SCILLSS Classroom Science Assessment Workshop

# High School Life Science Completed Unpacking Tool – Activity Answer Key

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| **Grade:**  | High School |  |  |
| **NGSS Performance Expectation: 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. |
|  | **Science and Engineering Practices (SEP)** | **Disciplinary Core Ideas (DCI)** | **Crosscutting Concepts (CCC)** |
| **SEP:** **Engaging in Argument from Evidence**Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments. | **DCI:** **LS4.C: Adaptation*** Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species.
* Species become extinct because they can no longer survive and reproduce in their altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species’ evolution is lost.
 | **CCC:** **Cause and Effect**Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. |
| **Key Aspects** | * Evaluate arguments about a natural phenomenon based on scientific concepts, principles, and big ideas.
* Evaluate arguments about a solution to a scientific/engineering problem based on scientific concepts, principles, and big ideas.
* Compare and critique arguments on the same topic by evaluating the evidence and/or interpretations of facts.
* Use evidence to evaluate the merit of an argument.
* Support or refute an arguments/explanation based on an analysis of data for a phenomenon or a solution to a problem.
 | * Naturally occurring changes in the physical environment may result in changes in the number of individuals of some species and emergence of new species over time.
* Human induced changes in the physical environment may result in changes in the number of individuals of some species and emergence of new species over time.
* Changes in environmental conditions may result in increases in the number of individuals for some species.
* Changes in environmental conditions may result in increases in the emergence of new species over time.
* Changes in environmental conditions may result in the decline or extinction of some species.
* There are causal links between environmental changes and changes in the number of individuals or species.
* Species become extinct because they can no longer survive and reproduce in their altered environment.
* Members of a population that cannot adjust to change that is too fast or drastic, lose the opportunity for the species’ evolution.
 | * Phenomena may have more than one cause.
* Some cause and effect relationships in systems can only be described using probability.
* Some cause and effect relationships are complex and can only be predicted using probability.
* Empirical evidence is required to differentiate between cause and correlation.
* Empirical evidence is required to make claims about specific causes and effects.
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| **Prior Knowledge** | * Use empirical evidence to construct an argument.
* Use empirical evidence to support an argument.
* Use scientific reasoning to construct an argument.
* Use scientific reasoning to support an argument.
* Use an argument to support a model for a phenomenon.
* Use an argument to refute a model for a phenomenon.
* Use an argument to support a solution to a problem.
* Use an argument to refute a solution to a problem.
* Obtain evidence from valid and reliable sources.
* Interpret data to provide evidence for phenomena.
* Analyze data to provide evidence for phenomena.
 | * Particular organisms can only survive in particular environments.
* Species can change over time in response to changes in environmental conditions through adaptation by natural selection acting over generations.
* Naturally occurring changes affect the physical environment.
* Human induced changes affect the physical environment.
* The number of individuals in each species and the number of species in an environment changes over time.
* Environmental factors can determine the ability of individual species to survive and reproduce.
* Natural selection favors organisms that are best suited for the current environmental conditions (i.e., survive, reproduce).
* Genetic variations in a population result in some organisms having more advantageous traits.
 | **Relationships to SEPs** | * Find the cause that underlies a phenomenon (e.g., a discovery of patterns or events that occur together with regularity) and provide evidence in support the explanation.
* Student engagement in scientific argumentation is often centered about identifying the causes of an effect.
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