

BIOLOGY DAY

Workbook 2014 Edition



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WELCOME AND INTRODUCTION

Thank you for participating in Biology Day at Six Flags Great Adventure & Safari. Our goal is to provide a meaningful program for as many students as possible, providing them with an experience that moves learning out of the text books and into a real life setting. Students will have the opportunity to see how biology concepts apply in the everyday life of our animal care team.

As this program continues to grow, sections and items will be added to the workbook as well as lesson plans that connect to the NJCCS. Teachers are encouraged to submit their ideas to njspecialevents@sixflags.com.

Special Thanks

Tom Paterson Madison High School

David Peranteau Six Flags Great Adventure & Safari

Internet Sources

<http://www.bto.org/volunteer-surveys/gbw/gardens-wildlife/garden-birds/behaviour/plumage/leucism>

<http://www.visionfortomorrow.org/genetics-of-albinism/>

<http://www.webexhibits.org/causesofcolor/71.html>

<http://www.doggenetics.co.uk/pigment.html>

**<http://www.nwf.org/Wildlife/Threats-to-Wildlife/Habitat-Loss.aspx>

* http://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/

Biological Pigments: It's All in the Genes!

There are some animals on the Off Road Safari Adventure that do not have the same **phenotype** as the rest of the members of their **species**! You will recognize them right away because they appear white in comparison to their relatives which are **pigmented**!

During this biological adventure you will be able to distinguish between an albino animal and a leucistic animal!

Warm Up: While you are waiting to board your Wild Safari Vehicle, match the words on the top with their explanations or meanings below.

_____ Allele	_____ Inherited Genetic Condition
_____ Altered gene	_____ Melanin
_____ Amino acid	_____ Melanocytes
_____ Enzyme	_____ Phenotype
_____ Gene	_____ Pigment
_____ Genome	_____ Single gene trait (or protein)
_____ Genotype	_____ Species

- The main pigment found in animals. It is responsible for the color of eyes, skin, hair and fur. It is derivative of the amino acid tyrosine, but it is not made of amino acids.
- Biological catalysts responsible for controlling and maintaining biochemical pathways.
- An area on the chromatin that codes for a specific protein
- Alternate forms of a gene
- The molecule that provides color for skin, hair, fur, feathers, etc.
- A pathological condition caused by an absent or defective gene or by chromosomal aberration.
- The physical appearance of an organism as a result of expressed proteins.
- The alleles present within an organism
- A group of organisms capable of interbreeding and producing fertile, viable, offspring.
- Describes a gene that is somehow different from the most frequently occurring form.
- Specialized group of cells that produce the pigment melanin. These cells contain enzymes that control the biochemical pathway that results in melanin from the amino acid tyrosine.
- Protein that is coded by a single area on the chromatin.
- Building blocks of proteins. There are 20 naturally occurring monomers of proteins.
- The total genetic makeup of a cell.



Leucism or Albinism?

What is the difference between **leucism** and **albinism**? Both are **inherited genetic conditions** and both have differing degrees to which they are expressed.

Albinism – Can occur in humans, fish, birds, reptiles, mammals, and even plants. This inheritable condition can involve a single gene that inhibits the production of melanin or a set of genes that disrupts or inhibits the normal production of melanin. Albino animals have inherited altered genes that do not make the usual amounts of melanin. The altered genes are recessive.

Leucism – This inheritable condition in animals is characterized by reduced pigmentation and caused by a recessive allele. Leucism affects all of the pigments, not just melanin. Leucism can affect the entire animal or it can appear as white patches on a somewhat normal looking animal. Animals with white patches are known as having partial leucism. This condition originates during embryological development when migrating pigment cells originating from the neural crest get interrupted and fail to reach their destinations. The cells not receiving the pigment cells are non-pigmented.

ASK the GUIDES – Don't be shy, our Guides love to answer questions!

