

## GENETICS AND PUNNETT SQUARES

1. What are the 2 main purposes of Punnett squares?

- a. \_\_\_\_\_  
 b. \_\_\_\_\_

B = brown eyes  
 b = blue eyes

2. ITEM "A" represents the genetic makeup of a \_\_\_\_\_

3. ITEM "B" represents the genetic makeup of a \_\_\_\_\_

ITEM "A" →

	<b>B</b>	<b>B</b>
<b>B</b>	1. <b>BB</b>	2. _____
<b>b</b>	3. _____	4. <b>Bb</b>

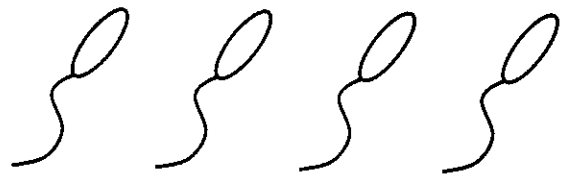
ITEM "B" →

**\*\*\* You fill in squares #2 and #3**

*The following questions refer to the Punnett square above.*

4. What is the genotype of square #1? \_\_\_\_\_
5. What is the phenotype of square #1? \_\_\_\_\_
6. What is the genotype of square #4? \_\_\_\_\_
7. What is the phenotype of square #4? \_\_\_\_\_
8. Which squares are homozygous? \_\_\_\_\_
9. Which squares are heterozygous? \_\_\_\_\_
10. Which square(s) is/are homozygous for brown eyes? \_\_\_\_\_
11. Which square(s) is/are homozygous for blue eyes? \_\_\_\_\_
12. What is the genotype ratio of the above Punnett square? \_\_\_\_\_
13. What is the phenotype ratio of the above Punnett square? \_\_\_\_\_
14. How many alleles are used in the above Punnett square? \_\_\_\_\_

15. What are the different genotypes of the gametes that could come from a male that has the following genotype: Bb. Ee (2N diploid) **Place your answers inside the sperm cells.**



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Crosses Involving One Trait

For the crosses in this activity, we will use some of the traits Mendel observed in garden peas. The expressions of the dominant and recessive alleles for the gene controlling one of these traits are described in the chart below along with the letter symbols that represent each allele.

Remember, the genotype of each plant must have two letters, one representing each allele of the gene for the particular trait. For example, if a seed is round, it could have two possible genotypes – RR or Rr. RR is homozygous, since the two alleles are identical, and its phenotype is round. Rr is heterozygous, since the two alleles are different. Its phenotype is also round because the allele for round seeds (R) is dominant over the allele for wrinkled seeds (r).

For the crosses shown in exercises 1-3, (a) draw a Punnett square in the space provided and write (b) the genotype ratio and (c) the phenotype ratio on the indicated lines.

Trait	Dominant	Recessive
Seed coat shape	Round (R)	Wrinkled (r)
Pod color	Green (G)	Yellow (g)
Height of Plant	Tall (T)	Short (t)
Seed coat color	Brown (B)	White (b)

1. Rr x RR      a. Punnett Square

b. Genotype ratio \_\_\_\_\_

c. Phenotype ratio \_\_\_\_\_

2. Tt x Tt      a. Punnett Square

b. Genotype ratio \_\_\_\_\_

c. Phenotype ratio \_\_\_\_\_

3. White seed plant x heterozygous brown seed plant

a. Punnett Square

b. Genotype ratio \_\_\_\_\_

c. Phenotype ratio \_\_\_\_\_

4. Cross a homozygous green plant with a heterozygous green plant.

a. Punnett Square

b. Genotype ratio \_\_\_\_\_

c. Phenotype ratio \_\_\_\_\_