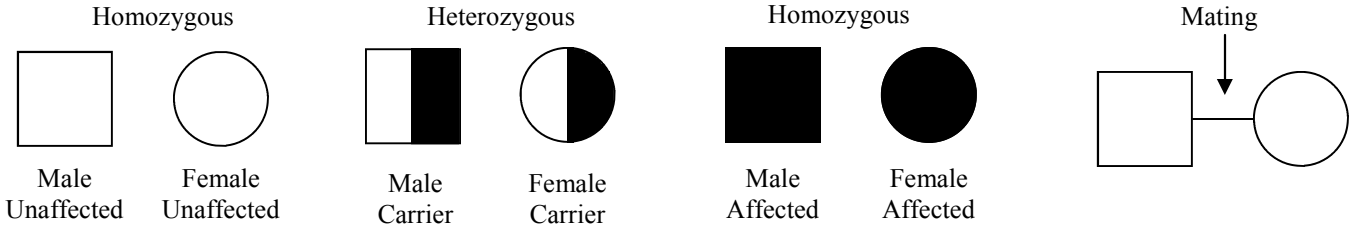
Name _____ Period _____ Date _____

Pedigree Charts

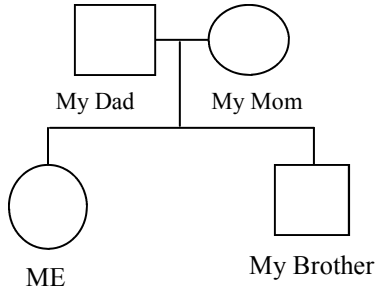
Reading and Working the Charts

Pedigree Charts facilitate the study of human inheritance. A pedigree chart can be used to follow a single trait through several generations of a family. Using a pedigree chart is as easy as looking at a picture. Each set indicates genotype and phenotype of an individual. An empty symbol indicates homozygous dominant; half filled symbols indicate heterozygous; shaded symbols indicate homozygous recessive. Heterozygous individuals are referred to as carriers. A carrier is an individual who carries the allele for a trait but is unaffected by that trait. A horizontal line connecting two symbols shows mating, a vertical line draw from the horizontal line indicates their children. The oldest child will be to the left while twins will be shown with two lines coming off of the same spot. Use the pictures below to answer the first set of questions.



1. Which set of symbols shows males and females that are homozygous? _____
2. Which set of symbols shows males and females that are heterozygous? _____
3. Is a carrier affected by a recessive allele disorder? Yes/ no (circle one)
4. Is a carrier affected by a dominant allele disorder? Yes/ no (circle one)
5. Can a carrier pass a genetic disorder on to their offspring? Yes/ no (circle one)
6. Use the empty box to draw your immediate family's pedigree. Your immediate family equals your mom, dad (even if they are no longer married), you and any siblings (brothers and sisters). Put the children in order from oldest on the left to youngest on the right. Be sure to name each symbol. You are not following a trait so there is no need to shade any symbols. Use my family's pedigree as a reference.

Ms Newsom's Family Pedigree



Your Family's Pedigree Chart

Use Ms Newsom's pedigree chart to answer the following questions.

1. How many children did my parents have? _____
2. My only sibling is male/ female (circle one).
3. My parent's first child was a male/ female (circle one).

Use your pedigree chart to answer the following chart.

1. How many children did your parents have? _____
2. The oldest child is male/ female (circle one).
3. The youngest child is male/ female (circle one).

Pedigree Trends:
Trends within pedigree charts can be easily detected. A sex linked trait disorder, one that is carried on the X chromosome, will cause males to be affected and females to be carriers. For a dominant allele disorder the trend will be that individuals that are carriers are affected. While a recessive allele disorder might skip a generation before it is seen again.

Pedigree Chart #1
Use the following information to construct a pedigree chart. Then fill in the genotypes as given by the information.

The disorder that you are following is Muscular Dystrophy (MD). This disorder is caused by a recessive allele. Use the following allele symbols: D = dominant allele, d = recessive allele

A man and a woman marry and have 4 children. The oldest is a boy, and then they had a girl. Their youngest are twins (paternal), one boy and one girl. The oldest boy married and had a boy. The oldest girl married and had a boy and then a girl. The girl twin is married and is expecting her 1st child.

1. Label the man and woman with 4 children as generation I, their 4 children as generation II and their grandchildren generation III.
2. The female (grandma) in generation I suffers from muscular dystrophy (MD). Fill in her genotype and shade her symbol.
3. The father is test for MD, and he is negative (will not get MD). Fill in his genotype and shade his symbol. Be careful!
4. The oldest boy starts to show signs of MD, which prompts the rest of his siblings to be tested for MD. Fill in his genotype and shade his symbol.
5. The oldest girl and the twin boy are both negative. Fill in their genotype.
6. The twin girl is positive. Fill in her genotype and shade her symbol.
7. None of the in-laws has ever has MD in the family history.

Draw Pedigree Chart #1 Here

Questions regarding Pedigree Chart #1
1. What is the chance that the pregnant twin girl will have a male? Female?
2. If someone is negative for a recessive allele disorder which of the following is their possible genotype(s)?
   Circle all that apply: homozygous dominant heterozygous homozygous recessive
3. What is the likely genotype for all of the in-laws?
   Circle all that apply: homozygous dominant heterozygous homozygous recessive
4. What is the grandfather's genotype? Circle the correct genotype: DD Dd dd
5. Are you able to figure out the grandfather's genotype? How?
6. The siblings in generation II are either affected or carriers. Which parent makes each child a carrier? Mother or father?
7. Which grandchildren in generation III are most likely to get MD?
8. Which grandchildren in generation III are least likely to get MD?