

Prairie Hill School District #133
2022-23 7th Grade Science Instructional Guide

Power Standards	Learning Targets
ETS1-2 <u>Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</u> Unit includes instruction on components of: <i>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.</i>	Identify criteria and constraints of a design solution. Identify a systematic design solution. Transform/revise weaknesses to strengthen the design. Evaluate competing designs by comparing how well each design met the criteria and constraints of the problem.
RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	<u>Communicate scientific findings using Claim, Evidence and Reasoning.</u>
ESS1-4 <u>Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize the Earth's 4.6 billion year old history.</u>	Demonstrates an understanding of how the geological time scale shows the diversity of life throughout the Earth's 4.6 billion year old history. Demonstrates understanding of the law of superposition. Demonstrates an understanding of how to use the location and age of fossils within rock layers.

LS4-1 Patterns in the Fossil Record: <u>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.</u>	Demonstrating understanding that natural laws (erosion, weathering, deposition) operate today the same way they operated in the past. Analyze and interpret data to document the existence of diversity and changes in life forms throughout the history of life. Analyze and interpret data to document the extinction of life.
LS4-2 Modern and Fossil Organisms, Evolutionary Relationships: <u>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.</u>	Use evidence to explain similarities and differences between modern and fossil organisms. Use evidence of vestigial and homologous structures to explain how anatomical differences can evolve over time. Construct an argument about how environments have affected/shape anatomical structures of organisms.
LS4-4 Natural Selection: <u>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.</u> <i>not reported on LS4-6 Mathematical Modeling of Natural Selection: Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in population over time.</i>	Describe the cause and effect relationship of the inheritance of certain traits which increases the chances of survival. Make a claim about how genetic variations increase the chances of survival and support it with empirical evidence. Construct an explanation describing how genetic variations increase the chances of survival so an individual can reproduce.
LS1-4 Animal Behavior and Plant Structures: <u>Use argument based on empirical evidence and</u>	Identify plant structures that affect successful reproduction.

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<u>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.</u> <i>not reported on LS1-5 Environmental and Genetic Growth Factors: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</i>	Construct an explanation of how plant structures affect successful reproduction. Identify animal behaviors and construct an explanation of how they affect the probability of successful reproduction. Create an argument using evidence to explain how animal behaviors and/or plant structures affect the probability of successful reproduction.
LS1-3 <u>Use an argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.</u>	Understands the functioning of the major body systems. Create a claim supported by evidence and reasoning on how a major bodily system is composed of groups of cells. Develop a model that uses evidence to show how cells are specific to the living organisms they compose. (Bacteria, Plant Animal)
LS1-2 Cell Parts Cell Model: <u>Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to the function.</u> <i>Not reported on: 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.</i>	Use a model to explain how organelles have specific cell functions. (Bacteria, Plant, Animal) Use a model to show the structure of a cell membrane and explain how it relates to function. (Diffusion and Osmosis) Use a model to explain the function of the cell as a system.
LS3-1 Genetic Change Effects: <u>Develop and use a</u>	Use a model to show how cells replicate DNA.

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<u>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.</u>	Recognize and use the DNA pattern to create messenger RNA and transfer RNA strands. Develop a model that is accurate and demonstrates a well developed understanding of mutations to DNA. Use a model to show how mutations may be harmful, beneficial, or neutral to the structure and function of an organism.
LS3-2 Asexual and Sexual Reproduction: <u>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.</u>	Develop a model to show why asexual reproduction results in offspring with identical DNA. Explain why asexual reproduction produces offspring with identical DNA. Develop a model to show why sexual reproduction results in offspring with genetic variation. Explain why sexual reproduction produces offspring with genetic variations.