

Highland Park Science Curriculum Third Grade

3rd 9 Weeks

Components	
Unit Name	Matter and Energy
TEKS	<p>(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to:</p> <p>(A) demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat; and</p> <p>(B) Make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics.</p> <p>(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:</p> <p>(A) plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;</p> <p>(B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data;</p> <p>(C) construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;</p> <p>(D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations;</p> <p>(E) demonstrate that repeated investigations may increase the reliability of results; and</p> <p>(F) Communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.</p> <p>(3) Scientific investigation and reasoning. The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:</p> <p>(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;</p> <p>(C) represent the natural world using models such as volcanoes or Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials; and</p> <p>(D) Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.</p> <p>(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:</p> <p>(A) collect, record, and analyze information using tools, including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, compasses, magnets, collecting nets, notebooks, sound recorders, and Sun, Earth, and Moon system models; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums; and</p>

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	<p>(B) Use safety equipment as appropriate, including safety goggles and gloves.</p> <p>Physical Science 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> <p>(A) 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</p> <p>(B) identify the boiling and freezing/melting points of water on the Celsius scale;</p> <p>(C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand; and</p> <p>(D) 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.</p>
<p>Generalizations/ Enduring Understandings</p>	<p>Matter is defined as anything that has mass and takes up space. No two pieces of matter can occupy the same space at the same time.</p> <p>All elements are made up of atoms.</p> <p>Mass is the amount of matter in an object.</p> <p>Weight is the measure of the force of gravity between an object and Earth.</p> <p>Solids have both a definite size and a definite shape.</p> <p>Liquids have a definite volume but not definite shape.</p> <p>Gases have neither a definite volume nor a definite shape but will expand to fill whatever container they are in.</p> <p>Changes in state of matter can be caused by heating and cooling.</p> <p>A mixture is created when two materials are combined. Examples- gravel, sand, metal, plastic paper clips</p> <p>Magnets are attracted to iron, cobalt, nickel, gadolinium, and steel.</p>
<p>Concepts</p>	<p>circumference, data, detect, diameter, length, mass, matter, measure, metric system, metric system, scale, solid, structure, substance, temperature (general), volume (matter), weight, beaker, mixture, systematic observations, classify, diameter, fluid, length, liquid</p>
<p>Guiding/ Essential Questions</p>	<ol style="list-style-type: none"> 1. What are the three states of matter? Compare and contrast them. 2. How are the five senses used in describing and classifying matter? 3. What are the molecular structures for the three states?

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	<ol style="list-style-type: none"> 4. How is mass measured? 5. How are mass and weight related? 6. How does gravity affect matter? 7. How can matter change? 8. Does air have mass and take up space? 9. Why are some objects attracted to magnets and some are not? 10. What is magnetism? 11. What tool is used to measure temperature? 12. How does change of temperature affect states of matter? 				
	<table border="1" style="width: 100%;"> <tr> <td style="width: 60%;">Progression Levels</td> <td></td> </tr> <tr> <td> <p>Students will understand and be able to classify the physical properties of matter. <i>Learning Target:</i> <i>Students will be able to predict and explore changes in different states of matter.</i></p> <p>ELA Connection: identify explicit cause and effect relationship among ideas in texts</p> </td> <td> <p>*identify the physical properties of matter ***odd one out *test and record physical properties of matter *describe and classify samples of matter *predict, observe, and record changes in the states of matter caused by heating and cooling; record in journal ***exit ticket *explore and recognize what a mixture is; oobleck (science lab) ***Four Corners Game with the states of matter</p> </td> </tr> </table>	Progression Levels		<p>Students will understand and be able to classify the physical properties of matter. <i>Learning Target:</i> <i>Students will be able to predict and explore changes in different states of matter.</i></p> <p>ELA Connection: identify explicit cause and effect relationship among ideas in texts</p>	<p>*identify the physical properties of matter ***odd one out *test and record physical properties of matter *describe and classify samples of matter *predict, observe, and record changes in the states of matter caused by heating and cooling; record in journal ***exit ticket *explore and recognize what a mixture is; oobleck (science lab) ***Four Corners Game with the states of matter</p>
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	Formative Assessments (for learning)				
	<p><u>Formative Assessment</u> <u>The Physical Properties of Matter Mobile</u> <u>The Physical Properties of Matter Mobile Scoring Guide</u></p> <p>Discovery Education Assessments:</p> <p>Properties of Matter: http://tools.discoveryeducation.com/assessment/viewAssessment.cfm?guidAssetID=3c826f21-1d8c-49ae-af34-ceed2eab08ba&blnPopup=1</p>				

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Formative/ Summative Assessment	<p>Ice Cubes in a Bag page 49 (Teacher Notes 50-54)</p> <p>Is it Matter? (Could be a Pre assessment) page 79 (Teacher Notes 80-84)</p> <p>Comparing Cubes? page 19 (Teacher Notes page 20-25)</p> <p>Floating High and Low page 33 (Teacher Notes page 34-39)</p> <p>Solids and Holes page 41 (Teacher Notes page 42-46)</p> <p>Freezing Ice page 59 (Teacher Notes page 60-64)</p> <p>What's in the Bubbles page 65 (Teacher Notes page 66-70)</p> <p>Floating Balloon page 39 (Teacher Notes page 40-44)</p>
Processes and Skills	<ol style="list-style-type: none"> 1. Collect information through measuring 2. Demonstrate safe practices 3. Analyze and interpret for reasonable conclusions. 4. Construct graphs, tables, and charts and record data 5. Observe 6. Infer 7. Communicate results 8. Hypothesize 9. Control variables
Topics	<p>Comparing Solids, Liquids, and Gases</p> <p>Building Blocks of Matter</p> <p>Heat</p> <p>Comparing and Contrasting the States of Matter Through Experimentation</p>
Facts	<p>All objects have mass and matter.</p> <p>Objects can be grouped and compared according to their properties.</p> <p>Matter normally exists as solid, liquid, or gas.</p> <p>Physical properties include color, temperature, texture, hardness, and magnetism, size, weight, and shape.</p> <p>Matter can change physically (stays the same type of matter).</p>

