

Academic Adventures – Genetics

Author: Six Flags Great Adventure Education Team

Subject(s):	Genetics - Virtual
Topic or Unit of Study:	Science: Six Flags Great Adventure & Safari
Grade / Level:	6-8
Time Allotment:	3 videos (5-7 minutes each)
Behavioral Objective:	<p>SWBAT explain how sexual reproduction is responsible for offspring receiving traits from each parent</p> <p>SWBAT explain PHENOTYPE in relation to the way an animal looks</p> <p>SWBAT differentiate a LEUCISTIC animal from an ALBINO animal</p> <p>SWBAT compare/contrast DOMINANT and RECESSIVE genes</p> <p>SWBAT provide 1 example of CODOMINANCE</p> <p>SWBAT provide 1 example of INCOMPLETE DOMINANCE</p> <p>SWBAT define MUTATION in their own words and give 1 example</p> <p>SWBAT provide 1 example of CROSS BREEDING</p> <p>SWBAT give 1 example of a HYBRID animal and list 1 hybrid</p> <p>SWBAT recall 2 rare fur colorations of Bengal tigers</p> <p>SWBAT create a PUNNETT SQUARE to help predict offspring phenotypes from parental genotypes</p> <p>SWBAT explain in their own words how genotype affects phenotype</p> <p>SWBAT describe the difference between GENE and ALLELE</p> <p>SWBAT explain why some mutations are expressed but not others</p>
Standards:	<p>New Jersey State Learning Standards Subject: SCIENCE Grades 6-8</p> <ul style="list-style-type: none">• MS-LS3: Heredity: Inheritance and Variation of Traits

- MS-LS3-1: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to structure and function of organisms
- MS-LS-LS4: **Biological Evolution: Unity and Diversity**
 - MS-LS4-4: Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment

Summary:

The genetic videos 1-3 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. The recorded content begins with an educator reviewing basic genetic terminology for students to reference throughout the unit. The study of genetics is defined along with the importance of DNA. We then introduce how most animals reproduce and how genes are passed to offspring. Different types of gene combinations are explained as well as how they affect the genotype and phenotype of animals.

The importance of dominant and recessive genes are explained in correlation to phenotypes and genotypes. These are further explored by the use of a leucistic rhea. Leucisim is described and compared and contrasted to albinism. Once students have a working understanding of basic gene dominance, we explain two types of dominance with codominance and incomplete dominance.

Mutations are defined and we discuss how mutations are common and that not all mutations cause notable changes. Safari animals help to showcase that some mutations can cause changes to an animals phenotype. Examples of cross breeding and hybrids are mentioned with the human impacts on genetic variations of species.

Lastly, we talk about how the genotypes of tigers effect the different phenotypes of fur color. A Punnett square is used to demonstrate how the different colors are created by genotype to be expressed in their phenotype. Students are reminded how scientists can use animals' genetic makeup to help conserve species for future generations.

Differentiated Instruction:

Students with special education/physical needs:

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.