

CRM 2 Science Matters

Pacing

- 25 days
- Sept.10-Oct. 12
- Week 3-7

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 about similarities and differences in matter. Students will be able to identify and categorize the typical states of matter (solid, liquid and gas) according to similarities and differences. They will predict how heating and cooling can cause phase changes to matter. Students will use critical thinking skills and problem solving while working cooperatively to investigate mixtures and solutions.

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

- condensation / condensación
- density/densidad
- dimension/dimensión
- disperse/dispersar
- dissolve / disolver
- expand /expandir
- float/ flotar
- freezing point /punto de congelación
- function/ función
- Insulate/aislar
- magnetism / magnetismo
- matter/material
- measure/medida
- melting point / punto de fusión

- mixture/mezcla
- particle/partícula
- physical change/cambio físico
- powder/polvo
- sample/muestra
- screen/tamiz
- separate/separar
- shape of their container / forma de su recipiente
- solution/solución
- substance/ sustancia
- test /prueba
- volume/volumen
- water vapor/vapor de agua

Supporting Vocabulary Link

- [Elementary School Supporting Vocabulary](#)

Student Prerequisite Knowledge

Students should know:

- matter is something that takes up space and has mass.
- matter has properties that can be observed.
- magnetism is a property of some types of matter. Matter that is magnetic will be attracted to a magnet.
- common magnetic materials are iron and materials that contain iron, such as steel;
- we can measure physical properties of matter using scientific tools.
- we need to determine the intervals on scales in order to read them correctly.
- how well an object floats in water depends on its mass per unit volume, or density.
- the properties of size and floating of matter can be changed by forces like squeezing or tearing, but the type of matter does not change.
- matter can be in a solid state, a liquid state, or a gaseous state.
- changes in heat energy can cause matter to change state.
- adding enough heat energy to a solid so that it changes to a liquid is a process called melting.
- adding enough heat energy to a liquid so that it changes to a gas is called evaporation.
- evaporation of liquid water goes on constantly, even in cold places.
- when heat energy of 100°C is added to liquid water it begins to vaporize.
- water particles can stay in air until enough heat energy is removed that the vapor turns back to a liquid.
- water vapor returning to a liquid state is called condensation.
- almost every type of matter changes state (phase) when adding or taking away enough heat energy.
- the changing of solid, liquid, and gas states of water on Earth due to adding or removing heat energy is a pattern is called the water cycle
- different types of matter can be mixed together.
- in some mixtures we can still observe the ingredients, and their physical properties do not change.
- matter is made up of small particles.
- mixtures in which one material dissolves in another are called solutions.

Resources: AISD Module Kit, Model Lesson Portfolio, FOSS: *Mixtures and Solutions* Investigations, [STEMscopes](#), eBooks: Envisions Science Leveled Readers, Scott Foresman Text, [Science Notebook Resources](#), [BBC Online Labs, Quizzes, and Activities](#), [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; Readiness Standard ; Supporting Standard Concepts are addressed in another unit.	Students Will Know	Students Will Be Able To
5.5 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:		
5.5A: classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.	<ul style="list-style-type: none"> • Matter is something that takes up space and has mass. • Matter is classified, changed and used because of its properties. • Physical properties include mass, magnetism, physical state, density, solubility in water, conduction, and insulation. • We can measure physical properties of matter using scientific tools. • Matter that is magnetic will be attracted to a magnet. • Common magnetic materials are iron and materials that contain iron, such as steel. • Conduction and insulation relate to both thermal energy and electrical energy. • How well an object floats in water depends on its mass per unit volume, or density. 	<ul style="list-style-type: none"> • Decide and justify if examples describe “matter.” • Use tools and inquiry to observe, measure and record physical properties. • Classify matter by physical properties of mass, magnetism, physical state, density, solubility in water, conduction, insulation.
5.5B: identify the boiling and freezing/melting points of water on the Celsius scale	<ul style="list-style-type: none"> • The boiling point of water is 100° C. • The freezing/melting point of water is 0° C. • Melting is the reverse process of freezing. 	<ul style="list-style-type: none"> • Identify the boiling and freezing/melting points of water using metric thermometers.
5.5C: demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand.	<ul style="list-style-type: none"> • Some mixtures maintain physical properties of their ingredients (same mass, color, texture, magnetism...etc.). 	<ul style="list-style-type: none"> • Demonstrate that mixtures maintain the physical properties of their ingredients.
5.5D: identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.	<ul style="list-style-type: none"> • When ingredients of solutions combine, their physical properties can change. 	<ul style="list-style-type: none"> • Identify the changes that occur in the physical properties of ingredients of solutions.

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:

<p>3.5C: predict, observe, and record Changes in the state of matter caused by heating or cooling.</p>	<ul style="list-style-type: none"> • States of matter may change with the addition of reduction of heat energy. • Adding energy increases movement of the particles. 	<ul style="list-style-type: none"> • Predict the changes that might occur due to heating a solid or liquid. • Predict changes to matter in a gaseous or liquid state when cooled. • Organize data into a chart, table, or graph, then draw conclusions from the data.
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The study of science is taught through the lens of [Scientific Processes \(TEKS 5.1-5.4\)](#); 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 5th grade, districts are encouraged to facilitate laboratory and field investigations for at least 50% 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"> • Matter Properties Lab and checklist • Measuring Matter Labs and Lab Sheets and Mastery Demonstration • Magnetism, Heat, & Electricity Labs • Melting Inquiry Lab • Evaporation Lab • Soda Can Condensation Lab • Freezing Lab • Make and Separate Mixtures and Solutions Labs • Solubility Lab • Assessment Performance Lab 	<p>Short Cycle Assessment</p> <ul style="list-style-type: none"> • <i>SCA Testing Window: Oct. 15-19, 2012</i> • <i>Tested TEKS: 5.5A, 5.5B, 5.5C, 5.5D, 3.5C</i> <p>Additional Suggestions for Assessment</p> <ul style="list-style-type: none"> • Students' science notebook conclusions with evidence and justification • Properties of Matter Graphic Organizer • Foldable of Solids/liquids/gases • Water Cycle Interactive Notebook entries • Digital or drawn documentation of results • Mixtures & Solutions FOSS Student Sheets

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](#)

Observing & Classifying Matter

- BBC Online Activity- Characteristics of Materials
- Measuring Matter
- Density
- Magnetism
- Heat Conduction
- Electrical Conduction

Suggested Pacing: (10 days)

TEKS: 5.5A

Model Lesson- [Changing Matter Through Heating and Cooling](#)

- States Can Change

Suggested Pacing: (5 days)

TEKS: 5.5B, 3.5C

Model Lesson- [Mixtures and Solutions](#)

- Do Mixtures Maintain Their Properties?
- BBC Activity- Reversible and Irreversible Changes
- Making & Separating Special Mixtures
- Comparing Mixtures
- Short Cycle Assessment

Suggested Pacing: (10 days)

TEKS: 5.5C, 5.5D