

Wright City Science Curriculum

Grade	8th Grade
Unit of Study	Genetics
Length of Unit	7 Weeks

Sample Essential Questions	Sample Corresponding Big Ideas
How does the variation of traits within a population affect its ability to survive and thrive? How do organisms pass on their advantageous traits to future generations?	Variation Matters: Organisms within a population have different traits (genetic variations), and these differences are inherited.
Why are certain traits helpful to an organism in one environment but not in another? How does the environment "select" for certain traits, leading to changes in a population over time?	Survival of the Fittest (in context): The specific environment determines which traits are helpful and which are not. Individuals with helpful traits are more likely to survive, find mates, and have offspring.
What evidence can be used to explain the relationship between genetic variation and an organism's probability of surviving and reproducing?	Passing on Success: Organisms that survive and reproduce pass their advantageous traits to their offspring, causing those traits to become more common in the population over generations.
How have humans intentionally changed the traits of organisms over time? What are the positive and negative impacts of humans influencing the inheritance of desired traits in organisms?	Human Influence on Genetics: Humans actively influence the inheritance of traits in other organisms through various technologies, which is a process known as artificial selection or selective breeding.
What are the positive and negative impacts of humans influencing the inheritance of desired traits in organisms?	Purpose-Driven Change: These changes are often made to achieve specific goals, such as increasing crop yield, improving livestock, or developing disease resistance.
How do we use the data in a graph to support the claim that natural selection is occurring? What environmental factors could cause the change in trait frequency shown on a graph? How many generations does it take for a beneficial trait to become more common in a population?	Trait Frequency Changes: Over time, traits that help an organism survive and reproduce become <i>more</i> common (increase in frequency), while traits that are not helpful become <i>less</i> common (decrease in frequency).
What are the different environmental factors that can change or affect an organism's growth? (e.g., how much water, sunlight, or food it gets) How can we use scientific evidence to prove that both genes and the environment influence an organism's growth?	Environmental Factors as Modifiers: Environmental factors (like access to food, water, sunlight, temperature, and disease) act on the genetic potential, determining where on the range an organism's actual growth will fall.

Missouri Learning Standards

Priority Standards

6-8.LS4.B.1: 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. [Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.]

6-8.LS4.B.2: Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. [Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, and farming practices).]

6-8.LS4.C.1: Interpret graphical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

6-8.LS1.B.2: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

6-8.LS1.B.1: Construct an explanation for how characteristic animal behaviors as well as specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

Secondary Standards (Background Information)

6-8.LS2.A.2: Construct an explanation that predicts the patterns of interactions among and between the biotic and abiotic factors in a given ecosystem. [Clarification Statement: Relationships may include competition, predation, and symbiosis.]

Unit 1 Sequence

MLS	Topic(s)	Learning Targets	Academic Vocabulary
6-8.LS4.B.1	Inheritance	I will be able to describe the cause and effect relationship of gene transmission from parents to offspring and the resulting genetic variations.	Gene, Traits, Inheritance, Dominant Allele, Recessive Allele, Punnett Square, Homozygous, Heterozygous, Natural Selection, Artificial Selection, Adaptation, Reproduction, DNA, Chromosome, Gregor Mendel, Mutation, Genetic Variation, Population, Environment, Desired Traits, Selective Breeding, Genetic Modification (or Genetic Engineering), Generations, Adaptations,
6-8.LS4.B.2	Selective Breeding	I will be able to describe and give examples of how through artificial selection, humans have changed the occurrence of traits in a population over generations.	
6-8.LS4.C.1	Natural Selection	I will be able to use data and evidence to explain how natural selection can make certain traits more or less common in a population over time.	
6-8.LS1.B.2	Adaptations	I can explain how changes in the genetic traits and the environment affect the survival, growth, and behavior of organisms in an ecosystem.	
6-8.LS1.B.1	Reproductive Behaviors	I can explain how plants and animals have developed behaviors and structures that are beneficial for reproductive success.	

MLS	Learning Activities	
6-8.LS2.A.2	Abiotic & Biotic Factors Notes	Must Do
6-8.LS2.A.2	Abiotic & Biotic Factors Diagram	Can Do
6-8.LS2.A.2	Abiotic & Biotic Factors Escape Room Activity	Optional Level
6-8.LS4.B.1, 6-8.LS1.B.2	Doggo Genetics Notes	Must Do
6-8.LS4.B.1, 6-8.LS1.B.2	Generation Genius: Mutations Activity	Can Do
6-8.LS4.B.1, 6-8.LS1.B.2	Zombie Genetics Lab	Must Do
6-8.LS4.B.1, 6-8.LS1.B.2	Genetics Article Assignment	Can Do
6-8.LS4.C.1, 6-8.LS4.B.2, 6-8.LS1.B.1	Natural Selection Notes	Must Do
6-8.LS4.C.1, 6-8.LS4.B.2	Natural Selection Station Lab	Must Do
6-8.LS4.C.1, 6-8.LS4.B.2, 6-8.LS1.B.1	Natural Selection Reading Comprehension Assignment	Can Do
6-8.LS4.C.1, 6-8.LS4.B.2	Bill Nye: Evolution Activity	Can Do
6-8.LS1.B.1	Asexual and Sexual Reproduction Notes	Must Do
6-8.LS1.B.1	Plants & Animals Reproduction and Growth Notes	Must Do
6-8.LS1.B.1	Animal & Plant Reproductive Success Reading Comprehension Assignment	Can Do

Assessments		
MLS	Description or Location	Rubric/Location
6-8.LS4.C.1, 6-8.LS4.B.2, 6-8.LS4.B.1, 6-8.LS1.B.2, 6-8.LS2.A.2, 6-8.LS1.B.1	Unit 1 Quiz 26/27	Pear Assessment

Additional Resources