Chapter 14 – 1 Part 1 Notes: “Pedigree's and Genetic Disorders”

**DNA**

1. In order to show a relationships within a family you would create a __________.
2. A true-breed, or h____________, is represented by the genotypes dd or DD, while a hybrid, or h____________, is represented by the genotype Dd.

**Learning Objectives**

1. **Explain** how pedigrees are used to study human traits.
2. **Describe** examples of the inheritance of human traits.

**Creating a Pedigree**

- A *pedigree* is a chart that shows a family’s relationship and human inheritance.
  - Circles represent females.
    - “Hint: Females are always more rounded”
  - Squares represent males.
    - “Hint: Guys are rough around the edges.”
  - Horizontal lines indicate marriage.
  - A bracket shows parents to children

**Reading a pedigree**

- If a circle or square is shaded the person has the trait/disorder.
- If a circle or square is not shaded the person doesn’t have the trait/disorder.
- What if a circle or square is half shaded?
  - They are a carrier for the trait/disorder

**Types of Inheritance & Disorders**

- **Recessive alleles**: When 2 recessive alleles come together. **Ex:** (hh)
  - PKU/Phenylketonuria: inability to break down the phenylalanine.
- **Dominant alleles**: When at least 1 allele is dominant. **Ex:** (H_)
  - Achondroplasia: Dwarfism; reduced body size.
- **Co-dominant Alleles**: When both alleles appear. **Ex:** (B^S^B^N^)
  - Sickle cell: Misshapen, or sickled shaped blood cells.
- **Sex-Linked**: When an allele appears on the X sex chromosome.
  - Muscular Dystrophy: Progressive weakening and loss of skeletal muscle tissue
1. Draw a pedigree that represents Mary married to Greg, with 2 sons (Scott and Tyler) and 1 daughter (Karen). Please label the pedigree with the names of the people.

2. Draw a pedigree that represents Mary married to Greg, with 2 sons and 1 daughter. Their son, Scott, married April and had Sutton (a boy) and Kendall (a girl). Their daughter, Karen, married Harry and had Eliq (a son) and Tariq (a son). Please label the pedigree with the names of the people.

3. Now you must make a pedigree chart from the descriptions given. Label the pedigree with the names of the individuals. Chad and Veronica got married and had Brittany, Kristin, and Harry. It was discovered that Harry had albinism. Brittany married Larry and had Stephan and Stephanie. Stephan also had albinism. Larry’s brother Barry also had albinism, but neither of their parents had the disorder.

Use the pedigree below to answer questions #4-7 about dimples. The dimple gene controls whether a person has dimples or doesn’t have dimples. No dimples (N) is dominant to dimples (n).

4. How many family members have dimples? _______________
5. What is the genotype of individuals 3 and 4? (3) ___________, (4) ___________
6. Can either individual 8 or 9 be homozygous? (8) ___________, (9) ___________
7. Explain the family relationship between 12 and 2. __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

Answer questions #8-13 using the pedigree chart below. When naming individuals, put their generation first and then their number: Ex. IV-3

8. Which members of the family above are afflicted with Huntington’s Disease?

9. There are no carriers for Huntington’s Disease - you either have it or you don’t. With this in mind, is Huntington’s disease caused by a dominant or recessive trait? _______________
10. How many children did individuals I-1 and I-2 have? _______________
11. How many girls did II-1 and II-2 have? _______________
12. How many have Huntington’s Disease? _______________
13. How are individual III-2 and II-4 related? _______________