Academic Adventures – Evolution

Author: Six Flags Great Adventure Education Team

Subject(s): Evolution – Virtual

Topic or Unit of Study: Science: Six Flags Great Adventure & Safari

Grade / Level: K-5

Time Allotment: 2 videos (5-7 minutes each)

Behavioral Objective: SWBAT define EVOLUTION in their own words

SWBAT recall 1 fact about Charles Darwin

SWBAT in their own words describe NATURAL SELECTION

SWBAT give 1 example of ARTIFICIAL SELECTION

SWBAT explain the FOUNDERS EFFECT in their own words by recalling the animated example from the video

SWBAT recall 1 example of COEVOLUTION

SWBAT recall that genes/DNA can be studied to see how closely related animals are

SWBAT compare/contrast PALEONTOLOGIST vs. GENETICIST

SWBAT explain HOMOLOGOUS STRUCTURES by recalling the hand/flipper example

SWBAT provide 1 example of CONVERGENT EVOLUTION

SWBAT look at animals to compare/contrast different features

SWBAT explain how scientists compare animals

Standards: **New Jersey State Learning Standards**

Subject: **Science Grades K-5**

- 2-PS1: **Matter and It's Interactions**
  - 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observational properties
- 2-LS2: **Ecosystems: Interactions, Energy, & Dynamics**

- 2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats

- 3-LS3: **Heredity: Inheritance and Variation of Traits**
  - 3-LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms
  - 3-LS3-2: Use evidence to support the explanation that traits can be influenced by the environment
- 3-LS4: **Biology Evolution: Unity and Diversity**
  - 3-LS4-2: Use evidence to construct an example for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing
  - 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all
- 4-LS1: **From Molecules to Organisms: Structures and Processes**
  - 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Summary:

The evolution videos 1 and 2 build upon each other to introduce students to the context that follows. The virtual lessons are conveyed with the help of an Animal Educator and various safari animals. This recorded content begins with an educator defining evolution and its origins using examples of Charles Darwin in the Galapagos Islands. Different evolutionary mechanisms will be discussed. Some examples of outside factors influencing evolution will be explored with the use of artificial selection and genetic drift. Genetic drift is further explained with the two major types; the founders effect and the bottleneck effect.

The next topic covered is the affect evolution has on ecosystems. It is explained that often times when one organism evolves it will cause another to change. Coevolution is defined and further explained with interdependence of species. Two types of coevolution are clarified with the use of animal examples. It is restated that evolution can take millions of years to occur but more rapid diversity is explored through examples of adaptive radiation.

Evolutionary theory explains how the diversity of species can be traced back to organisms that have lived in the past. Different types of scientists are discussed and how their occupations help with studying evolutionary theory. Divergent evolution is explored and how it leads to speciation by identifying homologous structures. Homology is shown through the example of sea lion flippers and human hands.

Now that similar evolutionary structures were explained evolutionary differences and convergent evolution will be discussed. Convergent evolution gives way to analogous structures. Analogous structures are further explained between snakes and lizards as well as birds in the ratite family.

Differentiated Instruction: **<u>Students with special education/physical needs:</u>**

Follow I.E.P.s, B.A.P.s, and 504 plans exactly as written with directions and requirements given to S.F.G.A. Education Staff by the teacher or school nurse at least 1 day prior to scheduled session.
All presentations can be provided in written, visual, and verbal formats.

Students that are underserved and at risk for failure:

The entire program will provide students with a new foundation of knowledge to create a schema that may help to increase standardize testing abilities and intrinsic motivations.

English Language Learns:

E.L.L. teachers are encouraged to join for interpretation.

Advanced Learners:

Advanced information and activities can be discussed further with education staff.

Instructional Materials / Resources/ Assessments:

Instructional Materials & Resources:

Virtual lesson necessities, animals, downloadable content, animal facts and information. Concept mastery will be determined by educator and teacher observations of questions and answering abilities throughout the classroom experience.

Assessments:

Presentations are in line with New Jersey State Learning Standards. Teachers are encouraged to review material as it correlates to their own curriculum.