Lab # _____ Corn

Lab Instructor _____ Name _____
Date _____ Period _____

Objective: ***To study Mendelian inheritance in corn***

*** *Use full sentences when answering all questions.* ***

Background

Each kernel on an ear of corn is one offspring that resulted from sexual reproduction. One gene is responsible for kernel color. The allele R, which is dominant, is responsible for a dark purple kernel, and the allele r, which is recessive, is responsible for a yellow kernel.

Corn plants for which the color genotype is known can be used in specific genetic crosses, in a manner similar to that used by Mendel with pea plants. The ears of corn used in this lab are the offspring of crosses between corn plants that are heterozygous for kernel color, and again, each kernel is one offspring from the cross.

PRE-LAB

1. What is the genotype for a corn plant or a kernel that is heterozygous for kernel color? What is the phenotype for a heterozygote?

2. What are the two different possible genotypes for a kernel that is purple?

3. What is the phenotype of a kernel that is rr?

4. What are the genotypes of the two corn plants that when crossed result in 100% heterozygous offspring? Draw the Punnett square for this cross.

LAB

Materials

An ear of corn that is the offspring from a cross between two corn plants heterozygous for kernel color

Procedures

1. Work in pairs. One student will count kernels, the other will record the numbers.
2. Moving along each row, count the number of purple and the number of yellow kernels, using as many rows as necessary. Count a total of about 200 kernels.
3. Write your data below and on the chart on the blackboard. Additionally, write the class totals below.

Observations

YOUR DATA		CLASS TOTAL DATA	
Number of purple kernels	Number of yellow kernels	Number of purple kernels	Number of yellow kernels

Name _____

Period _____

POST-LAB/CONCLUSIONS

1. A cross is perfomed between two corn plants that are heterozygous for kernel color.
   a) Draw the Punnet square for this cross

   b) What is the expected ratio for genotype in the offspring? For questions 1b) and 1c) be sure to specify what the numbers in the ratios indiciate.

   c) What is the expected ratio for phenotype in the offspring?

2. Compare your collected data with the expected phenotypic ratio from the Punnett square above. Did you see the expected phenotypeic ratio in your data? Did you see the expected ratio in the class total data? Which set of data came closest to the expected ratio?

3. Mendel counted thousands of pea plants for each cross in his experiments in order to make his conclusions. Why did he need to count so many? What could you do to more closely approximate the expected ratio?

4. By observing the expected ratio, explain how we have demonstrated Mendel's law of segregation.