



2nd Grade - Elementary Science Bundle # 9

Title			Suggested Dates
Properties of Objects and How Heat Affects Them			Feb 22 – March 11 (14 days)
Link to Integrated Process Skills	Link to Assessment	Link to Related Assurance Words	

Big Idea/Enduring Understanding	Guiding Questions
<p>Objects have observable physical properties that can be measured and changed by energy.</p> <p>We can classify objects based on their physical properties.</p> <p>Adding and removing heat can change objects physical properties.</p> <p>Combining objects based on their properties allows us to use them in different ways.</p>	<p>How can adding and removing heat change objects?</p> <p>How can we identify and classify objects based on their physical properties?</p> <p>How can we combine objects to do things they cannot do by themselves?</p> <p>How can we change physical properties without adding and removing heat?</p>

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
<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>	<p>Including:</p> <ul style="list-style-type: none"> • Shape • Relative mass (comparative) • Relative temperature (comparative) • Texture (use variety and build description words) • Flexibility • Solid or liquid <p>NOTE: focus is on the properties used to determine if something is a solid or liquid, not whether it IS a solid or liquid in terms of teaching “matter”</p> <p>Use a large variety of material for maximum experience</p>	<p>TAKScopes 2.5a Classifying Matter TAKScopes 2.5b Changes from Heat</p> <p><u>Bridging to TAKS: Light and Optics</u> 2nd Grade Lesson: “Units Matter” This lesson can be found in the Science Curr Information folder on each campus share folder.</p> <p><u>AIMS 2nd Grade Physical Science Texas Core Curriculum</u> “Texture Rough Texture Smooth, page 67 “Property Problems”, page 83</p> <p>BrainPopJr: “Solid, Liquids, and Gases (???)”</p> <p>United Streaming “Properties of Matter, Part 1” “Properties of Matter, Part 2: Liquids, Solids, and</p>

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		<p>Gases” “A First Look: Solids, Liquids, and Gases” (stop after “Melting and Freezing” segment) “Science Facts and Fun: Everything is Something”</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>2.5b compare changes in materials caused by heating and cooling</p>	<p>Including using a variety of materials to observe and compare the results of adding and removing heat.</p>	<p><u>SECO (State Energy Conservation Office) Lessons</u> “What Color Absorbs”</p> <p><u>AIMS 2nd Grade Physical Science Texas Core Curriculum</u> “Melting Pots”, page 137 “Melting Ice Cubes”, page 111 “Frosty Forms”, page 119</p> <p><u>Gateways: 2nd Grade</u> “Physical Properties”, page 16</p> <p><u>BrainPopJr:</u> <u>“Heat”</u></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>2.5c demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting</p>	<p>Students should experience changing physical properties using a variety of materials including but not limited to paper. The manipulation and changing should be purposeful.</p> <p>Including:</p> <ul style="list-style-type: none"> • Color change • Cutting • Folding • Sanding • Melting • Molding 	<p><u>AIMS 2nd Grade Physical Science Texas Core Curriculum</u> “The Ways Things Change”, page 109 “Gingerbread Cut-Outs”, page 29 “A Bears Eggs-pedition”, page 33 “Measuring Munchies”, page 47</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>2.5d 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>	<p>Including:</p> <ul style="list-style-type: none"> • Physical properties of materials that help them do new things when combined to create something else • Examples of systems / objects that are combination of items that do not function the same as if they were separated: <ul style="list-style-type: none"> ○ Brick walls without mortar ○ Lemonade without sugar ○ Cake without flour ○ Swings without the seat portion <p>NOTE: This applies to anything that is a mixture of other things</p>	<p><u>AIMS 2nd Grade Nature of Science Texas Core Curriculum</u> “Generating Gizmos”, page 197</p> <p><u>Ready Set Let's Dough! It's a Matter of a System</u></p>
Scientific Investigation and Reasoning		Back to Top
<p>2.1 Scientific investigation and reasoning. The student conducts classroom and outdoor</p>	<p>Emphasize safety when using heat. Students DO NOT use hot plates, but teachers may use them safety for demonstration</p>	<p>PISD Science Safety Page</p>

