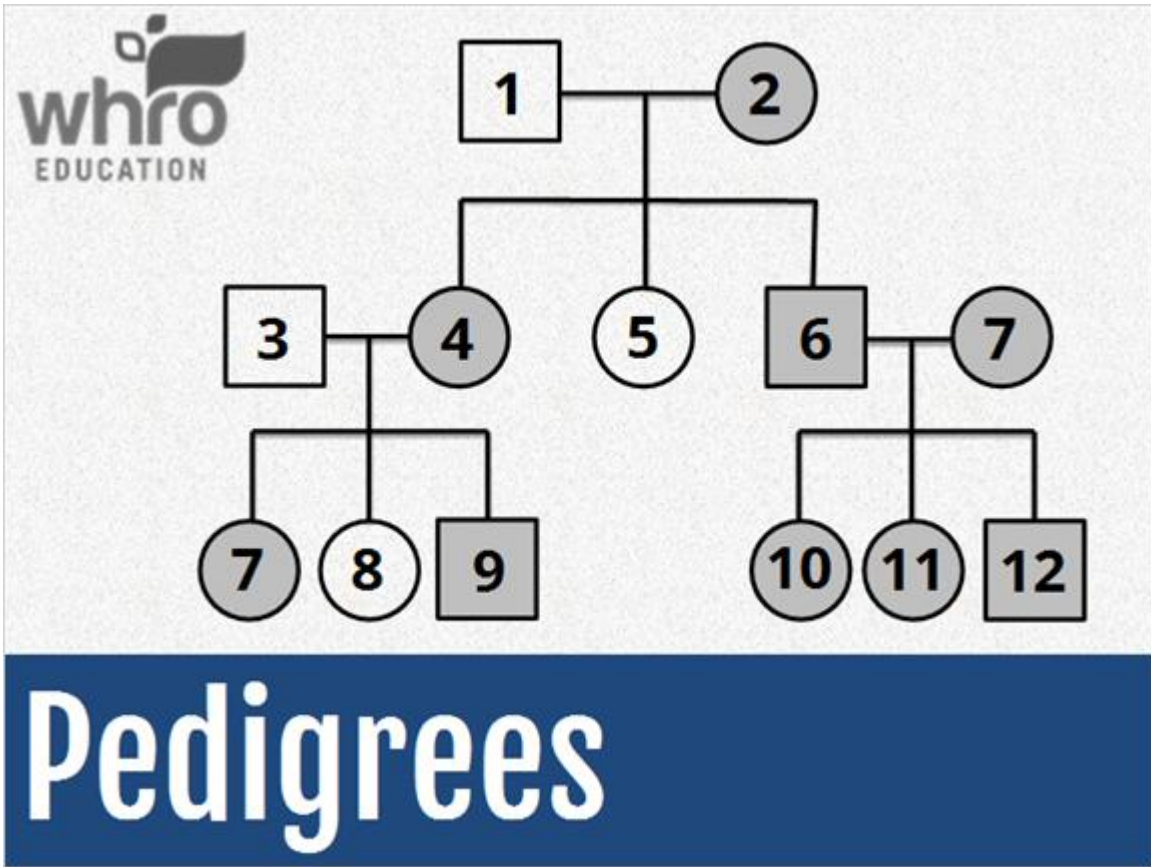


Module 5: Mendelian Genetics and Genetic Disorders  
Topic 2 Content: Pedigrees Notes

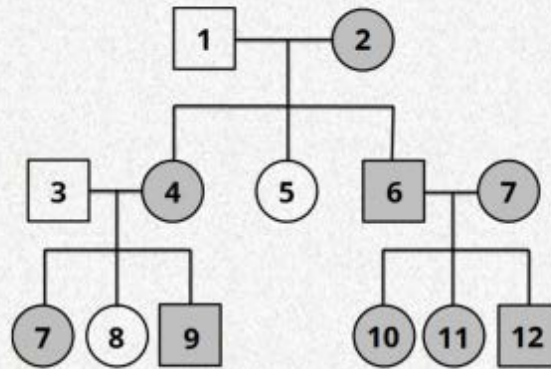


Pedigrees


**Module 5: Mendelian Genetics and Genetic Disorders**  
**Topic 2 Content: Pedigrees Notes**


# Pedigree


a chart used to explain the patterns of inheritance within a family or closed gene pool





