

Outreach ZooToYou Distance Learning programs —Standards

Standards for K-12 are from the Arizona Department of Education’s Arizona Science Standard.

• **Paws, Claws, Scales, and Tails**

- Recommended for K-2nd grade
- In this program, students will explore animal body features and be introduced to the concept of physical adaptation. Our Outreach Specialists will utilize a combination of live animals, captivating video and imagery, and interactive games. Ultimately, students will work together to create their own imaginary animal as they develop an understanding of why various body features are essential for animal survival.

Strand 4

Concept 1: Characteristics of Organisms		
Understand that basic structures in plants and animals serve a function.		
Kindergarten	Grade 1	Grade 2
PO 2. Name the following human body parts: <ul style="list-style-type: none"> • head • shoulders • arms • elbows • wrists • hands • fingers • legs • hips • knees • ankles • feet • heels • toes (See 1CH-R3-01)	PO 2. Compare the following observable features of living things: <ul style="list-style-type: none"> • movement – legs, wings • protection – skin, feathers, tree bark • respiration – lungs, gills • support – plant stems, tree trunks 	PO 1. Identify animal structures that serve different functions (e.g., sensory, defense, locomotion).
PO 3. Identify the five senses and their related body parts: <ul style="list-style-type: none"> • sight – eyes • hearing – ears • smell – nose • taste – tongue • touch – skin 	PO 3. Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/among different groups of animals.	

• **The Amazing World of Adaptations**

- Recommended for 3rd -4th grade
- Designed to complement learning standards for grades 3 and 4, this program explores the physical and behavioral adaptations of a variety of plants and animals. Our Outreach Specialists will utilize a combination of live animals, captivating video and imagery, and interactive games to introduce or review the topic of adaptations.

Strand 4

Concept 4: Diversity, Adaptation and Behavior	
Identify plant and animal adaptations.	
Grade 3	Grade 4
PO 1. Identify adaptations of plants and animals that allow them to live in specific environments.	PO 1. Recognize that successful characteristics of populations are inherited traits that are favorable in a particular environment.
PO 2. Describe ways that species adapt when introduced into new environments.	PO 2. Give examples of adaptations that allow plants and animals to survive. <ul style="list-style-type: none"> • camouflage – horned lizards, coyotes • mimicry – Monarch and Viceroy butterflies • physical – cactus spines • mutualism – species of acacia that harbor ants, which repel other harmful insects

- **Conservation and Human Impacts**

- Recommended for 7th -8th grade
- Discover some human impacts on native Arizona species and how conservation biologists are working to help the environment and animals through videos, imagery and live animal encounters. We will explore some real conservation examples using the scientific process.

Strand 1

Concept 3: Analysis and Conclusions Analyze and interpret data to explain correlations and results; formulate new questions.	
Grade 7	Grade 8
PO 7. Formulate new questions based on the results of a previous investigation.	PO 4. Formulate a future investigation based on the data collected.

Strand 2

Concept 1: History of Science as a Human Endeavor Identify individual, cultural, and technological contributions to scientific knowledge.	
Grade 7	Grade 8
PO 4. Analyze the use of technology in science-related careers.	PO 4. Evaluate career opportunities related to life and physical sciences.

Concept 2: Nature of Scientific Knowledge Understand how science is a process for generating knowledge.	
Grade 7	Grade 8
<i>PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.</i>	<i>PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.</i>
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- **Exploring Evolution**

- Recommended for 9th -12th grade
- Let the power of video, imagery, live animals and interactive games help your students explore important aspects of evolution such as: natural selection, genotypic and phenotypic variation and the influence of environmental factors on species evolution. This program may serve as an introduction or review of these key topics in evolutionary study.

Strand 4

Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.	
PO 1. Identify the following components of natural selection, which can lead to speciation: <ul style="list-style-type: none"> • potential for a species to increase its numbers • genetic variability and inheritance of offspring due to mutation and recombination of genes • finite supply of resources required for life • selection by the environment of those offspring better able to survive and produce offspring 	
PO 2. Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.	
PO 3. Describe how the continuing operation of natural selection underlies a population's ability to adapt to changes in the environment and leads to biodiversity and the origin of new species.	
PO 4. Predict how a change in an environmental factor (e.g., rainfall, habitat loss, non-native species) can affect the number and diversity of species in an ecosystem.	
PO 5. Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology, and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.	
PO 6. Analyze, using a biological classification system (i.e., cladistics, phylogeny, morphology, DNA analysis), the degree of relatedness among various species.	