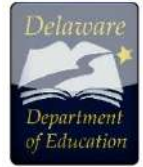# 6th Grade

Change Over Time
How do people figure out that Earth and life on Earth have changed over time?

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.
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. (1A, 2Ai, ii, iii)*
MS ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Earth Systems
How do the materials in and on the earth change over time?

MS ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
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.
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. (related to interior processes and surface processes)

Tectonic Plates
How does the movement of tectonic plates impact the surface of the Earth?

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.

Solar System
What makes up our solar system?

MS ESS 1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
MS ESS 1-3 Analyze and interpret data to determine scale properties of objects in the solar system.

Earth
What is Earth's place in the universe?

MS ESS 1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
**MS ESS 1-3** Analyze and interpret data to determine scale properties of objects in the solar system.

How can the motion of the Earth explain seasons and eclipses?

MS ESS 1-1 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 ESS 1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

*Refer to Evidence Statements in www.nextgenscience.org (revised 7/13/2016)
Adapted from Achieve. (2016, January 28, 2016), from http://www.nextgenscience.org

6th Grade
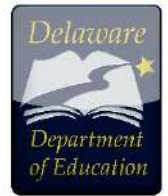
How can one describe physical interactions between objects within a system?

MS PS 2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

MS PS 2-2 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 PS 2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

MS PS 2-4 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

MS PS 2-5 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.

Engineering Design-Bundled as Appropriate

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking inot 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.

Adapted from Achieve. (2016, January 28, 2016), from http://www.nextgenscience.org