>, <a href="#">Discovery Education</a>, <a href="#">Differentiation Strategies &amp; Resources</a></p>		
<p><b>ELPS:</b> Mandated by Texas Administrative Code (19 TAC §74.4), click on the link for <a href="#">English Language Proficiency Standards (ELPS)</a> to support English Language Learners.</p>		
<p><b>TEKS Knowledge &amp; Skills</b></p>	<p><b>Acquisition</b></p>	
<p>STAAR: RC = Reporting Category; DC = Dual Coded Skills; <b>Readiness Standard</b>; <b>Supporting Standard</b> Concepts are addressed in another unit.</p>	<p><b>Students Will Know</b></p>	<p><b>Students Will Be Able To</b></p>
<p>2.5: Matter and energy. The student knows that matter has physical properties and those properties determine how it is described, classified, changed, and used. The student is expected to:</p>		
<p>2.5A: classify matter by physical properties, including shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid;</p>	<ul style="list-style-type: none"> <li>• Different kinds of matter exist.</li> <li>• Solids and liquids have different properties which can be used to sort them.</li> <li>• The physical properties of matter can be observed and measured using tools such as a hand lens, balance, ruler, or beakers.</li> <li>• Solids always have a definite shape that does not change in various containers.</li> <li>• Liquids take the shape of their container or flow to the lowest part of a container.</li> <li>• There are many different kinds of solids and liquids, but certain characteristics are common for all solids and for all liquids.</li> </ul>	<ul style="list-style-type: none"> <li>• Observe and record properties of matter.</li> <li>• Observe and test properties of matter.</li> <li>• Compare matter to determine relative mass and temperature.</li> <li>• Describe, and classify matter by physical properties, including shape, relative mass, relative temperature, texture, and flexibility.</li> <li>• Classify matter by its state.</li> <li>• Describe the state of matter of a material and give evidence for classifying it as such.</li> </ul>
<p>2.5B: compare changes in materials caused by heating and cooling; RC1</p>	<ul style="list-style-type: none"> <li>• Heating and cooling matter can cause observable changes.</li> <li>• Some materials can be a solid or a liquid depending on their temperature (heat energy).</li> <li>• As a solid is heated, it will melt at a certain temperature.</li> <li>• As a liquid is cooled, it will freeze into a solid at a certain temperature.</li> <li>• Different types of matter change state at different temperatures.</li> </ul>	<ul style="list-style-type: none"> <li>• Determine the temperature of certain solids and liquids.</li> <li>• Observe changes that take place as matter cools or is heated.</li> <li>• Compare changes in matter caused by heating or cooling.</li> <li>• Describe what happens to change the state of matter.</li> </ul>

<p>2.5C: demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting RC1</p>	<ul style="list-style-type: none"> <li>Physical properties can be changed by cutting, folding, sanding, and melting and its mixtures to make decisions on how to use it.</li> </ul>	<ul style="list-style-type: none"> <li>Change the physical properties of matter by folding, cutting, sanding, and melting.</li> <li>Use before and after pictures (digital or drawn) to compare with the original and use them to describe the physical property that changes.</li> </ul>
<p>2.5D: combine materials that when put together can do things that they cannot do by themselves such as building a tower or a bridge and justify the selection of those materials based on their physical properties.</p>	<ul style="list-style-type: none"> <li>Materials are used in the real world based on their properties, and when combined, can add strength, flexibility, or other needed properties.</li> </ul>	<ul style="list-style-type: none"> <li>Combine materials to build a structure.</li> <li>Justify the selection of materials used to build a structure based on their physical properties.</li> </ul>

The study of science is taught through the lens of [Scientific Processes \(TEKS 2.1-2.4\)](#); therefore, these TEKS should be taught in conjunction with content throughout the year. Suggestions for TEKS to embed in each unit are provided in the Yearly Itinerary; however, the TEKS that can be addressed within a unit depends greatly on the learning activities in which students are engaged. Therefore, teachers must be deliberate in their choice of learning activities to ensure that all Scientific Processes TEKS are appropriately embedded within the course. In 2<sup>nd</sup> grade, districts are encouraged to facilitate laboratory and field investigations for at least 60% of instructional time.

**ASSESSMENT EVIDENCE**

**Student Work Products/Assessment Evidence**

Performance Tasks	Other Evidence (i.e. unit tests, open ended exams, quiz, essay, student work samples, observations, etc.)
<ul style="list-style-type: none"> <li>Investigations to explore and demonstrate physical properties of matter</li> <li>Investigations to explore and demonstrate properties of all solids and properties of all liquids</li> <li>In discussions students support claims as to whether a material is a solid or liquid giving evidence for their thinking.</li> <li>Melt an Ice Cube Investigation</li> <li><b>Suggested Dual Language Activity 1</b> Thermometer Lab: Students learn to use and read a thermometer with a buddy.</li> <li><b>Suggested Dual Language Activity 2</b> Full Inquiry Lab: Heating and Cooling Students use their knowledge of thermometers to track changes in temperature and write about patterns they found.</li> <li>Investigations to build a structure and justify the materials used</li> <li>Water &amp; Wood Lab</li> <li>Sinking Wood Lab</li> <li>Physical Changes Lab</li> <li>Folding Lab</li> <li>Paper &amp; Water Lab</li> </ul>	<p><b>Additional Suggestions for Assessment</b></p> <ul style="list-style-type: none"> <li>Observations, comparisons, and descriptions</li> <li>Science Notebook: Lab Notes and Conclusions</li> <li>Classification of solids by properties</li> <li>Classification of liquids by properties</li> <li>Solids/Liquids foldable</li> <li>Drawing and justification for use of materials in building structure</li> <li>FOSS: <a href="#">Solids and Liquids</a>, Student Sheet no. 2-3, 15</li> <li>Graphic organizer showing heating and cooling pictures</li> <li>Chart and mass measurements of wood</li> <li>Data and conclusions from data on water absorption</li> <li>Wood-Paper Foldable</li> <li>Teacher Observations: Use of safety rules and equipment</li> <li>Teacher Observations: Management and use of tools</li> </ul>

## LESSON PLANNING TOOLS

In the course of lesson planning, it is the expectation that teachers will include whole child considerations when planning such as differentiation, special education, English language learning, dual language, gifted and talented, social emotional learning, physical activity, and wellness.

### Model Lesson- [Properties of Matter](#)

- Properties of Solids
- Properties of Liquids & Comparing and Contrasting Solids & Liquids

Suggested Pacing: (5 days)

TEKS: 2.5A

### Model Lesson- [Heating and Cooling](#)

- Heating
- Cooling

Suggested Pacing: (5 days)

TEKS: 2.5B

### Model Lesson- [Changes in Physical Properties](#)

- Changing Wood

Suggested Pacing: (5 days)

TEKS: 2.5C

### Model Lesson- [Combining Materials](#)

- Combining Materials/Changing Paper

Suggested Pacing (5 days)

TEKS: 2.5D