WORKSHEET #1 **Trait Inheritance - Observations**

NAME_____

Date planted: _____

What was the color of the seed planted (phenotype)?

A: yellow

Use the letter 'y' to denote this gene. The dominant allele is 'Y'. The recessive allele is 'y'.

What are the possible genotypes of the seed for this trait?

A: YY, Yy, yy We do not know yet if the yellow allele is dominant or recessive.

From what is observed, can the genotype and phenotype of the parents that made this seed be determined yet? Why or why not?

A: No. Because we do not know if the yellow allele is dominant or recessive. Therefore we don't know the genotype of the offspring (seed planted) and can't determine the genotype or phenotype of the parents.

Half silk date: _____

Harvest date: _____

Collect and record data from a single ear:

How many yellow kernels?

A: Numbers will vary

How many white kernels?

A: Numbers will vary

What is the ratio of yellow to white kernels?

A: 3 yellow:1 white (may need to round or approximate to get exact ratio)

Which allele does this indicate is dominant, yellow or white?

A: yellow

Use the letter ‘y’ to denote this gene. The dominant allele is ‘Y’. The recessive allele is ‘y’.

What would be the genotype(s) of the white kernels? Why?

A: yy. The white kernel color allele is recessive meaning two copies of the allele are necessary for expression of the trait.

Would the genotype(s) be homozygous or heterozygous for this trait?

A: homozygous

What would be the genotype(s) of the yellow kernels? Why?

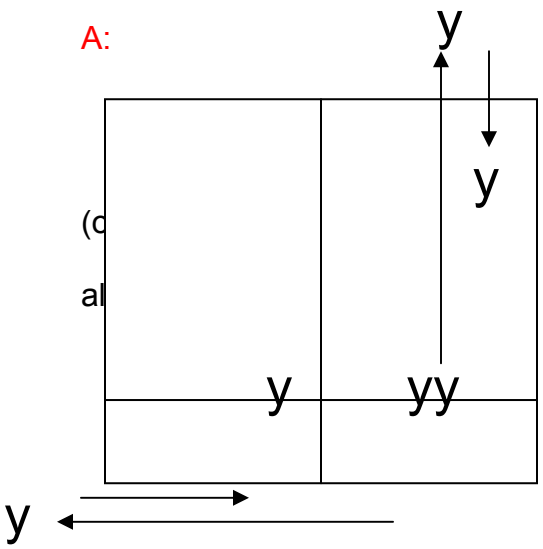
A: YY and Yy. Since they are yellow in color, they obviously have a Y allele. However, the fact that some of the offspring were white, yy, indicates that the parents also had the white allele, y. Therefore, it is possible that some of the yellow kernels have a YY genotype and others have Yy.

Would the genotype(s) be homozygous or heterozygous for this trait?

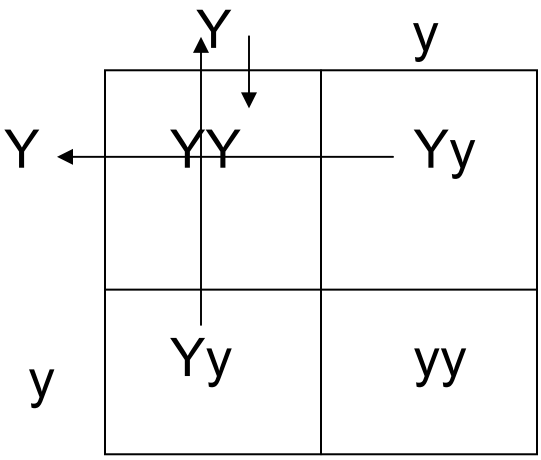
A: some homozygous, some heterozygous

What would the genotypes of the parents be? Use a Punnett square to determine this based on the genotypes of the offspring.

A:



We know that the white kernels are homozygous recessive. Therefore each of the parents had to donate a ‘y’ allele. We can then deduce that two of the other offspring four) also received one copy of the ‘y’



We also know that he yellow kernels must each have a yellow allele giving them the yellow color. Therefore each of the parents
Had to donate a 'Y' allele.

Therefore, the genotypes of both the parents was 'Yy',

What was the phenotype(s) of the parents?

A: yellow

Can you determine if a yellow kernel is homozygous or heterozygous by looking at it?

A: No

How might you be able to determine this?

A: Plant seed from several yellow kernels, self-pollinate them, and look at the kernels of the progeny. If the kernels on a plant are all yellow, the original plant and all the offspring (kernels) are homozygous for the yellow allele. If the kernels have a 3 yellow: 1 white kernel ratio, then the original plant was heterozygous and the offspring (kernels) are a mixture of the genotypes.

WORKSHEET #2 CORN BREEDING – Parts of a corn plant

This worksheet will have an unlabeled copy of the image of a corn plant mentioned in the lesson plan above (yet to be drawn). Students will need to fill in the blanks labeling the different parts of the corn plant (especially focusing on reproductive parts important for breeding)

WORKSHEET #3 Trait Inheritance (year 2) - Observations

NAME_____

Date planted: _____

Date crossed: _____

Half silk date: _____

Date harvested: _____

	Phenotype	Phenotype crossed with	Offspring's phenotype(s)	Offspring's genotype(s)	Parent's genotype(s)
Parent #1					
Parent #2					
Parent #3					
Parent #4					