

**Biology, APEX**

| <b>Academic Standards Alignment Rubric Criteria</b>   | <b>Score</b>    |
|---|-----------------|
| 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.   | <i>3 of 3</i>   |
| Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.  | <i>3 of 3</i>   |
| Plan and conduct an investigation to provide evidence of the importance of maintaining homeostasis in living organisms.   | <i>3 of 3</i>   |
| Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.   | <i>3 of 3</i>   |
| Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.   | <i>3 of 3</i>   |
| Construct & revise an explanation based on evidence for how carbon, hydrogen, & oxygen from sugar molecules may combine w/ other elements to form amino acids and/or other large carbon-based molecules.  | <i>3 of 3</i>   |
| 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.  | <i>3 of 3</i>   |
| Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.   | <i>2.5 of 3</i> |
| Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.   | <i>3 of 3</i>   |
| Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.   | <i>3 of 3</i>   |
| Use a mathematical representation to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.   | <i>3 of 3</i>   |
| Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.   | <i>3 of 3</i>   |
| Evaluate the 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.   | <i>3 of 3</i>   |
| Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.   | <i>2.5 of 3</i> |
| Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.   | <i>3 of 3</i>   |
| 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.  | <i>3 of 3</i>   |
| Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.   | <i>2.5 of 3</i> |
| Analyze and evaluate how evidence such as similarities in DNA sequences, anatomical structures, and order of appearance of structures during embryo-logical development contribute to the scientific explanation of biological diversity.   | <i>2.5 of 3</i> |
| Construct an explanation based on evidence that biological diversity is influenced by (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. | <i>3 of 3</i>   |
| 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.  | <i>2.5 of 3</i> |
| Construct an explanation based on evidence for how natural selection leads to adaptation of populations.  | <i>3 of 3</i>   |
| Synthesize, communicate, and evaluate the information that describes how changes in environmental conditions can affect the distribution of traits in a population causing.   | <i>3 of 3</i>   |
|   | <b>2.89</b>     |
|   | <i>out of 3</i> |