*A Pedigree Chart*


 Male without phenotype

 Female without phenotype

 Male with phenotype

 Female with phenotype

 Male carrier without phenotype

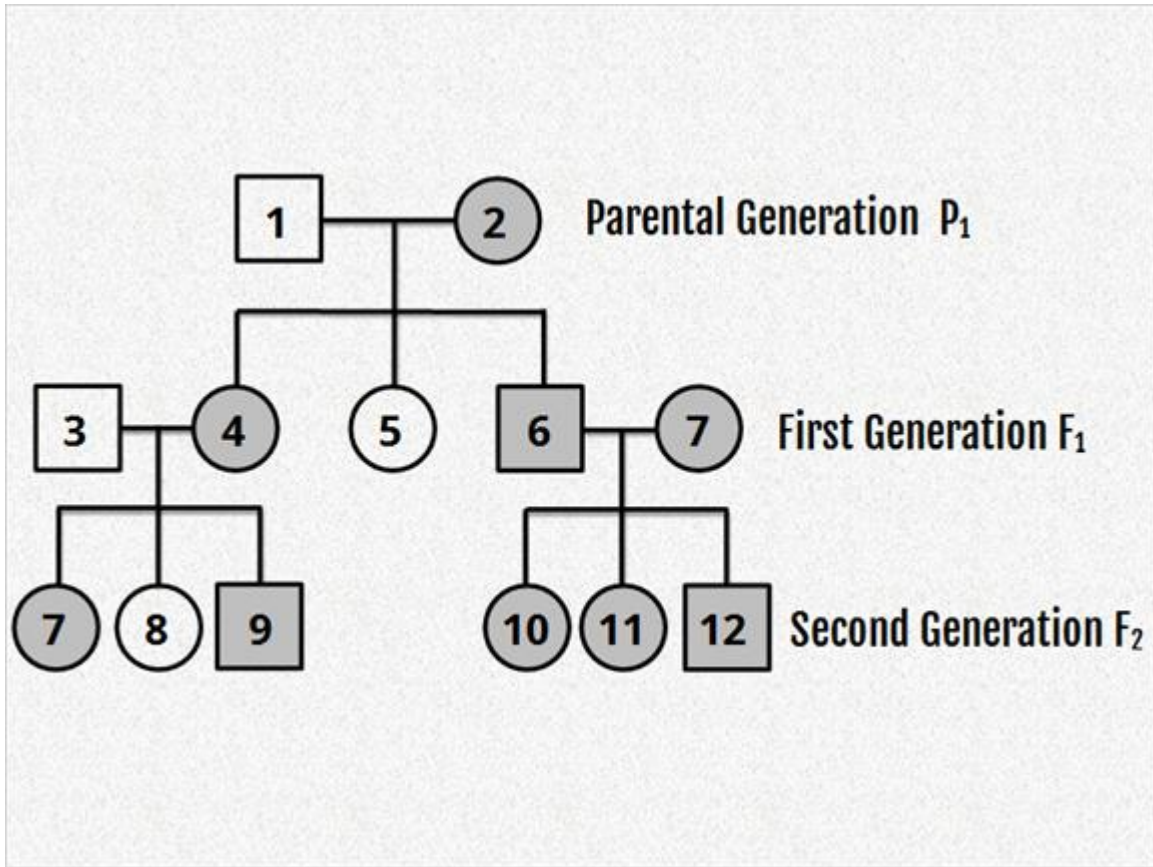
 Female carrier without phenotype

A pedigree is a chart that is used to explain patterns of inheritance within a family or closed gene pool. A pedigree chart is a family tree showing a specific trait that runs in a family that may or may not be passed on from generation to generation.

In a pedigree, individuals in a family are recognized by shapes, shades, and connections with lines. A normal male not expressing a trait is characterized by a non-shaded square. A male expressing a trait is shown by a shaded square. Females are shown by circles. A half-shaded shape indicates a carrier. A carrier is a person who carries the trait and can pass it on to their offspring. Carriers do not express the trait.

