Adair County Middle School

2019-2020

6th Grade Middle Science STANDARDS / PACING GUIDE

Clarification Statement for each standard, Science and Engineering Practices, Disciplinary Core Ideas, Crosscutting Concepts and KAS Connections can be viewed by clicking on the link of the title in each section.

Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary
Introduction **Procedures and Rules** **Scientific Method** **CER** **MAP TESTING**	I am learning the procedures and rules. I am learning the Scientific Method. I am learning to state my claim. I am learning to show evidence and reasoning.	Weeks 1-4	Procedures and rules Claim Evidence Reasoning Scientific Method Observational Experiment Controlled Experiment Literature Research Analyzing Evidence Quantitative Observations Conclusion Experimental Group Question Outcome (Dependent) Variable Constants Hypothesis Control Group Qualitative Observations Prediction Test (Independent) Variable Bar Graph Line Graph Circle Graph

Energy **Students who demonstrate understanding can:**				
08-PS3-1 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and the speed of an object.	I am learning to... ....*describe* relationships between energy, motion, force and work. ...*make observations* that speed is related to the amount of energy in an object as well as work with gravitational and elastic potential energy.	**Taught with PS2-1**	Energy Kinetic Motion Potential Force Mass Speed Work Power	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science** **Study Jams**
07-PS3-2 Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.	...*determine* the difference between kinetic and potential energy. ...*plan* an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	**Taught with PS2-1**	Kinetic Energy Potential Energy Gravitational Potential Energy	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science** **Study Jams**

Forces and Interactions **Students who demonstrate understanding can:**				
06-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	...*understand* that when a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment so that the forces are balanced.	**Weeks 5-10**	Energy Friction Motion Newton's 1st Law Newton's 2nd Law Mass Weight Sir Isaac Newton	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
06-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	...*describe* how mass and acceleration affect forces on colliding objects.	**Weeks 5-10**	Acceleration Mass Motion	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
07-PS2-4 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	...*describe* how gravity and friction are related to energy. ...*explain* the phenomena of how objects falling at the same rate occurs.	**Weeks 5-10**	Friction Gravity	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**

Structure and Properties of Matter **Students who demonstrate understanding can:**				
06-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.	...*describe* and *classify* matter.	**2 weeks**	Matter Substance Physical property Chemical property Atom Element Molecule	**-middleschoolchemistry.com** **-Flocabulary** **-Kessler** **-betterlesson.com** **-Elevate Science**
06-PS1-4 Develop a model that predicts and describes changes in particle motion,	...*predict* changes in particle motion and	**1 weeks**	Solid Liquid Surface Tension	**-middleschoolchemistry.com**

temperature, and state of a pure substance when thermal energy is added or remove.	changes in states of matter.		Viscosity Gas Thermal Energy Temperature Melting Point Freezing Point Vaporization	**-Flocabulary** **-Kessler** **-Betterlesson.com** **-Elevate Science**
Energy **Students who demonstrate understanding can:**				
07-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	...*identify* the difference between thermal energy and temperature. ...*Apply* scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	**1 week**	Thermal Energy Heat Temperature Transfer Minimize Maximize	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
07-PS3-4 Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	...*describe* and model the transfer of heat energy.	**1 week**	Energy Transfer Change Mass Kinetic Potential Temperature Measure	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
07-PS3-5 Construct, use and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	...*explain* differences in forms of energy. ...*model* the law of conservation of energy. ...*explain* how and why different materials respond differently to heat.	**1 week**	Conduction Convention Radiation	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**

Structure, Function and Information Processing **Students who demonstrate understanding can:**				
07-LS1-1 Conduct an investigation to provide evidence that living things are made of cells, either one cell or many different numbers and types of cells.	**...***identify* characteristics of living organisms. ...*conduct* an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	**1 week**	Organism Cells Living Nonliving	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
07-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	...*determine* how cells make up the structure of living things. ...*identify* the special structures (organelles) within cells. ...*describe* the function of cell organelles with special emphasis on the cell membrane. ...model the similarities between cells and other systems.	**2 weeks**	Cell Microscope Cell Theory Organelle Cell Wall Cell membrane Cytoplasm Nucleus Mitochondria Chloroplast Vacuole Structure	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
07-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	...*recognize* that body systems are made of tiny parts working together. ...*relate* single cells to tissues to organs to organ systems to an organism.	**1 week**	Cells Tissues Organs Systems Organisms	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
Matter and Energy in Organisms and Ecosystems **Students who demonstrate understanding can:**				
07-LS1-6 Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	...*identify* the purpose of photosynthesis. ...*describe* the role of photosynthesis in the ecosystem.	**1 week**	Photosynthesis Autotroph Heterotroph Chlorophyll	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
07-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support and/or release energy as this matter moves through an organism.	...*describe* that within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.	**1 week**	Cellular Respiration Glucose	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
06-LS2-1 Analyze and interpret data to provide	...*identify*	**1 week**	Organisms Habitat	**Flocabulary**

evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	populations of organisms and what affects the populations. ...*describe* that things in an ecosystem rely on a web of interdependence. These relationships can take on many forms.		Biotic Factor Abiotic Factor Habitat Population Community Ecosystem Limiting Factor Resource	**Kessler** **Betterlesson.com** **Elevate Science**
06-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	...*describe* the energy flow within an ecosystem. ...*describe* the law of conservation of mass and the law of conservation of energy.	**2 weeks**	Producer Consumer Decomposer Food Chain Food Web Energy Pyramid Role Law of Conservation of Mass Law of Conservation of Energy Evaporation Condensation Precipitation	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
08-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	...*describe* biodiversity and determine the factors that impact it. ...*investigate* the idea that small changes in one part of a system might cause large changes in another.	**Taught with LS2-3**	Biodiversity Extinction Invasive species Value	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
Interdependent Relationships in Ecosystems **Students who demonstrate understanding can:**				
06-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	...*model* how resources availability affects organisms in an ecosystem ...*describe* the symbiotic relationships within an ecosystem. ...*find* the similarities and differences between ecosystems.	**Taught with LS2-3**	Niche Competition Predation Commensalisms Mutualism Parasitism Interactions Succession Pioneer Species	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**

Earth's Systems **Students who demonstrate understanding can:**				
06-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	...*describe* the components and processes of an Earth system. ...*explain* Earth's landforms and how they were developed. ...*Compare* multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	**2 weeks**	Atmosphere Geosphere Hydrosphere Cryosphere Biosphere Energy Topography Landform Mountain Coastline Dune River Delta Surveying	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
06-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	...*discuss and model* the movement of water on earth.	**1 week**	Water Cycle Evaporation Transpiration Condensation Precipitation Watershed Aquifer Well	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
History of Earth **Students who demonstrate understanding can:**				
06-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	...*explain* the landforms produced by plate tectonics. ...*describe* why tsunamis and earthquakes occur. ...*determine* volcanic activity. ...*explain* the differences between weathering and erosion. ...*identify* how water changes the shape of the Earth's surface.	**2 weeks**	Divergent boundary Convergent boundary Transform boundary Stress Tension Compression Shearing Fault Earthquake Magnitude Tsunami Volcano Magma Lava Hot spot Extinct Dormant Active Composite Erosion Mechanical weathering Chemical weathering Soil Humus Runoff Sediment Deposition Stream Tributary Flood plain Delta Alluvial fan Groundwater Glacier Continental glacier Ice age Valley glacier	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
06-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to	...*identify* continental drift. ...*model* plate tectonics.	**Taught with ESS2-2**	Mid-ocean ridge Sea-floor spreading Subduction Ocean	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**

provide evidence of the past plate motions.	...*describe* the processes that change the surface of the Earth.			
Weather and Climate **Students who demonstrate understanding can:**				
06-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.	...*explain* the phenomena of weather in terms of changing atmospheric conditions. ... *compare* how maritime and continental air masses affect local weather.	**2 weeks**	Atmosphere Air pressure Altitude Front Wind	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
06-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	...*analyze* weather maps as we develop our own understanding of the relationships between air pressure and clouds, factors that influence climate, weather fronts and the jet stream.	**Taught with ESS2-5**	Meteorologist Front Jet Stream	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
Space Systems **Students who demonstrate understanding can:**				
06-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.	...*discover* patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models ...*discover* that Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun.	**1 week**	Moon Satellite Planet Star Motion Axis	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**
06-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system.	...*understand* that the solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them ...*determine* sizes and distances between planets, sun, moons and asteroid belts ...*examine* the space between planets	**1 week**	Asteroid Galaxy Gravity Universe Light year	**Flocabulary** **Kessler** **Betterlesson.com** **Elevate Science**

Engineering Design **Students who demonstrate understanding can:**				
MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	...organize and develop steps and then apply new knowledge in a design challenge.		Environment Impact Solution Design Constraints	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	...*design* and evaluate various solutions to problems		Analyze Criteria	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	...*test and record* data to develop the best solution for a design problem.		Solution	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**
MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	**...***test and modify* a design or test for optimal design and criteria data.		Modify	**Flocabulary** **Kessler** **betterlesson.com** **Elevate Science**