

# Alabama Standard Course of Study

(aligned with STARBASE lessons)



Alabama Standard Course of Study - ELA READING (5th Grade)	Objectives	Correlating DoD STARBASE Lesson	Correlating STARBASE Lesson Objective
10. [RI.5.1] Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.	Objectives: - ELA 5.10.1-4: Refer to details and examples, ask and answer questions to demonstrate understanding, identify and select the correct passage when responding to questions, and select the correct passage when responding to questions.	<b>STEM Careers: Personal Investigations</b>	<i>Personal Investigations</i> 1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.
11. [RI.5.2] Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.	Objectives: - ELA 5.11.1--3: Determine the main idea of a text and explain how it is supported by key details; summarize the text, and identify the main topic and retell key details of a text .	<b>STEM Careers: Personal Investigations</b>	<i>Personal Investigations</i> 1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.
13. [RI.5.4] Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a Grade 5 topic or subject area.	Objectives: - ELA 5.13.1--6: Determine the meaning of general academic and domain-specific words or phrases, ask and answer questions to help determine or clarify the meaning of words and phrases in a text, categorize objects and/or words, and sort objects and/or words from academic or domain specific words and phrases.	<b>All lessons apply to this standard</b>	See STARBASE Curriculum Standards
19. [RI.5.10] Read and comprehend informational texts, including history/social studies, science, and technical texts.A11	Objectives: - ELA 5.19.1--A82: Read and comprehend informational texts, including history/social studies, science, and technical texts with scaffolding as needed.	<b>STEM Careers: Personal Investigations</b>	<i>Personal Investigations</i> 1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.

<p>20. Know and apply grade-level phonics and word analysis skills in decoding words.</p>	<p>Objectives: - ELA 5.20.1--4: Define morphology and syllabication patterns, identify suffixes and prefixes, decode words with Latin suffixes/prefixes, Decode multisyllabic words, Read irregularly spelled words, Read regularly spelled words.</p>	<p><b>Energy: Physical and Chemical Changes</b></p>	<p><i>Energy</i></p> <ol style="list-style-type: none"> <li>1. The learner will understand that energy transfers in many ways, such as heat, light, electricity, mechanical motion, sound, and the nature of a chemical.</li> <li>2. The learner will conclude a change in the state of matter of a substance is the result of a change in kinetic energy.</li> <li>3. The learner will differentiate between a physical change in which matter changes state or form and a chemical change in which one or more new substances are formed.</li> <li>4. The learner will understand all energy can be classified as potential energy (such as chemical, mechanical, nuclear, and gravitational energy) or kinetic energy (such as radiant, thermal, motion, sound, and electrical energy).</li> </ol>
<p><b>Alabama Standard Course of Study - MATH (5th Grade)</b></p>	<p><b>Objectives</b></p>	<p><b>DoD STARBASE Lesson</b></p>	<p><b>STARBASE Lesson Objective</b></p>
<p>1. [5.OA.1] Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</p>	<p>Objectives: - M. 5.1.1--6: Define parentheses, braces, and brackets and numerical expressions, Recognize expressions, Apply properties of operations as strategies to add and subtract, Recall properties of operations, and Represent addition and subtraction with objects, mental images, drawings, expressions, or equations</p>	<p><b>Technology: Robotics Challenge</b></p>	<p><i>Technology:</i></p> <ol style="list-style-type: none"> <li>1. The learner will employ current and emerging technologies to solve a simulated or realworld problem.</li> <li>2. The learner will use multiple processes and diverse perspectives to explore alternative solutions</li> </ol>

