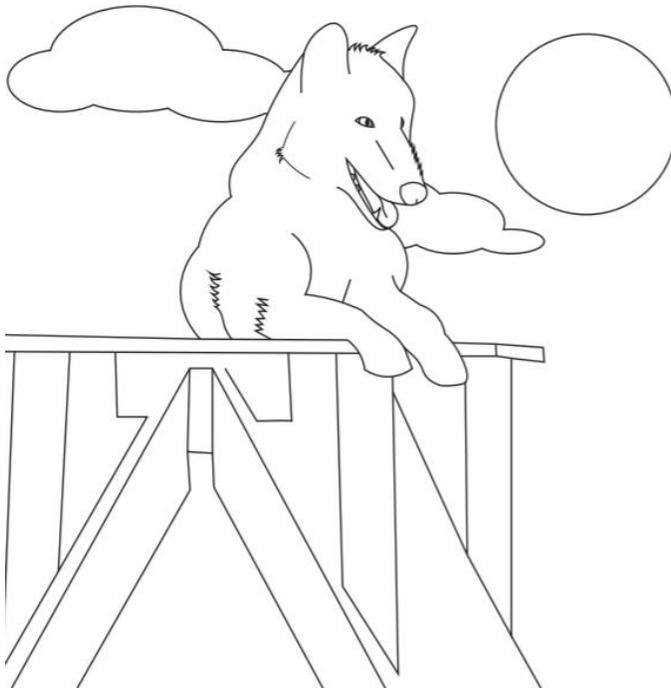


Wolf or Dog

A lesson on genotypes and phenotypes



OCTOBER, 2020

Shy Wolf Sanctuary
Education and Experience
Center
Authored by: April Radcliffe



Genotypes and Phenotypes

Standards

[SC.7.L.16.2](#)

Determine the probabilities for genotype and phenotype combinations using Punnett Squares and pedigrees.

[SC.7.N.3.2](#)

Identify the benefits and limitations of the use of scientific model

Objectives:

GOALS:

Students will develop an understanding of how genetics play a role in determining the phenotype of an individual

Students will verbalize the difference between phenotype and genotype

Students will compare and contrast the phenotype characteristics of a wolf with a dog.

Students will participate in determining traits of a wolf dog by throwing a die

In this genetics lab activity students will flip a coin or roll a dice to create a wolf dog. The lab is based on the genotypes of two parents, one a wolf and one a dog. Based on the genotype of the created pup students can either draw or use clay to model their wolf dog. This activity can be used as an introduction to genetics activity in middle school or as a refresher activity in high school.

Included Resources:

Video links

Data collection sheet

Teacher instructions and presentation

Sample drawing

Vocabulary & Quizlet Review

Notes completed and with blanks.

Topics for further discussion:

Genotype vs. Phenotype

Sibling differences

Identical vs. Fraternal

Ethical issues about manipulating genetics in animals and humans

Captive animal breeding



"TO HEAL HEARTS AND MINDS THROUGH RESCUE, SANCTUARY, AND EDUCATION."

Engage	Begin by showing video about the differences between a wolf and a dog
Explore	Students collect data, creating a wolf dog
Explain	Students answer questions based on their wolf dog offspring.
Expand	Using their data, students will construct models of their offspring
Evaluate	Students check their understanding as a formative assessment (ticket out the door)

Engage	Ask students what the difference is in a wolf and a dog. Answers should reflect one is wild, one is not. Ask, how do they look different?
Introduce:	View the video that shows the differences between a wolf and a dog Reflect on your own heredity. Students create a table that lists characteristics they have and where they may have gotten them. Quizlet Vocab Review Available View the Video on Mendel and genetics https://www.youtube.com/watch?v=Mehz71CxSt&pg=desktop
Ask:	Why did we need to watch a video about long ago to learn about genetics? What is an example from the video of a genotype? What is an example of a phenotype? What is the difference between phenotype and genotype?
Explain	Use presentation go over Phenotype and Genotype. View Video of Wolf Dog Phenotypes Discuss Presentation graphics Tell students they will be designing their own wolf dog mix today using genotypes and phenotypes. Distribute dice or coins to students. Go over instructions on data collection Give the students ten minutes to use die or coins and collect data



Lab Instructions:

Using the table of characteristics and genotypes complete this lab activity. You will either be using a coin or a dice to determine what your wolf dog traits will be. For each section of the table record your coin or dice results on the table below.

