6th Grade Science Pacing

**Trimester 1**

Ecosystems

***Matter and Energy in Organisms and Ecosystems***

MS-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.

MS-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. \*\*

MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. \*\*

MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

***Interdependent Relationships in Ecosystems***

MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. \*\*

MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services. \* \*\*

***Natural Selection and Adaptations***

MS-LS4-1 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.\*\*

\* - Integrates traditional science content with engineering. C:\Users\Taylor\AppData\Local\Microsoft\Windows\INetCache\IE\5MZAHRQ3\michigan_rbh2[1].jpg Includes a Michigan specific performance expectation.

\*\*- Allow for local, regional, or Michigan specific contexts or examples in teaching and assessment.

6th Grade Science Pacing

**Trimester 2**

Matter and Energy

***Structure and Properties of Matter***

MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

***Chemical Reactions***

MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

***Forces and Interactions***

MS-PS2-1 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.\*

MS-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.

MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

MS-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.

MS-PS2-5 Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

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6th Grade Science Pacing

**Trimester 3**

Energy

***Energy***

MS-PS3-1 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

MS-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.

MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. \*

MS-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.

MS-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.

Earth Science

***Earth’s Systems***

MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process. \*\*

MS-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. \*\*

MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes. \*\*

***Human Impacts***

MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. \* \*\*

MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.

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6th Grade Science Pacing

**Engineering Principles:**

The following Michigan Science Standards are embedded throughout the year in the sixth grade science curriculum.

***Engineering Design***

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.

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

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.

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.