

Unit 6.5

Prior and Future Knowledge

Click below for prior and future knowledge for each NGSS dimension:

- [DCIs - Disciplinary Core Ideas](#)
- [SEPs - Science and Engineering Practices](#)
- [CCCs - Crosscutting Concepts](#)

DCIs	Prior Knowledge		Future Knowledge	
	3 - 5 Standards	Mi-STAR Sequence	Mi-STAR Sequence	9 - 12 Standards
LS1.B Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5)	“Reproduction is essential to every kind of organism. Organisms have unique and diverse life cycles.”	Not applicable	Unit 7.6	“Growth and division of cells in organisms occurs by mitosis and differentiation for specific cell types.”
LS2.A Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1) In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other	“The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.”	Not applicable	Unit 6.6	“Ecosystems have carrying capacities resulting from biotic and abiotic factors. The fundamental tension between resource availability and organism populations affects the abundance of species in any given ecosystem.”

for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1) Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)				
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SEPs	Prior Knowledge		Future Knowledge	
	3 - 5 Standards	Mi-STAR Sequence	Mi-STAR Sequence	9 - 12 Standards
Constructing Explanations and Designing Solutions Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-5)	"Construct an explanation of observed relationships (e.g., the distribution of plants in the backyard)." "Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem." "Identify the evidence that supports particular points in an explanation."	Not applicable	Units 6.7, 7.2A/B, 7.4	"Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables." "Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future." "Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking

				into account possible unanticipated effects.” “Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.”
Analyzing and Interpreting Data Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1)	“Represent data in tables and/or various graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.” “Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.” “Compare and contrast data collected by different Groups in order to discuss similarities and differences in their findings.”	Unit 6.2	Unit 8.6	“Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.” “Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.”

	“Analyze data to refine a problem statement or the design of a proposed object, tool, or process.”			“Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.” “Compare and contrast various types of data sets (e.g., self-generated, archival) to examine consistency of measurements and observations.” “Evaluate the impact of new data on a working explanation and/or model of a proposed process or system.”
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CCCs	Prior Knowledge		Future Knowledge	
	3 - 5 Standards	Mi-STAR Sequence	Mi-STAR Sequence	9 - 12 Standards
Cause and Effect Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-5) Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1)	“Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity might or might not signify a cause and effect relationship.”	Unit 6.1	Units 7.1, 7.4, 7.5, 7.6, 8.1, 8.3, 8.5B, 8.7	“Students understand that empirical evidence is required to differentiate between cause and correlation and to make claims about specific causes and effects. They suggest cause and effect relationships to explain and predict behaviors in complex natural and designed systems. They also propose causal relationships by examining what is known about smaller scale mechanisms within the system. They recognize changes in systems may have various causes that may not have equal effects.”