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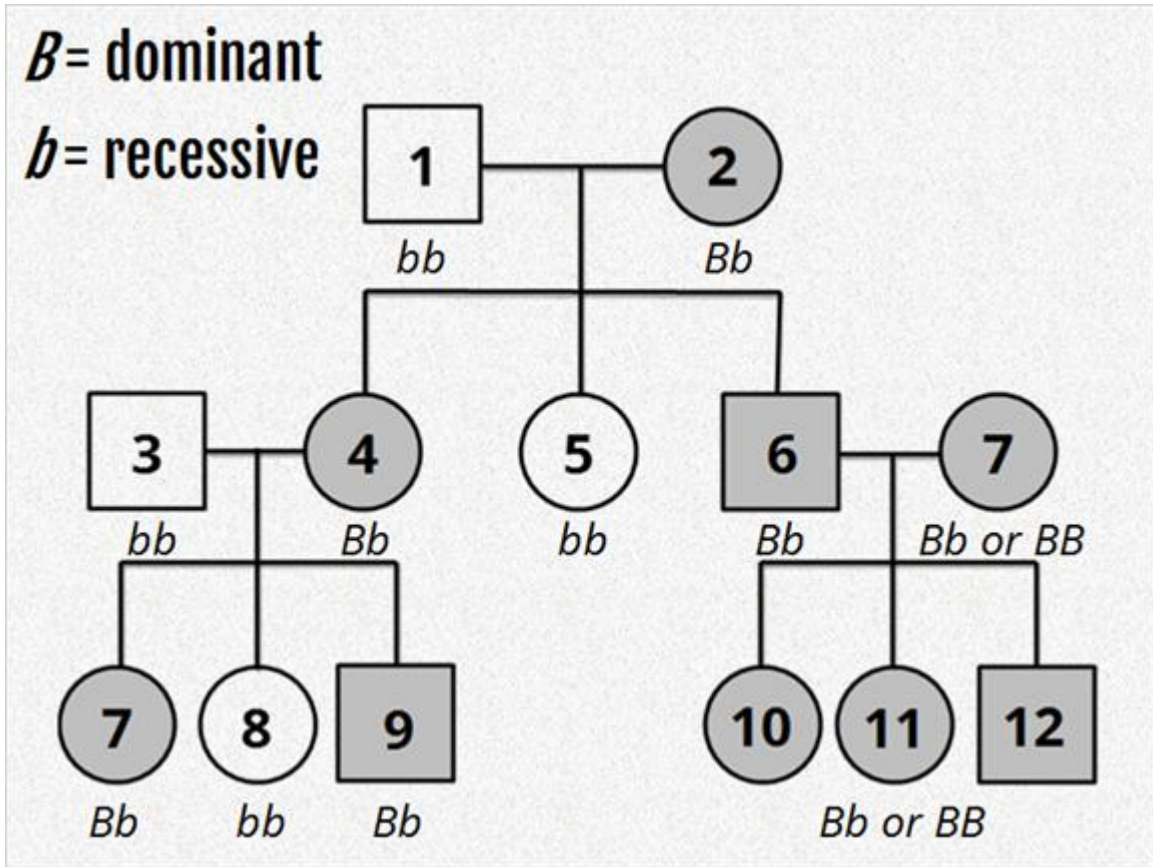
### Topic 2 Content: Pedigrees Notes



In the example pedigree, the top circle and square are the first parental generation, or P<sub>1</sub>. The female expresses the trait and the male does not. They have three children: two girls and one boy. One of the boys and the girl express the trait. This is the first generation, or F<sub>1</sub>.

Both the boy and the girl who express the trait reproduce. The girl reproduces with a male without the trait and the boy reproduces with a girl with the trait. You can see in the second generation, or F<sub>2</sub>, that both couples produced three offspring. Out of these offspring, only one girl does not express the trait.