<p>6. [5.NBT.3] Read, write, and compare decimals to thousandths using base-ten numerals, number names, and expanded form.</p> <p>- Compare two decimals to thousandths based on meanings of the digits in each place+A15.</p>	<p>Objectives:</p> <p>- M. 5.6.1--4: Recognize decimals as parts of a whole. Compare whole numbers. Read and Write whole numbers in words and expanded form .Define expanded notation and standard form.Convert a number written in expanded to standard form. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. Define hundredths and thousandths.Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits using &gt;, =, and &lt; symbols to record the results of comparisons. Identify comparison symbols.</p>	<p><b>Physics &amp; Chemistry:</b> <b>Newton's 2nd Law</b></p> <p><b>Technology: Robotics Challenge</b></p> <p><b>Mathematics: Fingerprint Analysis</b></p> <p><b>Mathematics: Engineering Measurement Training</b></p>	<p><i>Physics &amp; Chemistry</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize examples of motion and force in the physical world.</li> <li>2. The learner will demonstrate that an object in motion will stay in motion or an object at rest will stay at rest unless acted upon by an outside force. (Newton’s First Law)</li> <li>3. The learner will determine that acceleration is produced when a force acts on a mass. The greater the mass, the greater the amount of force necessary to accelerate the mass. (Newton’s Second Law)</li> <li>4. The learner will conclude every action is followed by a reaction equal in magnitude and opposite in direction. (Newton’s Third Law)</li> </ol> <p><i>Technology</i></p> <ol style="list-style-type: none"> <li>1. The learner will employ current and emerging technologies to solve a simulated or realworld problem.</li> <li>2. The learner will use multiple processes and diverse perspectives to explore alternative solutions</li> </ol> <p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</li> </ol>
<p>10. [5.NBT.7] Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used.</p>	<p>Objectives:</p> <p>- M. 5.10.1--9: Use decimal notation for fractions with denominators 10 or 100, Multiply and divide within 100 using properties of operations, Add and subtract within 1000 using strategies and algorithms, Apply properties of operations as strategies to multiply and divide, Explain why addition and subtraction strategies work, Identify place value as hundreds and Recall basic addition, subtraction, multiplication, and division fact</p>	<p><b>Fingerprint Analysis</b></p> <p><b>Eggbert</b></p>	<p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</li> </ol> <p><i>Engineering</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize the engineering design process is a method of problem solving used to create a system, a product, or a process that meets an identified need.</li> <li>2. The learner will apply the steps of the Engineering Design Process to solve a simulated or real-world problem.</li> </ol> <p><i>Engineering</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize the engineering design process is a method of problem solving used to create a system, a product, or a process that meets an identified need.</li> <li>2. The learner will apply the steps of the Engineering Design Process to solve a simulated or real-world problem.</li> </ol>

<p>11. [5.NF.1] Add and subtract fractions with unlike denominators (including mixed numbers)</p>	<p>Objectives:  - M. 5.11.1--10: Recall a fraction with a &gt; 1 as a sum of fractions, Recall addition and subtraction of fractions as joining and separating parts referring to the same whole, Decompose a fraction and Justify decompositions, using a visual fraction models. Add and subtract mixed numbers, Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.  Identify two fractions as equivalent, Recognize and generate simple equivalent fractions using visual models,  Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers, Compare fractions, and Recall basic math facts.</p>	<p><b>Mathematics: Fingerprint Analysis</b></p>	<p><i>Mathematics</i>  1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</p>
<p>13. [5.NF.3] Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, by using visual fraction models or equations to represent the problem.</p>	<p>Objectives:  - M. 5.13.1--6: Define mixed number. Recognize a fraction with a &gt; 1 as a sum of fractions. Identify that fraction is equivalent to fraction by using visual fraction models, Generate equivalent fractions. Recognize a fraction as a number on the number line and represent fractions on a number line diagram. Identify fraction as the quantity formed by 1 part when a whole.</p>	<p><b>Mathematics: Fingerprinting</b></p>	<p><i>Mathematics</i>  1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</p>

<p><b>14. [5.NF.4] Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</b></p> <p>- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</p>	<p>Objectives:</p> <p>- M. 5.14.1--2: Define proper fraction. Multiply fractions using denominators between 2 and 5. Identify proper and improper fractions. Recall basic multiplication facts. changing a whole number to a fraction. Partition a rectangle into rows and columns of same-size squares, and count to find the total number of them. Label the numerator and denominator of a fraction. Count the area squares for the length and width. Identify the width and length of a rectangle.</p>	<p><b>Mathematics: Engineering Measurement Training</b></p>	<p><i>Mathematics</i></p> <p>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</p>
<p><b>15. [5.NF.5] Interpret multiplication as scaling (resizing)</b></p> <p>- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.</p>	<p>Objectives:</p> <p>- M. 5.15.1--9: Define scaling and principle of fraction equivalence, Multiply a fraction by a whole number, Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify with visual modeling, Express whole numbers as fractions, and recognize fractions that are equivalent to whole number, Identify factor and product and B17Use comparison symbols.</p>	<p><b>Mathematics: Fingerprinting</b></p>	<p><i>Mathematics</i></p> <p>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</p>

