

Steps for Using a Punnett Square

1. Determine the alleles in the gametes of the parents.
2. Place the alleles of the gametes along the top of the grid as shown. Place the alleles of the second parent along the left side of the Punnett square.
3. Combine the alleles inside the boxes of the Punnett square as shown.
4. Determine the genotypes and phenotypes of the offspring inside the boxes.

Alleles of parents: Rr and Rr

Monohybrid Cross (studies only one trait)

| | | |
|---|----|----|
| | R | r |
| R | RR | Rr |
| r | Rr | rr |

Trait being studied is pea plant seed coat texture.

R = dominant round trait
r = recessive wrinkled trait

Alleles of parents:

YyRr and YyRr

Dihybrid Cross (studies two traits)

| | | | | |
|----|------|------|------|------|
| | YR | Yr | yR | yr |
| YR | YYRR | YYRr | YyRR | YyRr |
| Yr | YYRr | YYrr | YyRr | Yyrr |
| yR | YyRR | YyRr | yyRR | yyRr |
| yr | YyRr | Yyrr | yYRr | yyrr |

Traits being studied are pea plant seed color and coat texture.

Y = dominant yellow trait
y = recessive green trait
R = dominant round trait
r = recessive ~~round~~ wrinkled trait

Monohybrid Cross
(seed color)

| | | |
|----------|----------|----------|
| | Y | y |
| Y | | |
| y | | |

Key: Y = yellow
y = green

Dihybrid Cross
(height and seed coat texture)

| | | | | |
|-----------|-----------|-----------|-----------|-----------|
| | TR | Tr | tR | tr |
| TR | | | | |
| Tr | | | | |
| tR | | | | |
| tr | | | | |

Key: T = tall
t = short
R = round
r = wrinkled

Complete the following.

1. Complete the Punnett square for the monohybrid cross.
2. Complete the Punnett square for the dihybrid cross.
3. Circle the allele of the parent that is heterozygous for seed color in the monohybrid cross.
4. How does a monohybrid cross differ from a dihybrid cross? _____

5. In pea plants, is yellow or green seed color dominant? _____
6. In pea plants, are round or wrinkled seeds dominant? _____
7. Write the genotypes of the offspring that result from the monohybrid cross shown. _____

8. Write the phenotypes of the offspring that result from the monohybrid cross shown. _____

9. How many homozygous yellow offspring will result from the monohybrid cross? _____
10. How many heterozygous yellow offspring will result from the monohybrid cross? _____
11. How many of the offspring produced in the dihybrid cross will be homozygous tall? _____
12. How many of the offspring produced in the dihybrid cross will be heterozygous round? _____
13. Write the phenotypes that result from the dihybrid cross. _____

14. Explain the difference between a phenotype and a genotype. _____
