

Grade. Standard. Grade Level Expectation. Evidence Outcome (NGSS Standard Code)

Standard 2: Biology (Life Science)

HS.2.1: DNA codes for the complex hierarchical organization of systems that enable life's functions.

HS.2.1.a: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells. (HS-LS1-1)

HS.2.1.c: Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. (HS-LS1-3)

HS.2.2: Growth and division of cells in complex organisms occurs by mitosis, which differentiates specific cell types.

HS.2.2.a: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. (HS-LS1-4)

HS.2.3: Organisms use matter and energy to live and grow.

HS.2.3.a: Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. (HS-LS1-5)

HS.2.3.b: Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. (HS-LS1-6)

HS.2.3.c: Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy. (HS-LS1-7)

HS.2.4: Organisms interact with the living and nonliving components of the environment to obtain matter and energy.

HS.2.4.b: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. (HS-LS2-2)

HS.2.5: Matter and energy necessary for life are conserved as they move through ecosystems.

HS.2.5.b: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. (HS-LS2-4)

HS.2.6: A complex set of interactions determine how ecosystems respond to disturbances.

HS.2.6.a: Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new Ecosystem. (HS-LS2-6)

HS.2.9: Variation between individuals results from genetic and environmental factors.

HS.2.9.a: Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. (HS-LS3-3)

HS.2.9.b: Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. (HS-LS3-2)

HS.2.10: Evidence of common ancestry and diversity between species can be determined by examining variations including genetic, anatomical and physiological differences.

HS.2.10.a: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. (HS-LS4-1)

HS.2.11: Genetic variation among organisms affects survival and reproduction.

HS.2.11.a: HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

HS.2.12: The environment influences survival and reproduction of organisms over multiple generations.

HS.2.12.a: Construct an explanation based on evidence for how natural selection leads to adaptation of populations. (HS-LS4-4)

HS.2.12.b: Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. (HS-LS4-5)