**USD #312 NGSS/SCIENCE STANDARDS**

***CHECKLIST*:** ***Eighth Grade Science***

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| **Standard** | **Dates Taught** | **Notes** |
| **Matter and its Interactions** |
| **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. |  |  |  |  |  |
| **MS-PS1-5:** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. |  |  |  |  |  |
| **MS-PS1-6:** Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.\* |  |  |  |  |  |
| **Motion and Stability: Forces and Interactions** |
| **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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| **Standard** | **Dates Taught** | **Notes** |
| **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. |  |  |  |  |  |
| **Biological Evolution: Unity and Diversity** |
| **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. |  |  |  |  |  |
| **MS-LS4-2:** Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. |  |  |  |  |  |

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| **Standard** | **Dates Taught** | **Notes** |
|  | **Biological Evolution: Unity and Diversity** |
|  | **MS-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. |  |  |  |  |  |
|  | **MS-ESS1-2:** Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. |  |  |  |  |  |
|  | **MS-ESS1-3:** Analyze and interpret data to determine scale properties of objects in the solar system. |  |  |  |  |  |
|  | **MS-ESS1-4:** Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history. |  |  |  |  |  |
|  | **Earth’s Systems** |
|  | **MS-ESS2-2:** Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales. |  |  |  |  |  |
|  | **MS-ESS2-3:** Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. |  |  |  |  |  |
|  | **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. |  |  |  |  |  |
|  | **Earth and Human Activity** |
|  | **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. |  |  |  |  |  |

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| **Standard** | **Dates Taught** | **Notes** |
|  | **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. |  |  |  |  |  |