<p>17. [5.NF.7] Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p> <ul style="list-style-type: none"> <li>- Interpret division of a unit fraction or whole number, and compute such quotients.</li> <li>- Solve real-world problems..</li> </ul>	<p>Objectives:</p> <ul style="list-style-type: none"> <li>- M. 5.17.1--3: Define quotient, Multiply a fraction by a whole number, Recognize key terms to solve word problems, Recall basic multiplication and division facts, Recognize multiples. Express whole numbers as fractions.</li> <li>Recognize fractions that are equivalent to whole numbers.</li> <li>Recall basic multiplication and division facts, Solve word problems involving multiplication of a fraction by a whole number, by using visual fraction models and equations to represent the problem. Recognize key terms to solve word problems and Recall basic multiplication and division facts.</li> </ul>	<p><b>Mathematics:</b> <b>Fingerprinting</b></p>	<p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</li> </ol>
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<p>18. [5.MD.1] Convert among different-sized standard measurement units within a given measurement system, and use these conversions+A19 in solving multistep, real-world problems.</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>- M. 5.18.1--6: Identify relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and hr, min, sec. Express measurements in a larger unit in terms of a smaller unit. Solve two-step word problems. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, by using drawings to represent the problem.</li> </ul>	<p><b>Physics &amp; Chemistry:</b>  <b>Newton's 2nd Law</b></p> <p><b>Energy: Physical and Chemical Changes</b></p> <p><b>Technology: Robotics Challenge</b></p> <p><b>Mathematics: Basic Measurement</b></p> <p><b>Mathematics: Engineering Measurement Training</b></p>	<p><i>Physics &amp; Chemistry</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize examples of motion and force in the physical world.</li> <li>2. The learner will demonstrate that an object in motion will stay in motion or an object at rest will stay at rest unless acted upon by an outside force. (Newton's First Law)</li> <li>3. The learner will determine that acceleration is produced when a force acts on a mass. The greater the mass, the greater the amount of force necessary to accelerate the mass. (Newton's Second Law)</li> <li>4. The learner will conclude every action is followed by a reaction equal in magnitude and opposite in direction. (Newton's Third Law)</li> </ol> <p><i>Energy</i></p> <ol style="list-style-type: none"> <li>1. The learner will understand that energy transfers in many ways, such as heat, light, electricity, mechanical motion, sound, and the nature of a chemical.</li> <li>2. The learner will conclude a change in the state of matter of a substance is the result of a change in kinetic energy.</li> <li>3. The learner will differentiate between a physical change in which matter changes state or form and a chemical change in which one or more new substances are formed.</li> <li>4. The learner will understand all energy can be classified as potential energy (such as chemical, mechanical, nuclear, and gravitational energy) or kinetic energy (such as radiant, thermal, motion, sound, and electrical energy).</li> </ol> <p><i>Technology</i></p> <ol style="list-style-type: none"> <li>1. The learner will employ current and emerging technologies to solve a simulated or realworld problem.</li> <li>2. The learner will use multiple processes and diverse</li> </ol>
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<p>19. [5.MD.2] Make a line plot to display a data set of measurements in fractions of a unit. Use operations on fractions for this grade to solve problems involving information presented in line plots. Given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</p>	<p>Objectives:  - M. 5.19.1--6: Make a line plot to display a data set of measurements in fractions of a unit. Solve problems involving addition and subtraction of fractions by using information presented in line plots. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. Draw a picture graph and a bar graph to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.</p>	<p><b>Basic Graphing</b></p>	<p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will collect data using observations and experiments.</li> <li>2. The learner will represent data using tables and graphs.</li> <li>3. The learner will collect and analyze data to identify solutions and/or make informed decisions.</li> </ol>
<p>20. [5.MD.3] Recognize volume as an attribute of solid figures, and understand concepts of volume measurement.</p>	<p>Objectives:  - M. 5.20ab.1--8: Define volume including the formulas <math>V = l \times w \times h</math>, and <math>V = B \times h</math>. Define solid figures &amp; unit cubes. Recognize that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize &amp; Draw examples of quadrilaterals, Describe attributes of 2D and 3D figures. Compare the unit size of volume/capacity in the metric system including milliliters and liters.</p>	<p><b>Mathematics: Engineering Measurement Training</b></p>	<p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</li> </ol>