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<p>investigations following home and school safety procedures. The student is expected to:</p> <p>2.1a identify and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately</p> <p>2.1b describe the importance of safe practices</p> <p>2.1c identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal</p>	<p>purposes.</p> <p>Including:</p> <ul style="list-style-type: none"> • No tasting or touching unless instructed • Safe smelling – wafting • Goggles, as needed • Wait for teacher directions • No glassware • Students do not handle hot water, hot plates or burners. • Wash hands after science activities • Safe use of tools, such as scissors • Review investigation safety procedures <ul style="list-style-type: none"> ○ directly point out precautions, possible safety risks, specific guidelines for the lesson for both indoor and outdoor activities, as applicable. ○ encourage students to identify these on their own throughout the year [document in science notebooks via words and/or pictures] 	<p>Texas Science Safety Standards</p> <p>DuPont Science Safety Zone</p>
<p>2.2 Scientific investigation and reasoning. The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations. The student is expected to:</p> <p>2.2a ask questions about organisms, objects, and events during observations and investigations</p> <p>2.2b plan and conduct descriptive investigations such as how organisms grow</p> <p>2.2c collect data from observations using simple equipment such as hand lenses, primary balances, thermometers, and non-standard measurement tools</p> <p>2.2d record and organize data using pictures, numbers, and words</p> <p>2.2e communicate observations and justify explanations using student-generated data from simple descriptive investigations</p> <p>2.2f compare results of investigations with what students and scientists know about the world</p>	<p>Descriptive Investigation sample: What happens when heat is added to a wax crayon?</p> <p>Comparative Investigation sample: Which objects takes the longest amount of time to melt?</p> <p>Classroom Techniques:</p> <ul style="list-style-type: none"> • A minimum of 3 models / examples should be used enabling different modalities of learning • Teacher uses “think aloud” technique throughout the investigation • Use a variety of questions (both open and closed) • Both academic and informal science language should be used to develop appropriate vocabulary in context • Explicitly model the relationship between the question, materials, and steps in the investigation 	<p>What are descriptive, comparative, and experimental investigations?</p> <p>KLEW/ Claims & Evidence</p>
<p>2.3 Scientific investigation and reasoning. The</p>	<p>Practical problems such as:</p>	<p>Using Socratic Seminars for higher-order thinking</p>

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<p>student knows that information and critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:</p> <p>2.3a identify and explain a problem in his/her own words and propose a task and solution for the problem such as lack of water in a habitat</p> <p>2.3b make predictions based on observable patterns</p> <p>2.3c identify what a scientist is and explore what different scientists do</p>	<p>How do I pack my lunch / chocolate bar for the field trip so that it remains cold?</p> <p>Related Career examples:</p> <ul style="list-style-type: none"> • Physics teacher • Engineers • Chemist 	<p>and discussion</p> <p>Multisensory Strategies for Science Vocabulary by Sandra Husty and Julie Jackson includes Bag & Tag</p>
<p>2.4 Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world. The student is expected to:</p> <p>2.4a collect, record, and compare information using tools, including computers, hand lenses, rulers, primary balances, plastic beakers, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and stopwatches; weather instruments such as thermometers, wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums</p> <p>2.4b measure and compare organisms and objects using non-standard units that approximate metric units</p>	<p>Including:</p> <ul style="list-style-type: none"> • Hand lens • Notebooks • Primary balance • Plastic beaker • Goggles • Timing devices • Rulers & non-standard measurement units approximating metric units <p>Such as:</p> <ul style="list-style-type: none"> • Cameras • Computers 	

Related Assurance Words

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change (physical), classify, communicate, compare, demonstrate, dispose, measure, patterns, predict, temperature

Assessment

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Assessment Probes

Uncovering Student Ideas in Science, Vol. 1 (Page Keeley)

Ice Cubes in a Bag, page 49
 Cookie Crumble, page 61
 Objects and Temperature, page 109

Uncovering Student Ideas in Science, Vol. 2 (Page Keeley)

Comparing Cubes, page (can be converted into a performance Assessment)
 Ice-Cold Lemonade (tweak this), page

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Uncovering Student Ideas in Science, Vol. 3 (Page Keeley)

Is It a Solid, page 25

Thermometer, page 34