

## 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 investigate mixtures.

## 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 of state/ cambio de estado
- compass/brújula
- condense / condenser
- density/densidad
- evaporates /se evapora
- condenses /se condensa
- function/ función
- liquid / liquid
- attract/atraer
- repel/repelar
- magnetic force/fuerza magnetic
- magnetism / magnetismo
- mass/masa
- matter/material
- mixture/mezcla
- particle/partícula
- physical change/cambio físico

- physical characteristics / propiedad física
- physical properties / propiedades físicas
- powder/polvo
- property /propiedad
- screen/tamiz
- sift/tamizar
- solid/sólido
- states of matter/estados de la material
- static electricity/electricidad estática
- temperature/temperature
- texture/textura
- volume/volumen
- water vapor/vapor de agua

## Supporting Vocabulary Link

- [Elementary School Supporting Vocabulary](#)

**Student Prerequisite Knowledge**

*Students should know:*

- different kinds of matter exist.
- Solids and liquids have different properties which can be used to sort them.
- the physical properties of matter can be observed and measured using tools such as a hand lens, balance, ruler, or beakers.
- solids always have a definite shape that does not change in various containers.
- liquids take the shape of their container or flow to the lowest part of a container.
- there are many different kinds of solids and liquids, but certain characteristics are common for all solids and for all liquids.
- heating and cooling matter can cause observable changes.
- some materials can be a solid or a liquid depending on their temperature (heat energy).
- as a solid is heated, it will melt at a certain temperature.
- as a liquid is cooled, it will freeze into a solid at a certain temperature.
- different types of matter change state at different temperatures.
- some physical properties of matter may be changed (size, shape, state) but the type of matter is unchanged.
- matter can be combined and may have properties the original matter does not have.

**Resources:** AISD Module Kit, Model Lesson Portfolio, FOSS *Solids and Liquids* Investigations, [STEMscopes](#), eBooks: Envisions Science Leveled Readers, Scott Foresman Text, [Science Notebook Resources](#), [BrainPop Jr.](#), [Discovery Education](#)

**ELPS:** Mandated by Texas Administrative Code (19 TAC §74.4), click on the link for [English Language Proficiency Standards \(ELPS\)](#) to support English Language Learners.

TEKS Knowledge & Skills	Acquisition	
STAAR: RC = Reporting Category; DC = Dual Coded Skills; <b>Readiness Standard</b> ; <b>Supporting Standard</b> Concepts are addressed in another unit.	Students Will Know	Students Will Be Able To
3.5: Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:		
3.5A: measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float.	<ul style="list-style-type: none"> <li>• Matter is something that takes up space and has mass.</li> <li>• Matter is classified, changed and used because of its properties.</li> <li>• Physical properties include mass, volume, magnetism, physical state, density and solubility in water.</li> <li>• Energy can change matter.</li> </ul>	<ul style="list-style-type: none"> <li>• Use tools and inquiry to observe, measure, test and record physical properties of objects and matter of various kinds and states.</li> <li>• Classify matter by physical properties of mass, magnetism, physical state, and density.</li> </ul>
3.5B: describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container.	<ul style="list-style-type: none"> <li>• Matter can be in a solid state, a liquid state, or a gaseous state.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe matter that is solid, liquid, and gas at room temperature.</li> <li>• Choose pictures/photos that show the three states of matter.</li> <li>• Classify matter in pictures, realia, and words into states.</li> </ul>

<p><b>3.5C: predict, observe, and record changes in the state of matter caused by heating or cooling.</b> RC1</p>	<ul style="list-style-type: none"> <li>• Changes in heat energy can cause matter to change state.</li> <li>• Adding enough heat energy to a solid so that it changes to a liquid is a process called melting.</li> <li>• Adding enough heat energy to a liquid so that it changes to a gas is called evaporation.</li> <li>• Evaporation of liquid water goes on constantly, even in cold places.</li> <li>• Water vapor returning to a liquid state is called condensation.</li> <li>• Almost every type of matter changes state (phase) when adding or taking away enough heat energy.</li> </ul>	<ul style="list-style-type: none"> <li>• Sort ideas to predict how solid water may change under different amounts of heat energy.</li> <li>• Predict the changes caused by heating and cooling.</li> <li>• Read a thermometer.</li> <li>• Plan and carry out an investigation on melting rate and explain results.</li> <li>• Plan and carry out an investigation on freezing rate and explain results.</li> </ul>
<p>3.5D: explore and recognize that a mixture is created when two materials are combined such as gravel and sand and metal and plastic paper clips.</p>	<ul style="list-style-type: none"> <li>• Different types of matter can be mixed together.</li> <li>• In some mixtures we can still observe the ingredients, and their physical properties do not change.</li> <li>• The volumes of ingredients might not add up when they make a mixture because there may be more space between particles of some ingredients.</li> <li>• The mass of each ingredient does add up when they make a mixture because there is not more or less material.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose the appropriate tools to measure matter.</li> <li>• Measure and compare volumes and masses of ingredients before and after mixing.</li> <li>• Design and evaluate some ways to test a mixture to find out more about its ingredients and properties.</li> <li>• Demonstrate that some mixtures maintain the physical properties of their ingredients.</li> <li>• Compare and contrast different mixtures by their physical properties.</li> <li>• Explore making and separating mixtures.</li> </ul>
<p>The study of science is taught through the lens of <a href="#">Scientific Processes (TEKS 3.1-3.4)</a>; 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 3<sup>rd</sup> grade, districts are encouraged to facilitate laboratory and field investigations for at least 60% of instructional time.</p>		

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.)
Properties of Matter Labs: <ul style="list-style-type: none"> <li>• Measuring Matter</li> <li>• Density</li> <li>• Magnetism</li> <li>• States of Matter</li> <li>• Changing States of Matter</li> <li>• Solids and Liquids Lab</li> <li>• Mixtures Lab</li> <li>• Liquids and Water Lab</li> </ul>	<b>Short Cycle Assessment</b> <ul style="list-style-type: none"> <li>• <i>SCA Testing Window: Oct. 15-19, 2012</i></li> <li>• <i>Tested TEKS: 3.5A, 3.5B, 3.5C, 3.5D</i></li> </ul> <b>Additional Suggestions for Assessment</b> <ul style="list-style-type: none"> <li>• Interactive Notebook Conclusions with Evidence and Justification</li> <li>• Properties of Matter Graphic Organizer</li> <li>• Foldable of solids/liquids/gases</li> <li>• Interactive Notebook entries: Water Cycle, students' reflections, vocabulary, observations, drawings, etc.</li> <li>• Teacher observations and student talk</li> <li>• Lesson Assessment TE p B3e-B3f /TE Assessment package pp 55-56</li> <li>• Chapter Assessment TE B3h /TE Assessment package pp 61-64</li> <li>• Data collected and recorded from the use of various science tools.</li> <li>• Inquiry Board questions</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 Matter
- Measuring Matter
- Measuring Density
- Measuring Magnetism

Suggested Pacing: (5 days)

TEKS: 3.5A

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

- States of Matter

Suggested Pacing: (5 days)

TEKS: 3.5B

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

- Changing States of Matter

Suggested Pacing: (5 days)

TEKS: 3.5C

### Model Lesson- [Mixtures and Solutions](#)

- Bits and Pieces
  - Solids in Containers
  - Separating Soup Mix
- Exploring Mixtures
  - Solids in Bottles
  - Separating a Mixture
- Exploring Solutions
  - Solids and Water

Suggested Pacing: (5 days)

TEKS: 3.5D