<p>21. [5.MD.4] Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p>	<p><b>Objectives:</b>  - M. 5.21.1--7: Define cubic inches, centimeters, and feet. Compare the unit size of volume/capacity in the customary system including fluid ounces, cups, pints, quarts, gallons. Measure areas by counting unit squares. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving mass/volume. B22 Recall basic multiplication facts and Fluently add.</p>	<p><b>Physics &amp; Chemistry:</b>  <b>Newton's 2nd Law</b>   <b>Energy: Physical and Chemical Changes</b>   <b>Technology: Robotics Challenge</b>   <b>Mathematics: Basic Measurement</b>   <b>Mathematics: Engineering Measurement Training</b></p>	<p><i>Physics &amp; Chemistry</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize examples of motion and force in the physical world.</li> <li>2. The learner will demonstrate that an object in motion will stay in motion or an object at rest will stay at rest unless acted upon by an outside force. (Newton's First Law)</li> <li>3. The learner will determine that acceleration is produced when a force acts on a mass. The greater the mass, the greater the amount of force necessary to accelerate the mass. (Newton's Second Law)</li> <li>4. The learner will conclude every action is followed by a reaction equal in magnitude and opposite in direction. (Newton's Third Law)</li> </ol> <p><i>Energy</i></p> <ol style="list-style-type: none"> <li>1. The learner will understand that energy transfers in many ways, such as heat, light, electricity, mechanical motion, sound, and the nature of a chemical.</li> <li>2. The learner will conclude a change in the state of matter of a substance is the result of a change in kinetic energy.</li> <li>3. The learner will differentiate between a physical change in which matter changes state or form and a chemical change in which one or more new substances are formed.</li> <li>4. The learner will understand all energy can be classified as potential energy (such as chemical, mechanical, nuclear, and gravitational energy) or kinetic energy (such as radiant, thermal, motion, sound, and electrical energy).</li> </ol> <p><i>Technology</i></p> <ol style="list-style-type: none"> <li>1. The learner will employ current and emerging technologies to solve a simulated or realworld problem.</li> <li>2. The learner will use multiple processes and diverse</li> </ol>
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<p>22. [5.MD.5] Relate volume to the operations of multiplication and addition, and solve real world and mathematical problems involving volume.</p> <p>- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base.</p> <p>- Apply the formulas for rectangular prisms to find volume</p> <p>- Recognize volume as additive. Find volumes of solid figures.A23</p>	<p>Objectives:</p> <p>- M. 5.22.1--9: Define volume, Recognize angle measure. Solve addition and subtraction problems to find unknown angles on a diagram, Apply the area and perimeter formulas for rectangles, Solve real-world and mathematical problems involving perimeters of polygons.</p> <p>Recognize the formula for volume. Recall the attributes of 3D solids. Recall basic multiplication facts. Fluently add.</p> <p>Compare the unit size of volume/capacity in the metric system including milliliters and liters. Measure and estimate liquid volumes. Compare the unit size of volume/capacity in the metric system including milliliters and liters. Recognize the formula for volume. Describe attributes of 2D and 3D figures and Identify solid figures.</p>	<p><b>Energy: Physical and Chemical Changes</b></p> <p><b>Mathematics: Basic Measurement</b></p> <p><b>Mathematics: Engineering Measurement Training</b></p>	<p><i>Energy</i></p> <ol style="list-style-type: none"> <li>1. The learner will understand that energy transfers in many ways, such as heat, light, electricity, mechanical motion, sound, and the nature of a chemical.</li> <li>2. The learner will conclude a change in the state of matter of a substance is the result of a change in kinetic energy.</li> <li>3. The learner will differentiate between a physical change in which matter changes state or form and a chemical change in which one or more new substances are formed.</li> <li>4. The learner will understand all energy can be classified as potential energy (such as chemical, mechanical, nuclear, and gravitational energy) or kinetic energy (such as radiant, thermal, motion, sound, and electrical energy).</li> </ol> <p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will apply appropriate standard units and tools to measure length.</li> <li>2. The learner will apply appropriate standard units and tools to measure liquid volume.</li> <li>3. The learner will apply appropriate standard units and tools to measure mass.</li> </ol> <p><i>Mathematics</i></p> <ol style="list-style-type: none"> <li>1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.</li> </ol>
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<p>23. [5.G.1] Use a pair of perpendicular number lines, called axes, to define a coordinate system with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond.</p>	<p>Objectives:  - M. 5.23.1--8: Define ordered pair of numbers. Define x-axis, y-axis, and zero on a coordinate. Specify locations on the coordinate system. Illustrate vertical and horizontal number lines. Label x- and y-axis and zero on a coordinate. Locate negative &amp; positive numbers on the axis.</p>	<p><b>Mathematics: Fly On the Ceiling (Day 4)</b>  <b>Mathematics: Fingerprinting (Day 2)</b>  <b>Mathematics: Basic Graphing (Day 2)</b></p>	<p><i>Mathematics</i>  1. The learner will recognize geometric properties and relationships and apply them to other disciplines and to simulated or real-world problems.  <i>Mathematics</i>  1. The learner will solve problems using ratios expressed as a fraction, a decimal, or a percent.  <i>Mathematics</i>  1. The learner will collect data using observations and experiments.  2. The learner will represent data using tables and graphs.  3. The learner will collect and analyze data to identify solutions and/or make informed decisions.</p>
<p>24. [5.G.2] Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</p>	<p>Objectives:  - M. 5.24.1--5: Define ordered pair of numbers, quadrant one, coordinate plane, and plot points. Label the horizontal axis (x), vertical axis (y). Identify the x and y values in ordered pairs. Model writing ordered pairs.</p>	<p><b>Mathematics: Fly On the Ceiling</b></p>	<p><i>Mathematics</i>  1. The learner will recognize geometric properties and relationships and apply them to other disciplines and to simulated or real-world problems.</p>

