

1. Answer the following concerning sex determination in *Drosophila*.
 - a. What will the fly's gender be if it has the genotype XX and four haploid sets?
1:2 male
 - b. What will the fly's gender be if it has the genotype XXX and three haploid sets?
1:1 female
2. X-linked traits are found on the X chromosome and Y- linked traits are found on the Y chromosome.
 - a. Most sex-linked characteristics are on the X chromosome because there is less genetic material on the Y chromosome.
3. Answer the following about a cross between a man who has red-green colorblindness (an X-linked trait) and a woman who is not colorblind (and has no family history of red-green colorblindness).
 - a. Although the man has an uncle who is colorblind, his mother and father are not colorblind. From which parent did the man inherit the mutated allele?

Colorblindness is a recessive and X-linked trait. Therefore the trait could not be inherited from the father because the father only contains one x and the trait is not expressed. The trait must be from the mother. The mother is heterozygous recessive for the gene therefore it is not expressed phenotypically in the mother.

- b. What is the probability that the couple's daughter will be red-green colorblind?

	B	b
b	Bb	Bb
Y	BY	BY

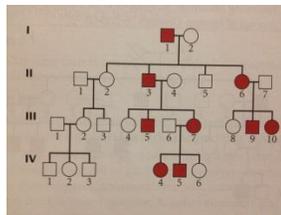
100% carry the genotype but 0% chance of displaying the phenotype

- c. What is the probability that the couple's son will be red-green colorblind?
0 % chance

4. Fill out the chart below.

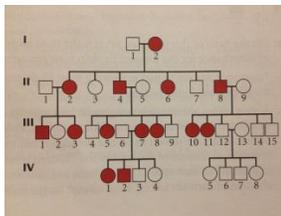
	Definition	Example
Complete dominance	Phenotype of the heterozygote is the same as the phenotype of one of the homozygote.	Mendelian
Incomplete dominance	"Blending" of the 2 phenotypes/alleles, the phenotype falls within a range.	Flowers
Codominance	Both phenotypes can be seen.	Blood type

5. What are 3 factors that complicate the task of studying the inheritance of human characteristics? **Humans are bad model organisms.**
- Controlled mating experience are impossible**
 - Humans have a long generation time, or so tracking the inheritance of traits for more than one generation takes a long time.**
 - The number of progeny per mating is limited, and so phenotypic ratios are uncertain.**
6. When the following modes of inheritance are found on the pedigree chart what can you deduce about the inheritance?
- Autosomal recessive-affects males and females equally from unaffected parents. Often skips generations. Unaffected children are carriers.**
 - Autosomal dominant-affects males and females equally from a single affected parent. Does not usually skip generations.**
 - X-linked recessive- affects males predominantly and is passed from an affected male through his unaffected daughter to his grandson; not passed from father to son.**
 - X-linked dominant- affects males and females; is passed from an affected male to all his daughters but not his sons. Is passed from an affected woman equally to half her sons and half her daughters.**
 - Y-linked inheritance- affects males exclusively; is passed from father to all sons.**
7. What is the mode of inheritance for the following pedigree chart?



Autosomal dominant. The trait must be autosomal because it affects affected male passed it to both sons and daughters. It is dominant because it does not skip generations.

8. What is the mode of inheritance for the following pedigree chart?



X-linked dominant. Affected females can pass the trait to either sons or daughters, however affected males pass the trait only to all daughters.

9. A man with a specific unusual genetic trait marries an unaffected woman and they have four children: two girls and two boys. Fill in the traits for the children that are affected for each mode of inheritance.

