Genetics

Learn how genetics plays a role in the rabbit industry.

Time

45 minutes total

Materials

- Baby Bunnies Genetics Activity (one per youth member)
- Penny
- Nickel
- Pencils

Space Required

Meeting space with multiple tables.

Before the Meeting

Make enough copies of the baby bunnies genetics activity for each youth members.

Background

Having a good quality rabbit can be dependent on a number of things: proper nutrition, good handling and quality assurance practices, etc. However, genetics plays a role in this as well. It is important for youth members to understand how genetics works if they were interested in breeding their rabbits or even if they are purchasing their rabbits from a breeder. There are certain characteristics that each breed strives to have, and it is a good idea to understand how to get those characteristics in your rabbitry. The Punnett square is a chart which shows/predicts all possible gene combinations in a cross of parents (whose genes are known). It's important for youth to know the difference between dominant and recessive traits, as well as genotype and phenotype. The dominant gene is the one that will be the outcome of the trait. It trumps the recessive gene. The genotype is the set of genes in our DNA which is responsible for a trait. The phenotype is the physical characteristics of that trait. If a genotype is heterozygous it possesses one of each allele, and the dominant trait is expressed. A recessive allele is only expressed if an organism possesses two recessive alleles, and that is a homozygous genotype.

Activity Instructions

1. Explain what a dominant and recessive gene is, as well as what a phenotype and genotype is to the youth.
2. Have youth partner up and work on the Baby Bunnies Genetics Activity.
3. When youth have finished, go over hand out and discuss the outcomes of their baby bunnies.

Reflect and Apply Questions

1. What is a dominant trait and a recessive trait?
2. What is a genotype and a phenotype?
3. What is a heterozygous genotype and a homozygous genotype?
4. What does your rabbit look like? What traits did your rabbit end up with?

Other Related Resources:

Baby Bunnies Genetics Activity

References:

https://www.vocabulary.com/dictionary/recessive
http://examples.yourdictionary.com/examples-of-genotype-phenotype.html
https://www.brightstorm.com/science/biology/mendelian-genetics/genotype/
http://utahscience.oremjr.alpine.k12.ut.us/sciber00/7th/genetics/sciber/punnett.htm

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Lesson 5: Baby Bunnies: Discovering Genotypes and Phenotypes

Student Name:_____ Score:_____

Step 1: Obtain a Penny and a Nickel. The penny will be your female genes and the nickel will be your male genes.

Step 2: Using the chart below, flip your "male" and "female" genes to determine whether they will be passing on a dominant or recessive trait. Dominant traits will be "heads" H, and recessive traits will be "tails" h. Using the second chart, after determining the genotype, determine the phenotype of your baby bunny.

Trait	Female	Male	Genotype	Phenotype
Head Shape				
Ear Color				
Ear Shape				
Ear Size				
Eye Color				
Nose Shape				
Whiskers				

Traight	HH	Hh	hh
Head Shape	Oval	Oval	Circle
Ear Color	Black	Spotted	White
Ear Shape	Ears pointed at the top	Ears pointed at the top	Ear rounded at the top
Ear Size	Long (5 inches or more)	Medium (more than 3, less than 5 inches)	Short (less than 3 inches)
Eye Color	White	White with a black center	Black
Nose Shape	Upside down triangle	Upside down triangle	Sideways oval
Whiskers	Straight	Straight	Curly

Step 3: Quickly draw what your new baby bunny looks like.

Step 4: Answer the following questions.

1. Which of the traits are results of dominant and recessive traits?
2. Which of the traits are results of incomplete dominance?
3. Use the class results and determine the ratio of baby bunnies with white, black, and spotted ears.
4. Did our class results show the predicted outcome from a Punnett Square? Explain why or why not.
5. Use the class results and determine the ratio of pointed ear to rounded ears.
6. Did our results show the predicted outcome from a Punnett square? Explain why or why not.

Bellwork:
What is a Phenotype?
What is a Genotype?
What is Heterozygous?
What is Homozygous?
What is a dominant gene?
What is a recessive gene?

Incomplete Dominance Incomplete dominance is a form of intermediate inheritance in which one gene for a specific trait is not completely dominant over the other gene. The results are a combined phenotype.

Example: Snap Dragons- White flowers are crossed with Red flowers. Neither gene is totally dominant, so therefore you get white flowers, red flowers, and some pink flowers.

LESSON 5

Genetics

Learn how genetics plays a role in the rabbit industry.

REFLECT AND APPLY ANSWER SHEET

Reflect and Apply Questions

1. **What is a dominant trait and a recessive trait?**
   A dominant trait is one that will most likely be the outcome of a trait. It usually trumps the recessive gene. The recessive gene is the one that usually will not be the outcome of the trait.
2. **What is a genotype and a phenotype?**
   The genotype is the set of genes in the DNA which is responsible for the trait. The phenotype is the physical characteristics of the trait.
3. **What is a heterozygous genotype and a homozygous genotype?**
   A heterozygous genotype possesses one of each of the alleles and the dominant trait is expressed. A recessive allele is only expressed if an organism possesses two recessive alleles, and that is a homozygous genotype.
4. **What does your rabbit look like? What traits did your rabbit end up with?**
   Answers will vary depending on coin flipping exercise.

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