Grades 6–8

3.1.6-8.T Life Science: Natural Selection and Evolution

Students who demonstrate understanding can *use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.*

Clarifying Statement: Emphasis is on using mathematical models, probability statements, and proportional reasoning to support explanations of trends in changes to populations over time.

Assessment Boundary: Assessment does not include Hardy Weinberg calculations.

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CCC)
Using Mathematics and Computational Thinking Mathematical and computational thinking in 6–8 builds on K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments. • Use mathematical representations to support scientific conclusions and design solutions.	**Adaptation** • Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes.	**Cause and Effect** • Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.

Pennsylvania Context: Examples of Pennsylvania context include but are not limited to genetic variations in local Pennsylvania species such as albino squirrels, black squirrels, albino deer, Pennsylvania elk, timber rattlesnakes, river otters, or brown trout.

PA Career Ready Skills: Analyze various perspectives on a situation.

Connections to Other Standards Content and Practices

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
Agriculture (AFNR)	CS.02.02.01.a: Identify and summarize the components within AFNR systems (e.g., Animal Systems: health, nutrition, genetics, etc.; Natural Resources Systems: soil, water, etc.).
Science, Environmental Literacy and Sustainability (NAAEE)	5-8 Strand 2.1.B. Earth's living systems: Learners identify basic similarities and differences among a wide variety of living organisms. They explain ways that living organisms, including humans, affect the environment in which they live, and how their environment affects them.
PA Core Standards: ELA	N/A

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Core Standards and Practices: Math	MP.4: Model with mathematics. CC.2.1.7.D.1: Analyze proportional relationships and use them to model and solve real-world and mathematical problems. CC.2.4.7.B.1: Draw inferences about populations based on random sampling concepts. CC.2.4.7.B.3: Investigate chance processes and develop, use, and evaluate probability models.
PA Standards: Social Studies	7.4.6.A: Describe and explain the effects of the physical systems on people within regions.
Educational Technology (ISTE)	1.5. Computational Thinker: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
Technology and Engineering (ITEEA)	STEL-3G: Explain how knowledge gained from other content areas affects the development of technological products and systems.