

7th Grade



Cells

How do the structures of organisms contribute to life's functions?

MS 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.

MS 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.

MS LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Growth, Development, and Reproduction of Organisms

How do organisms grow, develop, and reproduce?

MS LS1-4: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. (2A, @V, 3Ai, #ii, #iii)

MS LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS LS3-1: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

MS LS3-2: Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

MS LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

Natural Selection

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 (Emphasis is on the support for evolutionary relationships; changes in organisms)

MS LS4-2: Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organism and between modern and fossil organisms to infer evolutionary relationships. (Emphasis is on support for evolutionary relationships; changes in organisms)

MS LS4-3 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

MS LS4-4: Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

MS LS4-6: (i, ii, iii)* Use mathematical representations to support explanations of how natural selection many lead to increases and decreases of specific traits in populations over time

*Refer to evidence statements in www.nextscience.org

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



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Molecular Structure

How can particles combine to produce a substance with different properties?

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

MS PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Effects of Thermal Energy

How does thermal Energy affect particles?

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.

What happens when new materials are formed? What stays the same and what changes?

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.

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 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.

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