<p>26. [5.G.4] Classify two-dimensional figures in a hierarchy based on properties.</p>	<p>Objectives: - M. 5.26.1--4: Define vertex/vertices and angle. Identify that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize and draw shapes having specified attributes such as a given number of angles or a given number of equal faces. Identify polygons based on the number of sides, angles, and vertices.</p>	<p><b>Technology: Robotics Challenge</b></p>	<p><i>Technology</i></p> <ol style="list-style-type: none"> <li>1. The learner will employ current and emerging technologies to solve a simulated or realworld problem.</li> <li>2. The learner will use multiple processes and diverse perspectives to explore alternative solutions</li> </ol>
<p><b>Alabama Standard Course of Study - SCIENCE (5th Grade)</b></p>	<p><b>Evidence of Student Attainment</b></p>	<p><b>DoD STARBASE Lesson</b></p>	<p><b>STARBASE Lesson Objective</b></p>
<p>3. Examine matter through observations and measurements to identify materials based on their properties.</p>	<p>Objectives: SCI.5.3.1--4: Define conductivity, solubility, density, buoyancy, reflectivity, and thermal conductivity. Compare and contrast different materials based on their identified properties. Classify substances based on their identified physical properties. Identify properties of matter that can be used to identify materials.</p>	<p><b>Physics &amp; Chemistry: Chromatography</b></p>	<p><i>Physics &amp; Chemistry:</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</li> <li>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</li> <li>3. The learner will recognize a substance has characteristics, such as density, viscosity, boiling point, and solubility, all of which are independent of the amount of the sample.</li> </ol>

