

# Mendel's Law of Segregation

## Mendel's Law of Segregation

Chapter 11 Sections 1 and 2

Objective:

- A) Summarize Mendel's Law of Segregation
- B) Define monohybrid and dihybrid crosses
- C) List the purpose and steps of completing a Punnett Square
- D) Use Punnett squares to predict genotypic and phenotypic expectations of single trait crosses

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- Obj. A) Summarize Mendel's Law of Segregation – Focus on the F<sub>2</sub>

During the formation of \_\_\_\_\_ (\_\_\_\_\_), the two \_\_\_\_\_ for a \_\_\_\_\_ from each other.

Each gamete carries a \_\_\_\_\_ copy of each \_\_\_\_\_ for a trait are then "\_\_\_\_\_" at \_\_\_\_\_, one from each \_\_\_\_\_ producing the \_\_\_\_\_ for the \_\_\_\_\_ of the \_\_\_\_\_

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A) Summarize Mendel's Law of Segregation

The diagram illustrates Mendel's pea plant experiment. It shows the P Generation (two pea plants, one tall and one short), the F<sub>1</sub> Generation (all tall pea plants), and the F<sub>2</sub> Generation (a mix of tall and short pea plants). Arrows indicate the progression from P to F<sub>1</sub> and then to F<sub>2</sub>.

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Obj B) Define monohybrid and dihybrid crosses

- **Heredity** - passing of \_\_\_\_\_
- **Genetics** - study of \_\_\_\_\_
- **Monohybrid cross** - cross of a \_\_\_\_\_ trait, proves \_\_\_\_\_ law  
e.g. \_\_\_\_\_
- **Dihybrid cross** - cross of two \_\_\_\_\_, proves \_\_\_\_\_  
e.g. \_\_\_\_\_

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Obj C) List the purpose and steps of completing a Punnett Square

**Used to predict** \_\_\_\_\_ outcomes

**Gives a** \_\_\_\_\_ for the \_\_\_\_\_ of a genetic \_\_\_\_\_ = \_\_\_\_\_

The diagram shows a Punnett square for a monohybrid cross. The female gametes (P and p) are listed at the top, and the male gametes (P and p) are listed on the left. The resulting genotypes in the cells are PP, Pp, Pp, and pp.

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C) List the purpose and steps of completing a Punnett Square

1. Make the \_\_\_\_\_. Place \_\_\_\_\_ of \_\_\_\_\_ parent along the \_\_\_\_\_. Place \_\_\_\_\_ of other parent on the \_\_\_\_\_.
2. Fill in the \_\_\_\_\_ like \_\_\_\_\_ tables.
3. Use the Law of \_\_\_\_\_ to determine \_\_\_\_\_. Write the \_\_\_\_\_.

The diagram shows three Punnett squares. The first is for a monohybrid cross (Yy x Yy) with a 1:2:1 genotype ratio. The second is for a dihybrid cross (Yy x Yy) with a 16-cell grid. The third is for a dihybrid cross (Yy x Yy) showing a 3:1 phenotypic ratio (3 yellow peas to 1 green pea).

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# Mendel's Law of Segregation

**P<sub>1</sub> Single Trait Cross** Obj. D) Use punnett squares to predict genotypic and phenotypic expectations of single trait crosses

- Trait: Seed Shape
- Alleles: R – Round r – Wrinkled
- Cross: \_\_\_\_\_ seeds x \_\_\_\_\_ seeds
- \_\_\_\_\_ x \_\_\_\_\_


Genotype Ratio:

Phenotype Ratio:

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**F<sub>1</sub> Monohybrid Cross** Obj. D) Use punnett squares to predict genotypic and phenotypic expectations of single trait crosses

- Trait: Seed Shape
- Alleles: R – Round r – Wrinkled
- Cross: Heterozygous seeds x Heterozygous seeds
- \_\_\_\_\_ x \_\_\_\_\_


Genotype:

Phenotype:

G.Ratio:

P.Ratio:

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**Single Trait Practice** Obj. D) Use punnett squares to predict genotypic and phenotypic expectations of single trait crosses

- Trait: Flower color
- Alleles: P – Purple p – White
- Cross: White flowers x Heterozygous flowers
- \_\_\_\_\_ x \_\_\_\_\_


Genotype:

Phenotype:

Genotypic Ratio:

Phenotypic Ratio:

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**Summary of Single Trait Crosses**

- \_\_\_\_\_ are responsible for all heritable \_\_\_\_\_
- \_\_\_\_\_ is based on \_\_\_\_\_
- \_\_\_\_\_ is based on \_\_\_\_\_, one from the \_\_\_\_\_ and the other from the \_\_\_\_\_
- True-breeding individuals are \_\_\_\_\_ (both alleles) are the \_\_\_\_\_

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**Understanding Check**

**Single Trait Practice**

- Trait: Flower Height
- Alleles: T – Tall t – short
- Cross: Homozygous tall x Heterozygous plant
- \_\_\_\_\_ x \_\_\_\_\_


Genotype:

Phenotype:

Genotypic Ratio:

Phenotypic Ratio:

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