Check the table on the next page for what genotype and phenotype your dog will have. Record both the genotype and phenotype in the table.

For example, if you get a five on your dice, for tail, it is an odd number, your genotype is SS, and you will have a straight tail. If you then get a six, for fur your genotype is FF and you will have soft, fluffy fur.

The table below illustrates this example.

	Number Thrown	Genotype of Dog	Phenotype of Dog
Tail	5	SS	Straight Tail
Fur	6	FF	Soft and Fluffy

	Number thrown or Heads/Tails	Genotype of Dog	Phenotype of Dog
Tail			
Fur			
Eyes			
Nose			
Head			
Legs and Paws			
Ears			
Teeth			

	Odd Numbers on Dice Or Heads on Coin	Even Number on Dice Or Tails on coin
Tail	 Stright down, flat SS	Curvy CC 
Fur	 Thick coated, heavy fur HH	Thin, soft, fluffy FF 
Eyes	 Narrow Yellow YY	Round Blue BB 
Nose	 Black KK	Pink PP 
Head	 Long and slender, no mask LL	Definite nose & mask MM 
Legs and paws	 Long legs, big paws EE	Short legs, small paws PP 
Ears	 Small, furry, round RR	Big, Straight RR 
Teeth	 Large Incisors, Large, long jaw II	Smaller Incisors, shorter jaw JJ 

Student Resource Pages

Vocabulary:

Heredity - The passing of traits from parent to offspring

Hybrid - the offspring resulting from combining the qualities of two organisms of different breeds, varieties, species through sexual reproduction

Purebred - The offspring of many generations that have the same traits

Characteristics - distinguishing traits, qualities, or properties

Inherited trait – a characteristic passed from parents to their offspring

DNA - A molecule containing the genetic information that makes up the chromosomes.

Deoxyribose Nucleic Acid

Alleles – different forms of a gene, for example, black, brown hair

Phenotype - An organism's physical appearance, or visible traits.

Genotype - An organism's genetic makeup, or allele combinations.

Sexual reproduction - Reproduction that requires two parent cells; increases variety

Offspring - Product of reproduction, a new organism produced by one or more parents

List your traits and where you believe they came from.

Trait	Inherited From:	Additional Information

Mendel Video Questions:

- 1.
- 2.
- 3.
- 4.

Shy Wolf Video Questions:

- 1.
- 2.
- 3.

Dog vs. Wolf Video Questions:

- 1.
- 2.
- 3.

Notes

_____ is the passing of the physical characteristics from parents to offspring.

_____ a new organism produced by one or more parents.

Scientists use the word _____ to describe the factors that control a trait.

_____ are the different forms of a gene.

An organism's _____ are controlled by the alleles it inherits from its parents. Some alleles are dominant, while other alleles are recessive.

A **dominant allele** is one whose trait _____ shows up in the organism when the allele is present.

A **recessive allele** is _____ whenever the dominant allele is present.

According to Gregor Mendel a _____ organism is the offspring of many generations that have the same form of a trait

A _____ is an offspring that has a dominant and recessive allele for a trait.

A _____ is an organism's physical appearance or traits.

A _____ is an organism's genetic makeup or allele combinations.

Use this space to write your paragraph describing the track patterns on the slide. Explain which track you believe belongs to the wolf and which belongs to the dog and why.

Resources:

Animal Images

<https://pixabay.com/vectors/wolf-animal-canine-cartoon-1295231/>

<https://pixabay.com/vectors/wolf-animal-canine-cartoon-1295230/>

Video: Mendel, <https://www.youtube.com/watch?v=Mehz7tCxjSE&app=desktop>