<p>4. Investigate whether the mixing of two or more substances results in new substances (e.g., mixing of baking soda and vinegar resulting in the formation of a new substance, gas; mixing of sand and water resulting in no new substance being formed).</p>	<p><b>Objectives:</b>          SCI.5.4.1--4: Define physical changes, chemical changes, chemical reaction, solution, and mixture. Compare and contrast physical and chemical changes. Illustrate a chemical and a physical reaction. Identify examples of physical and chemical changes.</p>	<p><b>Energy: Physical and Chemical Changes</b></p> <p><b>Physics &amp; Chemistry: Chromatography</b></p>	<p><i>Energy:</i></p> <ol style="list-style-type: none"> <li>1. The learner will understand that energy transfers in many ways, such as heat, light, electricity, mechanical motion, sound, and the nature of a chemical.</li> <li>2. The learner will conclude a change in the state of matter of a substance is the result of a change in kinetic energy.</li> <li>3. The learner will differentiate between a physical change in which matter changes state or form and a chemical change in which one or more new substances are formed.</li> <li>4. The learner will understand all energy can be classified as potential energy (such as chemical, mechanical, nuclear, and gravitational energy) or kinetic energy (such as radiant, thermal, motion, sound, and electrical energy).</li> </ol> <p><i>Physics &amp; Chemistry:</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</li> <li>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</li> <li>3. The learner will recognize a substance has characteristics, such as density, viscosity, boiling point, and solubility, all of which are independent of the amount of the sample.</li> </ol>
<p>5. Construct explanations from observations to determine how the density of an object affects whether the object sinks or floats when placed in a liquid.</p>	<p><b>Objectives:</b>          SCI.5.5.1--4: Define mass, volume, density, and buoyancy. Measure the density of various objects. Explore different types of liquid to determine densities. Experiment to determine what types of objects float and which sink when placed in water.</p>	<p><b>Physics &amp; Chemistry: What's the Solution</b></p>	<p><i>Physics &amp; Chemistry:</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</li> <li>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</li> <li>3. The learner will recognize a substance has characteristics, such as density, viscosity, boiling point, and solubility, all of which are independent of the amount of the sample.</li> </ol>

<p>6. Construct an explanation from evidence to illustrate that the gravitational force exerted by Earth on objects is directed downward towards the center of Earth.</p>	<p><b>Objectives:</b>          SCI.5.6.1--4: Define gravitational force.          Summarize evidence to show gravitational forces on Earth.          Experiment to gather evidence to support gravitational pull.          Observe the force of gravity by dropping various objects.</p>	<p><b>Physics &amp; Chemistry:</b>  <b>Newton's Activities</b></p>	<p><i>Physics &amp; Chemistry:</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize examples of motion and force in the physical world.</li> <li>2. The learner will demonstrate that an object in motion will stay in motion or an object at rest will stay at rest unless acted upon by an outside force. (Newton's First Law)</li> <li>3. The learner will determine that acceleration is produced when a force acts on a mass. The greater the mass, the greater the amount of force necessary to accelerate the mass. (Newton's Second Law)</li> <li>4. The learner will conclude every action is followed by a reaction equal in magnitude and opposite in direction. (Newton's Third Law)</li> </ol>
<p>7. Design and conduct a test to modify the speed of a falling object due to gravity (e.g., constructing a parachute to keep an attached object from breaking).*</p>	<p><b>Objectives:</b>          SCI.5.7.1--5: Define speed, friction, and air resistance.          Create, test, and evaluate a prototype solving the problem of modifying the speed of a falling object due to gravity.          Record the speed of an object dropped from different heights on a graph. Research to develop possible solutions and devise a plan to the problem of modifying the speed of a falling object due to gravity. B33Define a problem to be solved by modifying the speed of a falling object due to gravity.</p>	<p><b>Physics &amp; Chemistry:</b>  <b>Newton's Activities</b></p>	<p><i>Physics &amp; Chemistry:</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize examples of motion and force in the physical world.</li> <li>2. The learner will demonstrate that an object in motion will stay in motion or an object at rest will stay at rest unless acted upon by an outside force. (Newton's First Law)</li> <li>3. The learner will determine that acceleration is produced when a force acts on a mass. The greater the mass, the greater the amount of force necessary to accelerate the mass. (Newton's Second Law)</li> <li>4. The learner will conclude every action is followed by a reaction equal in magnitude and opposite in direction. (Newton's Third Law)</li> </ol>
<p><b>Alabama Standard Course of Study - ELA WRITING (5th Grade)</b></p>	<p><b>Objectives</b></p>	<p><b>DoD STARBASE Lesson</b></p>	<p><b>STARBASE Lesson Objective</b></p>