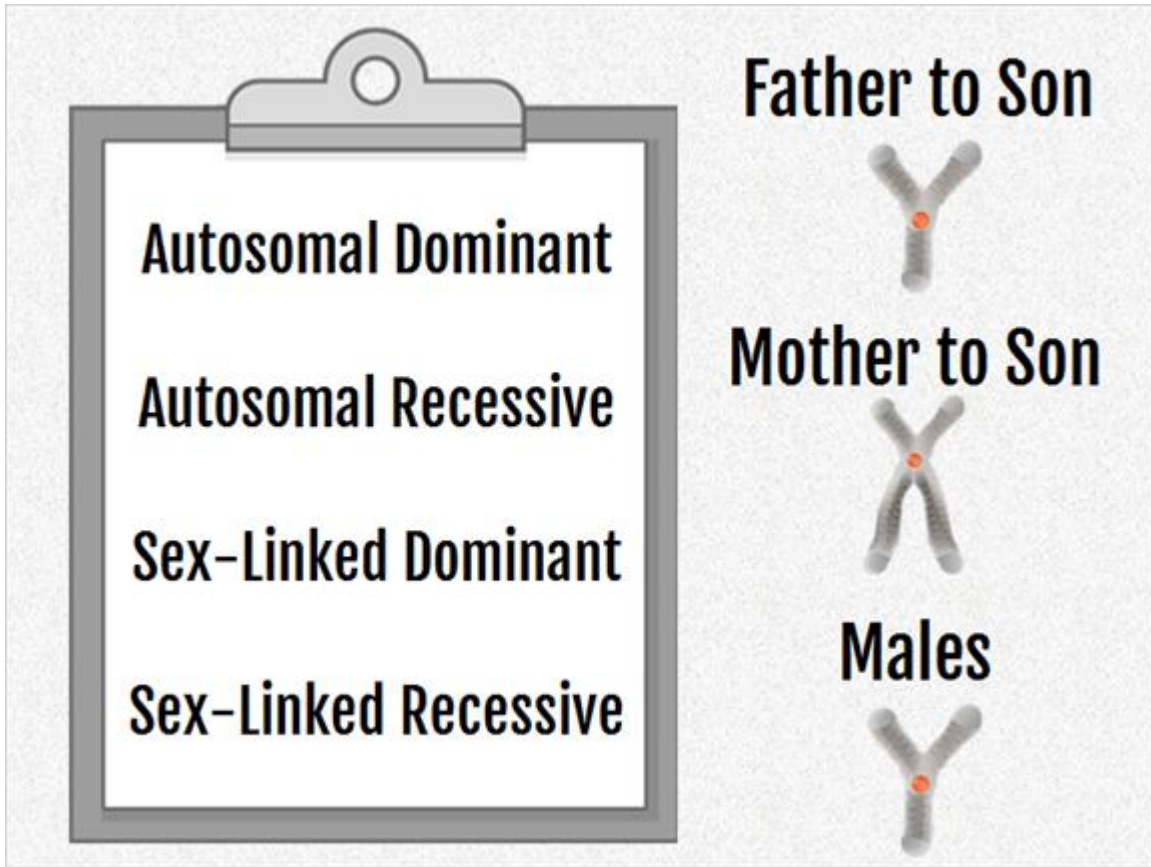
Module 5: Mendelian Genetics and Genetic Disorders  
Topic 2 Content: Pedigrees Notes



From this pedigree, genotypes can be determined. In this example, a capital “B” is dominant and a lowercase “b” is recessive. If the trait being expressed is recessive, then the genotype must be homozygous recessive in order for the trait to be expressed in the phenotype. In a pedigree, the phenotypes are exposed by looking at the shading or non-shading. The genotype is determined by looking at the phenotype of the parents, and remembering that each parent contributes an allele. Take a moment to review all of the possible phenotypes in each generation.

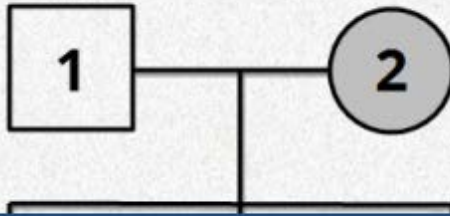


**Module 5: Mendelian Genetics and Genetic Disorders**  
**Topic 2 Content: Pedigrees Notes**



Pedigrees are also used to determine the pattern of inheritance. The pattern of inheritance includes whether the trait is autosomal dominant, autosomal recessive, sex-linked dominant, or sex-linked recessive. If a trait is only passed down from father to son, then it is a Y-linked trait. A trait that is only passed down to sons from their mother is an X-linked trait. If the trait shows up more often in the males of the family, then it is an X-linked recessive trait.

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**Topic 2 Content: Pedigrees Notes**



You have explored pedigrees and their use in the study of genetics. Click **Replay** to restart the interactivity or click **Exit** to close the interactivity.

**Replay**

**Exit**

