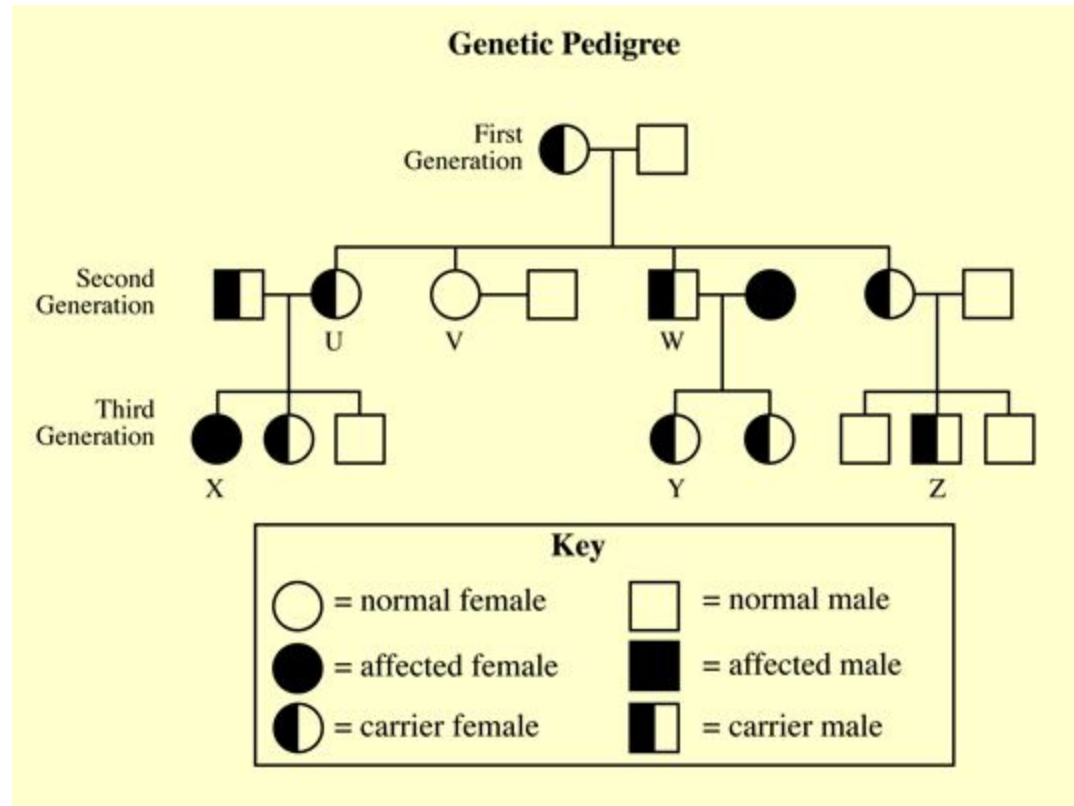


Genetics Study Guide

Vocabulary

- heredity: transmission of traits from one generation to the next
- genetics: scientific study of heredity
- hybrid: offspring of two different varieties
- genetic cross (hybridization): cross-fertilization process
- P generation: parent generation
- F generations: “filial” generations, child generations
- Punnett squares: diagrams used to show possibilities of different gene combination
- phenotype: physical gene expression combinations
- genotype: genetic gene expression combinations
- locus: specific location of gene on chromosome
- allele: sometimes synonymous with gene, a form of a gene that is found in the same place on homologous chromosomes
- gene: “heritable factors” (Mendel)
- character: varying feature
- trait: specific variant of a character
 - can be dominant or recessive
 - some dominant traits:
 - freckles
 - dimples
 - six fingers
 - A and B type blood
 - + Rh factor
 - some recessive traits:
 - no freckles
 - no dimples
 - five fingers
 - o type blood
 - - Rh factor
 - most diseases:
 - tay-sachs
 - cystic fibrosis
 - sickle-cell anemia
 - X chromosome diseases
 - color-blindness
 - baldness
- complete dominance: when there is a dominant and recessive gene, and the the dominant totally overrides the recessive gene; Mendel discovered this
- incomplete dominance: when a dominant gene does not totally override the recessive gene, resulting in a mixing
 - petal color (red + white = pink)
- codominance: when an organism has two dominant genes in which both are expressed
 - blood type (A + B = AB)
- polygenic inheritance: when a gene is controlled by multiple genes

- eye color (two genes)
 - skin color (three genes)
- epistasis: when a gene is controlled by another gene (modifier gene)
 - labrador coat colors
- lyonization: if multiple X chromosome, then all but one become dense Barr bodies
 - calico, tortoiseshell cats
- pedigree: family tree diagram indicating gene inheritance with shaded boxes



Gregor Mendel

- “father of modern genetics”
- German monk
- 1800s, only few years after Darwin’s publication *On the Origin of Species*
- bred peas because it reproduces quickly. has many different varieties, is readily available, and its reproduction could easily be controlled
 - chose seven characters with “true-breeding varieties”
- genetic discoveries:
 - complete dominance:
 - for each characteristic, there are multiple alleles, alternate versions of the genes
 - organisms inherit two alleles from each parent
 - different alleles are “heterozygous”
 - same alleles are “homozygous”
 - law (#1) of segregation: all gametes have exactly one allele for each characteristic, because alleles separate during production of gametes

- law (#2) of independent assortment: all genes are separated and having/inheriting one gene is not always correlated with having/inheriting another