<p>29. [W.5.8] Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.</p>	<p><b>Objectives:</b>  - ELA 5.29.1--8: Define relevant information, note-taking, source, and paraphrase. Use note-taking skills to gather and paraphrase ideas from sources related to topic.  With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. Produce a list of sources using correct format. Identify captions, illustrations, tables, and photographs to extend meaning of written text. Select the appropriate source of information pertaining to the research topic. Locate bold-faced and italicized words to identify essential information.  List key concepts from texts.</p>	<p><b>STEM Careers: Personal Investigations</b></p>	<p><i>Personal Investigations</i>  1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.</p>
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<p>31. [W.5.10] Write routinely over extended time frames, including time for research, reflection, and revision, and shorter time frames such as a single sitting or a day or two for a range of discipline-specific tasks, purposes, and audiences.</p>	<p><b>Objectives:</b>  - ELA 5.31.1--7: Write in journals following teacher guidelines. Examples: subject journals, story starters, open-ended questions. Write words and sentences legibly with proper spacing. Write using varied sentence structure and appropriate transition words. Write complete sentences using correct capitalization, punctuation, spelling, and grammar. Determine purpose and audience prior to writing. Participate in guided writing with anchor charts &amp; teacher modeling. Participate in shared writing language experience stories.</p>	<p><b>STEM Careers: Personal Investigations</b></p> <p><b>Engineering: Introduction to the Engineering Design Process</b></p> <p><b>Energy: States of Matter</b></p> <p><b>Physics &amp; Chemistry: Chromatography</b></p> <p><b>Physics &amp; Chemistry: Newton's Laws</b></p> <p><b>Physics &amp; Chemistry: Bernoulli's Principle Experiments</b></p>	<p><i>Personal Investigations</i></p> <ol style="list-style-type: none"> <li>1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.</li> </ol> <p><i>Engineering</i></p> <ol style="list-style-type: none"> <li>1. The learner will recognize the engineering design process is a method of problem solving used to create a system, a product, or a process that meets an identified need.</li> <li>2. The learner will apply the steps of the Engineering Design Process to solve a simulated or real-world problem.</li> </ol> <p><i>Energy</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude that energy in a system is conserved and may change from one form to another.</li> <li>2. The learner will conclude a change in the state of matter of a substance is the result of a change in kinetic energy.</li> <li>3. The learner will differentiate between a physical change in which matter changes state or form and a chemical change in which one or more new substances are formed.</li> <li>4. The learner will understand all energy can be classified as potential energy (such as chemical, mechanical, nuclear, and gravitational energy) or kinetic energy (such as radiant, thermal, motion, sound, and electrical energy).</li> </ol> <p><i>Physics &amp; Chemistry</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</li> <li>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</li> <li>3. The learner will recognize a substance has characteristics,</li> </ol>
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<p>32. [SL.5.1] Engage effectively in a range of collaborative discussions with diverse partners, building on others' ideas and expressing their own clearly.</p> <p>- Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.- Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.</p>	<p>Objectives:</p> <p>- ELA 5.32.1--8: Build on others' talk in conversations by responding to the comments of others through multiple exchanges. Demonstrate eye contact, articulation, and appropriate voice intonation with oral presentations. Demonstrate appropriate volume and expression when speaking aloud in a group setting. Select appropriate voice tone, gestures, and facial expressions to enhance meaning. Utilize precise vocabulary in oral presentations. Produce complete sentences when appropriate in spoken language. Reproduce appropriate turn-taking skills in conversations. Listen to speaker without interruption.</p>	<p><b>All lessons apply to this standard</b></p>	<p>See STARBASE Curriculum Standards</p>
<p>33. [SL.5.2] Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</p>	<p><b>- ELA 5.33.3--7: Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.Ask and answer questions about key details in a text read aloud or information presented orally or through other media. Locate captions, illustrations, tables, and photographs to extend meaning of written text. Identify key concepts from the texts.B38 Follow multi-step directions.</b></p>	<p><b>STEM Careers: Personal Investigations</b></p> <p><b>Engineering: Basic Measurement - Length, Liquid Volume, Mass</b></p> <p><b>Physics &amp; Chemistry: Chromatography</b></p>	<p><i>Personal Investigations</i></p> <p>1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.</p> <p><i>Mathematics</i></p> <p>1. The learner will apply appropriate standard units and tools to measure length.</p> <p>2. The learner will apply appropriate standard units and tools to measure liquid volume.</p> <p>3. The learner will apply appropriate standard units and tools to measure mass.</p> <p><i>Physics &amp; Chemistry</i></p> <p>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</p> <p>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</p> <p>3. The learner will recognize a substance has characteristics, such as density, viscosity, boiling point, and solubility, all of which are independent of the amount of the sample.</p>

