BLUE VALLEY DISTRICT CURRICULUM

Science | Zoology

ORGANIZING THEME/TOPIC	FOCUS STANDARDS & SKILLS
UNIT 1: CHARACTERISTICS AND CLASSIFICATION OF ANIMALS Phylogenetics/Cladistics Nomenclature Symmetry Evolution Embryonic Development Levels of Organization Body Systems Protists **UNIT 2: INVERTEBRATES** Porifera Cnidaria Platyhelminthes Nematoda Annelida **UNIT 3: INVERTEBRATES** Molluska Arthropoda Echinodermata	**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.** Science & Engineering Practice (s): • **Constructing Explanations and Designing Solutions:** Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. Disciplinary Core Idea (s): • **LS1.A: Structure and Function:** Systems of specialized cells within organisms help them perform the essential functions of life Crosscutting Concept (s): • **Structure and Function:** Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem. **HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.** Science & Engineering Practice (s): • **Developing and Using Models:** Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system. Disciplinary Core Idea (s): • **LS1.A: Structure and Function:** Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. Crosscutting Concept (s): • **Systems and System Models:** Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

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UNIT 4: VERTEBRATES Chordata Fish Amphibians **UNIT 5: VERTEBRATES** Reptiles Birds	**HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.** Science & Engineering Practice (s): • **Constructing Explanations and Designing Solutions:** Design, evaluate, and refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations. Disciplinary Core Idea (s): • **LS4.D: Biodiversity and Humans:** Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction). Crosscutting Concept (s): • **Stability and Change:** Much of science deals with constructing explanations of how things change and how they remain stable. **HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.** Science & Engineering Practice (s): • **Obtaining, Evaluating, and Communicating Information:** Communicate scientific information (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically. Disciplinary Core Idea (s): • **LS4.A: Evidence from Common Ancestry and Diversity:** Genetic information provides evidence of evolution. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence. Crosscutting Concept (s): • **Patterns:** Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

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UNIT 6: VERTEBRATES Mammals **OPTIONAL PROJECT** Animal Behavior Habitat Design	**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.** Science & Engineering Practice (s): • **Analyzing and Interpreting Data:** Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible. Disciplinary Core Idea (s): • **LS4.B: Natural Selection:** The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. • **LS4.C: Adaptation:** Adaptation also means that the distribution of traits in a population can change when conditions change. Crosscutting Concept (s): • **Patterns:** Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena. **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 & Engineering Practice (s): • **Engaging in Argument from Evidence:** Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments. Disciplinary Core Idea (s): • **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. • **LS4.C: Adaptation:** 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. Crosscutting Concept (s): • **Cause and Effect:** Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.