THE STANDARD

Genetic Variation for Survival

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.

DCI
DISCIPLINARY CORE IDEA

LS4.B · Natural Selection

> *Natural selection leads to the predominance of certain traits in a population, and the suppression of others.*

Inside any population, individuals are slightly different from one another. Some of those differences are inherited. When the environment makes certain traits more useful for staying alive and producing offspring, the individuals carrying those traits leave behind more descendants. Over generations, the common version of the trait shifts. **That shift is natural selection.**

SEP
SCIENCE & ENGINEERING PRACTICE

Constructing Explanations and Designing Solutions

> *Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena.*

Students aren't memorizing "survival of the fittest." They're building an explanation grounded in data: trait variation existed, the environment favored one version, more of those individuals reproduced, the next generation looked different. **The explanation has to connect cause to effect with numbers or proportions, not just storytelling.**

CCC
CROSSCUTTING CONCEPT

Cause and Effect

> *Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.*

The cause-and-effect chain in natural selection runs through probability. A dark moth on a soot-covered tree isn't guaranteed to live. It just has a better chance than a light moth on the same tree. **Students reason about shifting odds across a population, not guaranteed outcomes for individuals.**