

Virtual Lab – Punnett Squares: Pre-Lab Questions

1. In order to complete a Punnett Square, you need to know the genotypes of both parents. Each genotype consists of a pair of alleles (symbolized by capital or lowercase letters).

Gg x Gg

- a. What are alleles in reality, and where are they located in the cell?

- b. From where or how did each parent receive their alleles?

- c. In the example, how can you describe the genotype of each parent? Do they show the dominant or recessive phenotype?

2. When you set up a Punnett Square for a monohybrid cross, you separate the pair of alleles for each parental genotype.

	G	g
G		
g		

- a. What type of cell division is responsible for separating the pair of alleles, and at what step in this process does this separation occur? (hint: PMAT1 and PMAT2)

- b. What type of cell holds each single allele?

- c. In the example, what percentage of gametes from each parent are expected to carry the dominant allele?

3. You fill in the Punnett Square by “crossing” alleles from each parent, so every cell in the square has two alleles – one from mom, and one from dad.

	G	g
G	GG	Gg
g	Gg	gg

- a. What kind of reproduction is symbolized by a Punnett Square – sexual or asexual? Explain.

- b. Is it possible for two parents to have 4 offspring that do not match the prediction made by the Punnett Square? Why or why not?

- c. In the example, what percentage of offspring are expected to have the dominant phenotype?

Virtual Lab – Punnett Squares: Procedure, Data Collection, and Analysis

1. Use the Punnett Squares Virtual Lab to complete three scenarios (yellow box, upper left corner).
2. Complete the data table below as you complete each monohybrid cross.

Scenario	Parent 1 Genotype	Parent 2 Genotype	Completed Punnett Square	Ratio of Offspring Genotypes	Ratio of Offspring Phenotype
1					
2					
3					

1. Explain why an organism with a homozygous dominant genotype has the same phenotype as an organism with a heterozygous genotype.
2. Describe how it is possible for two gray flies to produce a black fly.
3. A gray fly is crossed with a black fly, and they only produce gray offspring. Does this suggest the gray fly is homozygous dominant or heterozygous? Explain.
4. If a gray male fly and a black female fly produce a gray offspring, is it more closely related to the male fly? Explain your answer.