

Assignment 6 - Mendelian Genetics

Essential Question: How do we predict the traits and genes we inherit?

Instructions: Define the following terms.

1. Gene- this is the basic physical and functional unit of heredity

2. Trait- is a specific feature of an organism determined by genes or environment

3. Allele- is a viable coding of the DNA that occupies a specific genetic locus on a chromosome

4. Homozygous dominant- this is a genotype in which all the two alleles are strongly expressed.

5. Homozygous recessive- is a genotype in which the alleles are not expressed

6. Heterozygous- having different alleles for the same gene

7. Contrast **phenotype** and **genotype** by explaining how they are different.
_____genotype is the specific combination of alleles for a given gene while phenotype is the physical characteristics of an organism's allelic combination.

8. Compare and contrast inheritance principles by explaining how the **Law of Segregation** is different from the **Law of Independent Assortment**.

Define the Law of Segregation.

Mendel's law of independent assortment states that the alleles of two different genes get sorted into gametes independently of one another.

Define the Law of Independent Assortment

It states that only one of the two gene copies present in an organism is distributed to each gamete (egg or sperm cell) that it makes, and the allocation of the gene copies is random.

List similarities between the two laws.

1. Law of segregation and law of independent assortment describe the Mendelian inheritance patterns.
2. Both laws describe the inheritance of alleles.

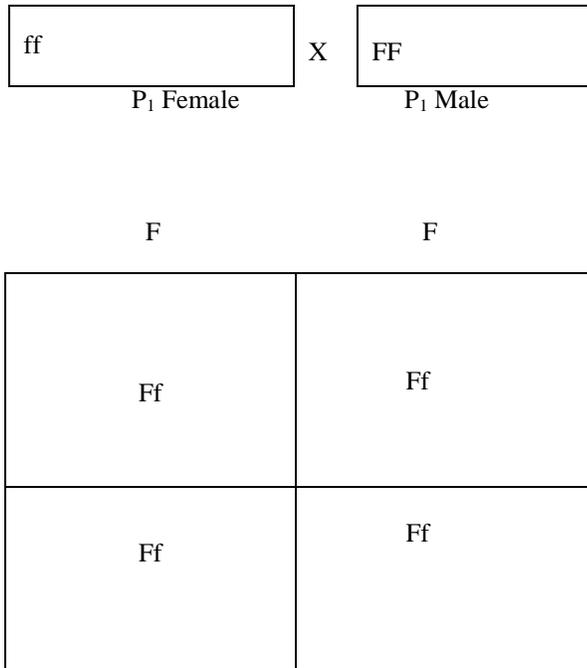
List differences between the two laws.

1. In the law of Segregation, when two alleles for a given trait from the parent are randomly separated into sex cells where as inheritance of one trait that has no influence on the inheritance of a separate traits in Independent Assortment
- 2.

9. Complete the following monohybrid cross using the Punnett square below. A male pea plant with purple flowers (FF) was mated with a female pea plant with white flowers (ff). What is the probability that the offspring will have white flowers?

Gene:	Flower color		
Alleles:	Purple flowers, F		
	White flowers, f		
Genotype	Phenotype	Homozygous Dominant, Heterozygous, or Homozygous Recessive	Ratio of Offspring
FF	Purple	Homozygous dominant	___0___%
Ff	Purple	heterozygous	___100___ %
ff	white	Homozygous recessive	___0___%

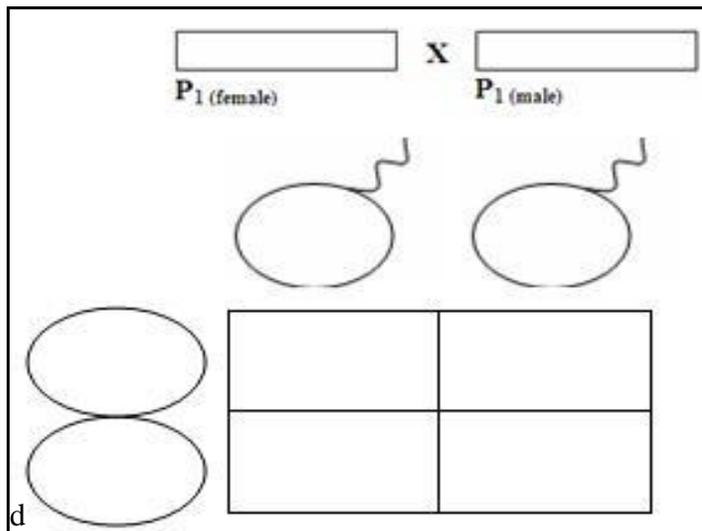


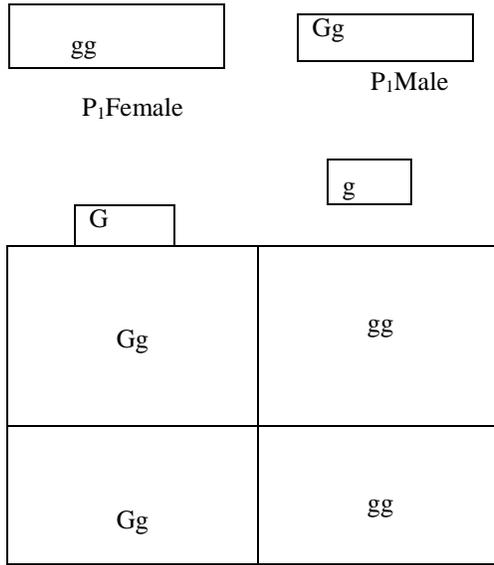


There is a 0 percent chance the offspring will have white flowers.

10. Complete the following monohybrid cross using the Punnett square below. A male fish with green scales (Gg) was mated with a female fish with yellow scales (gg). What is the probability that the offspring will have green scales?

Gene:	Scale color
Alleles:	Green scales, G
	Yellow scales, g





There is a 50 percent chance the offspring will have green scales.