<p>34. [SL.5.3] Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.</p>	<p>Objectives:  - ELA 5.34.1--5: Define question and elaboration. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.  Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.  Ask and answer questions about a story read aloud in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.  Use appropriate grammar. Produce complete sentences when appropriate in spoken language. Reproduce appropriate turn-taking skills in conversations and discussions. Listen to speaker without interruption.</p>	<p><b>STEM Careers: STEM Careers on Military Facilities</b></p>	<p><i>STEM Careers:</i>  The learner will develop an awareness that scientists, technicians, engineers and mathematicians work on military facilities.</p>
<p>35. [SL.5.4] Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.</p>	<p>Objectives:  - ELA 5.35.1--5: Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences. Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly. Produce complete sentences.  Use appropriate grammar and vocabulary. Use eye contact, articulation, and appropriate tone of voice.</p>	<p><b>STEM Careers: Personal Investigations</b></p>	<p><i>Personal Investigations</i>  1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.</p>
<p>38. [L.5.1] Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.  - Use verb tense to convey various times, sequences, states, and conditions.  - Recognize and correct inappropriate shifts in verb tense.</p>	<p>Objectives:  - ELA 5.38.1--7: Use relative pronouns and relative adverbs. Form and use the progressive. Use modal auxiliaries :  Order adjectives within sentences according to conventional pattern. Form and use prepositional phrases. Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.  Correctly use frequently confused words.</p>	<p><b>All lessons apply to this standard</b></p>	<p>See STARBASE Curriculum Standards</p>

<p>41. [L.5.4] Determine or clarify the meaning of unknown and multiple-meaning words and phrases</p> <ul style="list-style-type: none"> <li>- Use context clues and common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., photograph, photosynthesis).</li> <li>- Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.</li> </ul>	<p>Objectives:</p> <ul style="list-style-type: none"> <li>- ELA 5.41.1-5 Define multiple-meaning words, strategies, affixes, root, thesaurus, and glossary.</li> </ul> <p>Use sentence-level context as a clue to the meaning of a word or phrase. Determine the meaning of the new word formed when a known affix is added to a known word. Use a known root word as a clue to the meaning of an unknown word with the same root. Use glossaries or beginning dictionaries, both print and digital, to determine or clarify the precise meaning of key words and phrases.</p>	<p><b>STEM Careers: Personal Investigations</b></p> <p><b>Physics &amp; Chemistry: Chromatography</b></p> <p><b>Physics &amp; Chemistry: What's the Solution</b></p>	<p><i>Personal Investigations</i></p> <ol style="list-style-type: none"> <li>1. The learner will correlate their academic endeavors in STEM areas to real-world applications in career fields.</li> </ol> <p><i>Physics &amp; Chemistry</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</li> <li>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</li> <li>3. The learner will recognize a substance has characteristics, such as density, viscosity, boiling point, and solubility, all of which are independent of the amount of the sample.</li> </ol> <p><i>Physics &amp; Chemistry</i></p> <ol style="list-style-type: none"> <li>1. The learner will conclude there are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for all living and non-living substances.</li> <li>2. The learner will demonstrate that atoms combine to form molecules and molecules formed from different atoms combine to form compounds.</li> <li>3. The learner will recognize a substance has characteristics, such as density, viscosity, boiling point, and solubility, all of which are independent of the amount of the sample.</li> </ol>
<p>43. [L.5.6] Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).</p>	<p>Objectives:</p> <ul style="list-style-type: none"> <li>- ELA 5.43.1--6: Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including spatial and temporal relationships. Use subject-related words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions.</li> </ul>	<p><b>All lessons apply to this standard</b></p>	<p>See STARBASE Curriculum Standards</p>