Correlations to Next Generation Science Standards

Life Sciences Performance Expectations

LS-1 From Molecules to Organisms: Structures and Processes

HS-LS1-1 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.

Fascinating Biology Lesson 9, 12

HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of **interacting systems** that provide specific functions **within multicellular organisms**.

Fascinating Biology Lesson 7, 8, 11, 12

HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain **homeostasis**.

Fascinating Biology Lesson 13, 14

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

Fascinating Biology Lesson 7, 11, 12

HS-LS1-5 Use a model to illustrate how **photosynthesis** transforms light energy into stored chemical energy.

Fascinating Biology Lesson 5

HS-LS1-6 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.

Fascinating Biology Lesson 5, 6, 7, 8

HS-LS1-7 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.

Fascinating Biology Lesson 6, 7, 8

LS-2 Ecosystems: Interactions, Energy, and Dynamics

HS-LS2-1 Use mathematical and/or computational representations to support explanations of **factors that affect carrying capacity of ecosystems** at different scales.

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

HS-LS2-3 Construct and revise an explanation based on evidence for the **cycling of matter and flow of energy in aerobic and anaerobic conditions**.

Fascinating Biology Lesson 7

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

Fascinating Biology Lesson 5

HS-LS2-5 Develop a model illustrate the role of **photosynthesis and cellular respiration in the cycling of carbon** among the biosphere, atmosphere, hydrosphere, and geosphere.

Fascinating Biology Lesson 5, 6, 7, 8

HS-LS2-6 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-LS2-7 Design, evaluate, and refine a solution for **reducing the impacts of human activities on the environment and biodiversity**.

HS-LS-8 Evaluate evidence for **the role of group behavior on individual and species' chances to survive** and reproduce.

Fascinating Biology Lesson 16

LS-3 Heredity: Inheritance and Variation of Traits

HS-LS3-1 Ask questions to clarify relationships about the **role of DNA** and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

Fascinating Biology Lesson 9, 10, 11, 12

HS-LS3-2 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 **mutations** caused by environmental factors.

Fascinating Biology Lesson 10, 11, 12

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

Fascinating Biology Lesson 12

LS-4 Biological Evolution: Unity and Diversity

HS-LS4-1 Communicate scientific information that **common ancestry** and biological evolution are supported by multiple lines of empirical evidence.

Fascinating Biology Lesson 15

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.

Fascinating Biology Lesson 16

HS-LS4-3 Apply concepts of statistics and probability to support explanations that **organisms with an advantageous heritable trait tend to increase** in proportion to organisms lacking this trait.

Fascinating Biology Lesson 15, 16

HS-LS4-4 Construct an explanation based on evidence for **how natural selection leads to adaptation** of populations.

Fascinating Biology Lesson 16, 17, 18

HS-LS4-5 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.

Fascinating Biology Lesson 16

HS-LS4-6 Create or revise a simulation to test a solution to **mitigate adverse impacts of human activity** on biodiversity.