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Interactive Science Notebook	K-W-L
	<p>“No Laughing Matter”(for listing/classifying solids, liquids, and gases)—see form in teacher resource packet</p>
	What is the name of the tool used to measure temperature?
	How is temperature measured?
	How can a cup of hot chocolate be cooled in a hurry?
	What kinds of clothes would be packed for a vacation where the temperature was 7 degrees C?
	What kinds of clothes would be worn for 30 degrees C?
	Why is it important to know the temperature?
	How does a graduate help to measure volume of objects?
	Data collection
	Compare/Contrast chart
	What are some properties of matter?
	How does a solid behave?
	How does a liquid behave?
	How does a gas behave?
	What makes a magnet?
	Experiment format including hypothesis, materials, procedure, and conclusion
	What objects are attracted by magnets?
	Why are objects attracted to or repelled by magnets?
	What makes matter change from one state to the other?
	Does air have mass and take up space?

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	<p>Can the movement of molecules be observed?</p> <p>What are the advantages of having standard measurements for mass?</p>
Language of Instruction	<p>Volume, mass, properties, matter, solid, liquid, gas, mixture, evaporate, physical change Metal, magnetism, element, atom, compound, investigate, attract, energy, iron, cobalt, nickel, metal, heat, temperature, degree, insulator, thermometer, climate, expand, contract Standard unit of measurement, temperature, comparison, difference, mass, matter, space, properties, texture, five senses, recording, cause, effect, physical change, solids, liquids, gases, time lapse, molecule, elements</p>
Core Labs	<ul style="list-style-type: none"> • Spectroscope: Catch a Wave • Galactic Games – part 1 • Galactic Games – part 2 • Sun: UV Beads / Sun Print Paper/ Radiometer • Radiometer Investigations/ • Matter-Mixtures- Ooblek/Salt & Water • PASS Matter-Property Game-Engage • PASS-Open/Closed Mystery Cans- Explore • Weather Instruments: The 3rd Degree/The Cool Off
Core Lab Extensions	<p>Sun's Effect on Water Cycle We know that the sun is a star composed of gases, and the earth revolves around this center of our solar system. The Sun provide light and heat energy to Earth. Explain the Sun's role in Earth's water cycle.</p> <p>The educational video may be helpful. http://safari.hpsd.org/SAFARI/montage/play.php?keyindex=14401&location=local&chapterskeyindex=18222&play=1</p> <p>Sun, UV Beads/Sun Print Paper / Introduce Radiometer / Spectroscope: Catch a Wave Describe the sun. The educational video may be helpful. http://www.brainpopjr.com/science/space/sun/</p> <p>Radiometer Investigations During this week's lab, questions were created about the radiometer. Write a question, an investigation and any conclusion about it.</p> <p>Mixtures/Solutions How were the mixtures created? Use detailed description in at least three complete sentences. The attached link has many various activities about mixtures.</p>

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	<p>http://archive.fossweb.com/modules3-6/MixturesandSolutions/</p> <p>PASS Matter - Property Game – Engage What are the three states of matter? Describe the physical properties of the each. (An example for a solid is that it has a definite shape.) Add other data from the lab that helps us learn about properties of matter such as magnetism. The video may be helpful in responding. http://www.brainpopjr.com/science/matter/solidsliquidsandgases/</p> <p>PASS - Open/Closed Mystery Cans – Explore What are some physical properties of matter? Write at least six complete sentences. http://safari.hpsd.org/?a=224693&ch=4&d=28810AA.</p> <p>Thermometers and Graphing Weather Instruments: The 3rd Degree/The Cool Off How was matter changed by cooling? Write your answer in complete sentences. If you have time, respond appropriately to someone else's response. http://www.brainpopjr.com/math/measurement/temperature/</p>
Textbook Correlation	<p>Unit: Properties of Matter</p> <ul style="list-style-type: none"> • Measuring Matter- Every single item you touch, smell, and see is matter. All materials are made of matter. The gases released while cooking are matter. Even your body is made of matter! In this concept, you'll learn how to measure, observe, and classify matter. (Sessions 1-5) • Mixing Things- (Sessions 1-4) • Size and Shape- Everything you can see has a size and shape. In this concept, you'll learn about the particular sizes and shapes of solids, liquids, and gases. (Sessions 1-3)
In-depth Study/ Research Opportunity	<p>Matter http://www.chem4kids.com/</p>
Challenge/ Extension	<p>Reading Passage- What is Matter? http://goo.gl/ICrJBG Elaborate Section</p> <p>Elaborate- Mixtures http://goo.gl/SnFVWf</p> <p>Matter- Size and Shape-Elaborate Section http://goo.gl/80kLWj</p>
Health: Coordinated School Health Program	<p><i>Healthy and Wise: Elementary Online</i>; Monthly Newspaper- Sports, Exercise, Food, Health Research/Updates, Body Basics, Safety/Health Awareness, Relationships/Social/ Mental Health www.caprockpress.com</p> <p style="text-align: center;">Grade 3 Health Textbook http://www.macmillanmh.com/health/2005/student/level1.php?isbn=002280384X&st=tx</p>