Grade Eight -- Physical Sciences

Next Generation Science Standards for California Public Schools

correlated with

Exploration Education's Online Advanced Physical Science

***Lessons in Exploration Education's* Advanced Physical Science Curriculum covering these standards.**

MS-PS1	MATTER AND ITS INTERACTIONS	*Correlates with lesson #:*
MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.	20.3, 21.1, 24.1, 24.4
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.	21.4, 25.3, 26.1, 26.3, 27.1, 27.2
MS-PS1-3	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	24.4, 25.5, 26.4, 27.4
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.	7.4, 7.5, 21.1, 21.4, 22.4, 22.5, 23.4, 32.4, 32.5
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.	25.2, 20.5, 22.1, 25.3
MS-PS1-6	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	7.4, 7.5, 26.1, 26.2, 26.3, 27.1

MS-PS2	MOTION AND STABILITY: FORCES AND INTERACTIONS	*Correlates with lesson #:*
MS-PS2-1	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	1.2, 1.4, 1.5, 4.1, 5.4, 7.3
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.	1.2, 1.4, 1.5, 4.1, 5.4, 7.3, 31.4, 31.5
MS-PS2-3	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	10.2, 10.3, 11.4, 16.3, 16.4, 16.5
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.	1.4, 2.1, 4.2, 5.4, 6.4, 23.2
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.	15.1, 15.2, 15.3, 15.4, 16.1, 16.3, 17.2, 17.3

MS-PS3	ENERGY	*Correlates with lesson #:*
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.	3.1, 3.2, 4.4, 4.5, 9.1, 9.4
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.	3.1, 9.1, 9.2, 15.4, 19.4
MS-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	22.4, 23.4, 32.4, 32.5, 35.4
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.	7.4, 9.1, 21.1, 21.2, 21.3, 21.4, 21.5, 22.4, 23.4
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.	3.1, 3.2, 9.1, 21.3, 21.4

MS-PS4	WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER	*Correlates with lesson #:*
MS-PS4-1	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	28.3, 28.4, 28.5, 29.4, 29.5, 30.3
MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	28.4, 28.5, 29.2, 29.3, 30.3, 30.4, 35.4, 35.5
MS-PS4-3	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.	16.4, 17.1, 31.2

MS-ETS1	Engineering Design	*Correlates with lesson #:*
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.	4.1, 4.4
MS- ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	16.5, 30.5, 33.5
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.	16.5, 33.5
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.	16.5, 33.5