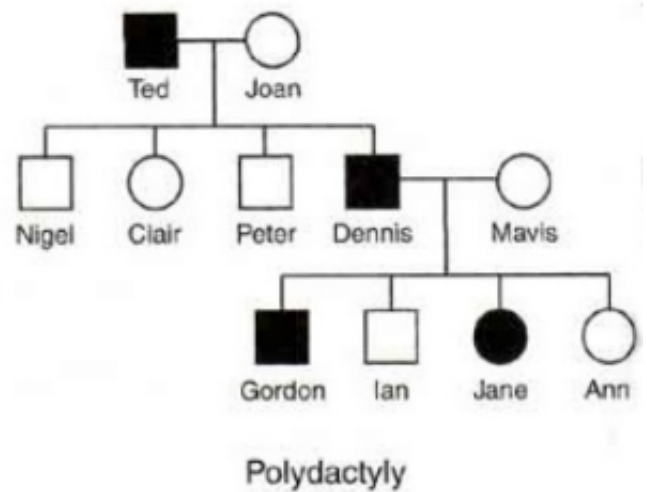
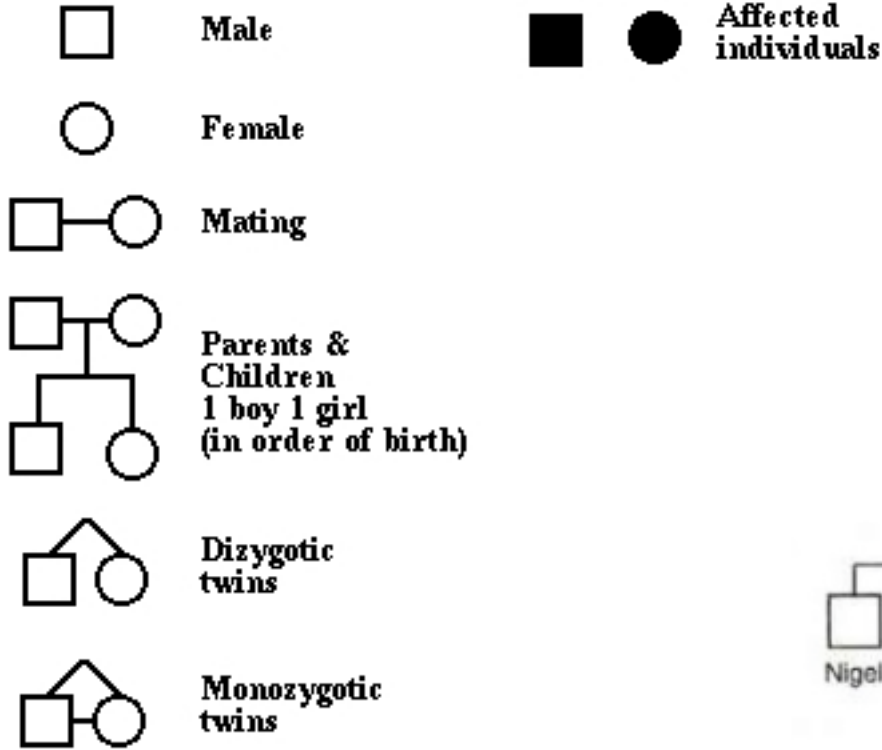


**Pedigree Analysis:** A pedigree is a powerful tool in which a diagram of family relationships uses symbols to represent people and lines to represent genetic relationships. These diagrams make it easier to visualize relationships within families and help us determine the mode of inheritance (dominant/recessive, autosomal/sex-linked) of genetic diseases using either genotype (alleles present in the gene) or phenotype.

**Pedigree Family Tree Symbols**



Polydactyly = extra fingers and toes (digits)

A pedigree is a diagram of how a trait is passed through a family. It can show several generations

Patterns that can show up

1. Autosomal = not on the X or Y chromosome
  - a. Dominant traits
  - b. Recessive Traits
2. Sex linked = gene is on either the X or Y chromosome

- a. X-linked Dominant
- b. X-linked Recessive

## Dominant

Affected individuals have at least one affected offspring

The phenotype appears every generation

Unaffected progeny (offspring) do not transmit the trait to their offspring

Two unaffected parents have only unaffected offspring

## Recessive

Unaffected parents can have affected offspring

Affected progeny are both male and female

Trait may skip generations

## X-linked Dominant

Trait is never passed from father to son

All daughters of an affected father are affected

## X-linked Recessive

Trait is never passed from father to son

Males are more likely than females to be affected

All affected males in a family are related through their mother

Homozygous = both alleles for a trait are the same. This has to be the condition of a gene's alleles for a recessive trait to show up.

Heterozygous = both alleles for a trait are different from one another.

## Questions to ask

1. Does the trait occur In each generation? (dominant)
2. Does the trait appear sporadically? (recessive)
3. Are the affected individuals distributed equally for males and females? (if so, then autosomal – not sex linked)