1. What are the characteristics utilized to distinguish between leucistic animals and animals that are albino?

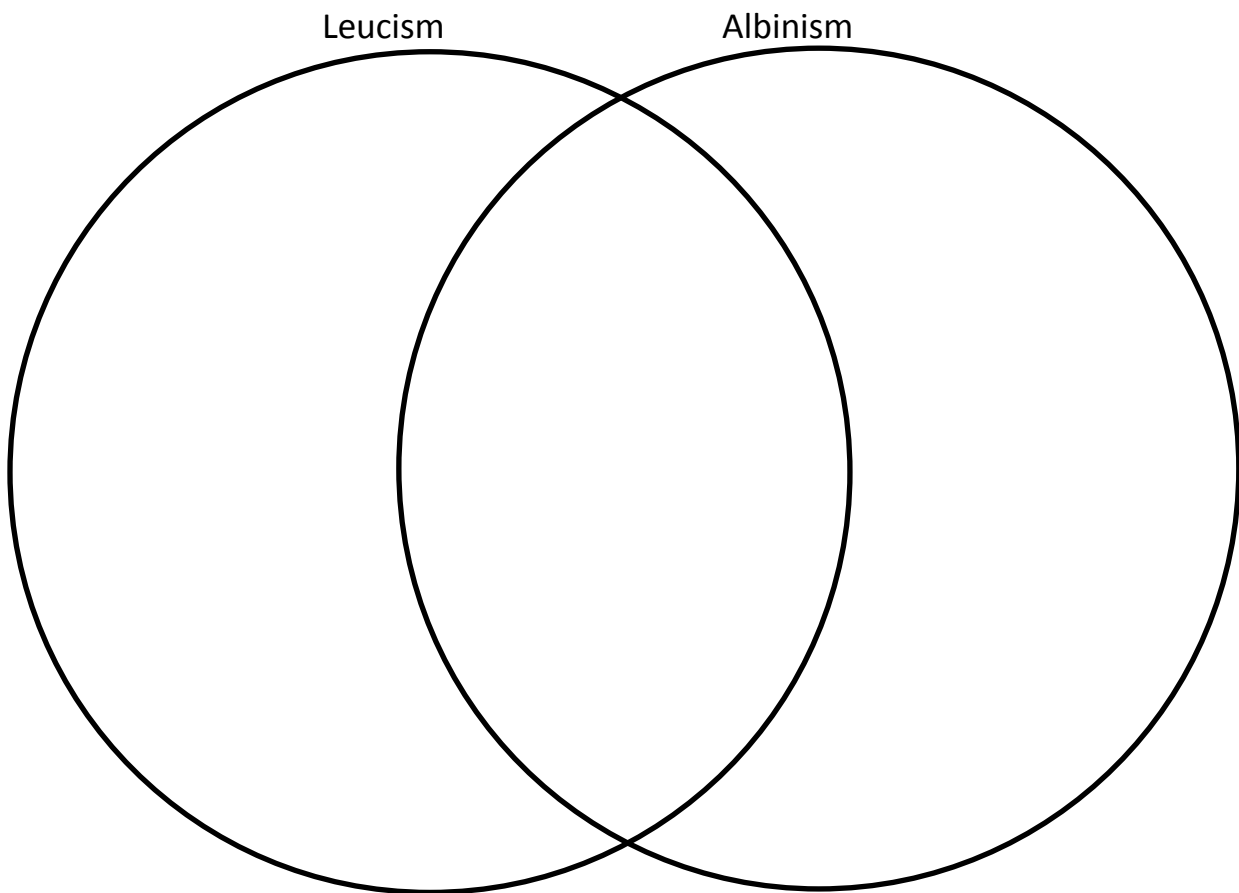
2. Why are leucism and albinism referred to as recessive disorders?



Keep Your Eyes Open! While on this Biological Adventure – Complete the Chart Below:

Animal	Location within the Safari	Leucism or Albinism	Physical description – Phenotype
Rhea			
Peacock			
Burmese Python			

More Practice: Create a Venn Diagram that shows the similarities and differences between leucism and albinism.



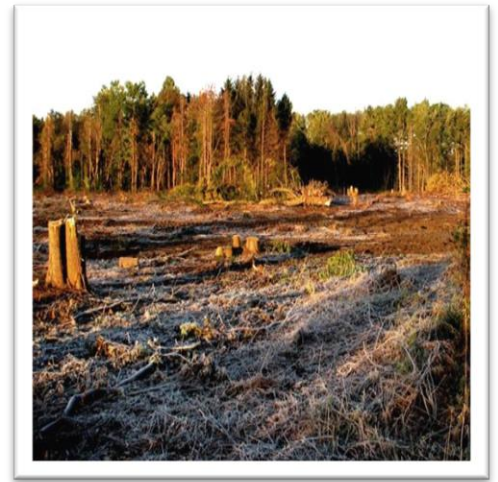
Biological Diversity and Conservation!

Did you know that Habitat loss—due to destruction, fragmentation or degradation of habitat—is the primary threat to the survival of wildlife in the United States?*

Did you know that our planet is now in the midst of its sixth mass extinction of plants and animals – the sixth wave of extinctions in the past half-billion years? We are currently experiencing the worst rate of species die-offs since the loss of the dinosaurs 65 million years ago.*

Did you know that human activities that destroy natural habitats have caused some species of animals in the wild to recently become extinct or nearly extinct?

Did you know that animal care facilities like Six Flags Great Adventure work with zoos and other animal care facilities to help maintain species and possibly reintroduce species into the wild?



ASK the Guides:

1. What does it mean when a species becomes extinct or nearly extinct?
2. Which animals under human care at Six Flags are now extinct in the wild?



3. Which animals under human care at Six Flags were once extinct and were reintroduced into the wild by animal care facilities?
4. Which animals under human care at Six Flags are currently nearly extinct in the wild?
5. What does it mean when a species is endangered?



Complete the Chart Below: Use the information from the Guides to help you complete the chart below.

Animal	Location within Safari	Classify as: -Extinct -Endangered -Nearly Extinct	Reason – Specific Human Activity
	African Section		
	African Section		Horns made from keratin
	Serengeti Grasslands		
	Tigris Asiana		

