5th Grade Crosswalk: Oklahoma Academic Science Standards				*Topics from: National Science Education Standards (NSES) National Council of Teachers of Mathematics (NCTM) International Society of Technology in Education (ISTE)
March 2019				
Science & Engineering Practices	**TOPIC**	**PERFORMANCE EXPECTATIONS**	**DOD STARBASE LESSON PLANS**	
Develop a model to describe phenomena.	Matter and Its Interactions	5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.	Building Blocks of Matter: Creating and Building Molecular Models	-Properties and Changes of Properties in Matter (NSES)
Measure and graph quantities such as weight to address scientific and engineering questions and problems.		5-PS1-2 Measure and graph quantities to provide evidence that, regardless of the type of change that offers when heating, cooling, or mixing substances, the total weight of matter is conserved.	Data Analysis: Basic Graphing	-Develop fluency in adding, subtracting, multiplying, and dividing whole numbers. (NCTM) -Represent and analyze patterns and functions using words, tables, and graphs. (NCTM) -Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions. (NCTM) -Investigate how a change in one variable relates to a change in a second variable. (NCTM) -Collect data using observations, surveys, and experiments. (NCTM) -Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. (NCTM)
			States of Matter Experiments Physical and Chemical Changes Experiments	-Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)

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Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.	Matter and Its Interactions	5-PS1-3 Make observations and measurements to identify materials based on their properties.	Basic Measurement: Length, Liquid Volume, and Mass Physical and Chemical Changes Experiments	-Understand measurable attributes of objects and the units, systems, and processes of measurement. (NCTM) -Apply appropriate techniques, tools, and formulas to determine measurement. (NCTM) -Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)
Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.		5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Physical and Chemical Changes Experiments Building Blocks of Matter: Chromatography Introduction to the Engineering Design Process Engineering Design Process: Eggbert	-Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES) -Properties and Changes of Properties in Matter (NSES) -Critical Thinking, Problem Solving, and Decision Making (ISTE) -Science & Technology in Society (NSES) -Solve problems that arise in mathematics and in other contexts. (NCTM) -Apply and adapt a variety of appropriate strategies to solve problems. (NCTM) -Develop fluency in adding, subtracting, multiplying, and dividing whole numbers. (NCTM) -Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools. (NCTM)

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Support an argument with evidence, data, or a model.	Motion and Stability: Forces and Interactions	5-PS2-1 Support an argument that the gravitational force exerted by the Earth is directed down.	Introduction to Motion and Force: Newton's Laws of Motion Rocketry Introduction Straw Rockets Fluid Mechanics: Bernoulli's Principle Experiments	-Motions and Forces (NSES) -Investigate how a change in one variable relates to a change in a second variable. (NCTM) -Identify and describe situations with constant or varying rates of change and compare them. (NCTM) -Collect data using observations, surveys, and experiments. (NCTM) -Represent data using tables and graphs such as line plots, bar graphs, and line graphs. (NCTM) -Predict the probability of outcomes of simple experiments and test the predictions. (NCTM) -Structure of the Earth System (NSES) -Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and when possible, symbolic rules. (NCTM) -Solve problems involving scale factors, using ratio and proportion. (NCTM)
Use models to describe phenomena.	Energy	5-PS3-1 Use models to describe that energy in animal's food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	Energy Explorations	-Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)

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Support an argument with evidence, data, or a model.	From Molecules to Organisms: Structure and Processes	5-LS1-1 Support an argument that plants get the materials they need for growth chiefly from air & water.	Building Blocks of Matter: Creating and Building Molecular Models	Properties and Changes of Properties in Matter (NSES)
Develop a model to describe phenomena.	Ecosystems: Interactions, Energy, and Dynamics	5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Building Blocks of Matter: Creating and Building Molecular Models Energy Explorations States of Matter Experiments	-Properties and Changes of Properties in Matter (NSES) -Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)
		5-LS2-2 Use models to explain factors that upset the stability of local ecosystems.	Energy Explorations	-Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)

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Support an argument with evidence, data, or a model.	Earth's Place in the Universe	5-ESS1-1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.	Basic Measurement: Length Energy Explorations	-Understand measurable attributes of objects and the units, systems, and processes of measurement. (NCTM) -Apply appropriate techniques, tools, and formulas to determine measurement. (NCTM) -Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)

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Represent data in graphical displays (bar graphs, pictographs, and/or pie charts) to reveal patterns.	Earth's Place in the Universe (continued)	5-ESS1-2 Represent data in graphical displays to reveal patters of daily changes in length & direction of shadows, day & night, and the seasonal appearance of some stars in the night sky.	Data Analysis: Basic Graphing Data Analysis: Rocket Launch Straw Rockets Introduction to Navigation and Mapping: Top Secret Mission	-Develop fluency in adding, subtracting, multiplying, and dividing whole numbers. (NCTM) -Represent and analyze patterns and functions using words, tables, and graphs. (NCTM) -Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions. (NCTM) -Investigate how a change in one variable relates to a change in a second variable. (NCTM) -Collect data using observations, surveys, and experiments. (NCTM) -Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. (NCTM) -Motions and Forces (NSES) -Investigate how a change in one variable relates to a change in a second variable. (NCTM) -Identify and describe situations with constant or varying rates of change and compare them. (NCTM) -Collect data using observations, surveys, and experiments. (NCTM) -Represent data using tables and graphs such as line plots, bar graphs, and line graphs. (NCTM) -Predict the probability of outcomes of simple experiments and test the predictions. (NCTM) -Critical Thinking, Problem Solving, and Decision Making (ISTE) -Science & Technology in Society (NSES)

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Develop a model using an example to describe phenomena.	Earth's Systems	5-ESS2-1 Develop a model to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	States of Matter Experiments	-Properties and Changes of Properties in Matter (NSES) -Transfer of Energy (NSES) -Conservation of Energy and the Increase in Disorder (NSES)
Describe and graph quantities such as area and volume to address scientific questions.		5-ESS2-2 Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	Data Analysis: Basic Graphing Data Analysis: Rocket Launch Straw Rockets	-Develop fluency in adding, subtracting, multiplying, and dividing whole numbers. (NCTM) -Represent and analyze patterns and functions using words, tables, and graphs. (NCTM) -Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions. (NCTM) -Investigate how a change in one variable relates to a change in a second variable. (NCTM) -Collect data using observations, surveys, and experiments. (NCTM) -Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. (NCTM) Motions and Forces (NSES) -Investigate how a change in one variable relates to a change in a second variable. (NCTM) -Identify and describe situations with constant or varying rates of change and compare them. (NCTM) -Collect data using observations, surveys, and experiments. (NCTM) -Represent data using tables and graphs such as line plots, bar graphs, and line graphs. (NCTM) -Predict the probability of outcomes of simple experiments and test the predictions. (NCTM)

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Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.	Earth and Human Activity	5-ESS3-1 Obtain & combine information about ways individual communities use science ideas to protect the Earth's resources & environment.	Introduction to the Engineering Design Process Engineering Design Process: Eggbert Numbers and Number Relationships: Eggbert Extension Activity	-Critical Thinking, Problem Solving, and Decision Making (ISTE) -Science & Technology in Society (NSES) -Solve problems that arise in mathematics and in other contexts. (NCTM) -Apply and adapt a variety of appropriate strategies to solve problems. (NCTM) -Develop fluency in adding, subtracting, multiplying, and dividing whole numbers. (NCTM) -Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools. (NCTM) -Understand numbers, ways of representing numbers, relationships among numbers, and number systems. (NCTM)

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