Make a Monster

Punnett Square Virtual Lab

Accessed at http://www.glencoe.com/sites/common_assets/science/virtual_labs/E09/E09.html

Heredity

How are traits passed from parents to offspring?

A trait is a characteristic such as color or size that is inherited by an offspring from its parents. The genes that control a trait come in pairs, one gene from each parent. We represent these gene pairs by writing a combination of two capital or lowercase letters. For example, if one parent contributes a gene for blue eyes (C), and the other parent contributes a gene for brown eyes (c), then we write the offspring's eye color trait as Cc. This combination of the two genes that determine the trait is called a genotype.

Each letter in a gene pair stands for one form of the trait. The forms of a trait are called alleles. In this example, the alleles are blue eye color and brown eye color.

The two types of alleles are dominant and recessive. A dominant allele is written as a capital letter, and a recessive allele is written as a lowercase letter. If a gene pair contains a dominant allele, then the offspring will show this dominant trait. Recessive alleles can only show up when there is no dominant allele present to suppress them. The form that shows up is called a phenotype.

In this Virtual Lab you will use a Punnett square to find possible gene combinations and to create a fictitious animal.

Pre-Lab Questions:

1. What is a trait?
2. What are genes? How are they related to traits?
3. How are gene pairs written out?
4. What is a genotype?
5. What are dominant and recessive alleles? How are they written out?
6. What is a phenotype?

Objectives:

Identify the phenotypes of offspring from • a genetic cross.
• Use Punnett squares to identify the outcomes of genetic crosses.

Procedure:

1. Click the Video button. Watch the video about Punnett squares. Write your observations.
2. Select a trait from the list of six traits (eyes, ears, nose, mouth, fur, and feet).
3. Click the Perform the Genetic Cross button to cross the pairs of alleles. This will set up the Punnett square showing the four possible genotypes.

4. Click and drag Possible Phenotypes into the boxes of the Punnett square. If you want to change your selection, first drag the previous phenotype out of the Punnett square.
5. After you have filled all four boxes of the Punnett square, click the Check button to check your matches. Incorrectly matched phenotypes will be highlighted in yellow. Correct your matches and click the Check button again.
6. When the Punnett square is correctly filled in, select one of the four boxes to apply that trait to the mystery animal.
7. Repeat the above procedure for each of the six traits. Record your findings in your Table and answer the questions.
8. You can reset your mystery animal by clicking the Reset button. This will erase all your data and give you a new mix of genes to work with.

Table.

Trait	Selected Genotype	Selected Phenotype

Conclusion Questions.
1. Draw a picture of your animal. Label all of the phenotypes. What are the genotypes behind each phenotype?
2. What is the difference between a genotype and a phenotype?
3. How are alleles and traits related? Explain using an example.
4. In pea plants, purple flower color (P) is a dominant allele, while white flower color (p) is recessive allele. If a pea plant has the genotype Pp, what is its phenotype? Explain your answer.