**CH. 14: MENDEL AND THE GENE IDEA**

1. Summarize Mendel’s **Law of Segregation**.
2. Summarize Mendel’s **Law of Independent Assortment**.
3. What is a **test** **cross**?
	1. Brown fur is dominant to white fur in pups. The owner of a brown haired dog wants to know its genotype. What should he do?
	2. Suppose the owner mated his brown haired dog with a white haired dog and 3 of the 6 pups had white fur. What must be the genotype of the brown dog?
4. What is a **monohybrid** cross?
5. What is a **dihybrid** cross?
6. Summarize the **Rules** **of** **Multiplication** and **Rule of Addition** for probability by completing each statement.
	1. If you want to know the chances of event 1 ***and*** event 2, then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ them.
	2. If you want to know the chances of event 1 ***or*** event 2, then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ them.
7. How is **incomplete** **dominance** different from **codominance**?
8. How is **multiple alleles** different from **polygenic** **inheritance**?
9. How is **pleiotropy** different from **polygenic** **inheritance**?
10. Explain **epistasis**.
11. Match each genetic disease with its description.

**TAY SACHS SICKLE CELL HUNTINGTONS CYSTIC FIBROSIS**

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an autosomal dominant disease that causes the deterioration of the nervous system, but doesn’t present until middle age
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the presence of a faulty enzyme leads to buildup of lipids in the brain causing seizures, loss of brain function, and early death
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ results in a buildup thick sticky mucous due to cells being unable to transport chloride ions across the membrane.
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Crescent shaped red blood cells that cause pain and organ damage because the hemoglobin protein (and gene) are mutated.

**CH. 15: THE CHROMOSOMAL BASIS OF INHERITANCE**

1. Draw a diagram that illustrates the **chromosomal theory of inheritance**.
2. What was the contribution of **Thomas** **Hunt** **Morgan** to our understanding of genetics? What did he study?
3. How are X-linked and Y-linked genes different? What do they have in common?
4. Why do we not use the terms homozygous and heterozygous for X-liked traits in males?
5. Identify each **sex-linked disorder** with its description.
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: X-linked disorder whereby blood does not clot normally; missing blood clotting proteins
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: X-linked disorder characterized by muscle weakening and loss of coordination; early death
6. **X-inactivation** regulates [*gene / chromosome*] dosage in [*males / females*]. During [*embryo / gamete*] development one X chromosome is randomly inactivated by [*polymerization / methylation / mutation*]. This results in males and females having the same number of expressed genes with loci on the X chromosome. The inactive chromosome condenses into a \_\_\_\_\_\_\_\_ body.
7. Why do linked genes tend to be inherited together?
8. Define **genetic** **recombination**.
9. What are **parental** **types**? How are these different from **recombinants**?
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can explain why some linked genes get separated during meiosis. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ apart 2 genes are on the same chromosome, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the probability that crossing over will occur between them.
11. What is a **linkage map**?
12. What is **non-disjunction** and when does it occur?
13. Fill in the diagram to show a diploid cell (2n = 6) that undergoes a nondisjunction in meiosis 1. Then draw the same diploid cell as it experiences a non-disjunction in meiosis 2. How do the chromosome numbers of the gametes compare?

**NON-DISJUNCTION MEIOSIS 1 NON-DISJUNCTION MEIOSIS 2**



1. Use the following terms to complete each sentence.

**ANEUPLOIDY POLYPLOIDY TRISOMIC MONOSOMIC**

* 1. If a human diploid cell has 47 chromosomes, then it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for one chromosome.
	2. If a human diploid cell has 45 chromosomes, then it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for one chromosome.
	3. A person with Turners Syndrome or Klinefelters Syndrome both have cells with incorrect chromosome numbers so they are both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	4. A plant cell that has a chromosome number of 3n or 4n is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
1. Label each diagram with the correct type of chromosomal mutation.









1. How are mitochondrial and plastid DNA inherited?

**Use the Pearson Education *AP Test Prep Series for AP Biology* study book to answer the following multiple choice questions. Page 114-116 (1-3, 5-11, 13, 21-22)**

1. \_\_\_\_\_\_
2. \_\_\_\_\_\_
3. \_\_\_\_\_\_
4. \_\_\_\_\_\_
5. \_\_\_\_\_\_
6. \_\_\_\_\_\_
7. \_\_\_\_\_\_
8. \_\_\_\_\_\_
9. \_\_\_\_\_\_
10. \_\_\_\_\_\_
11. \_\_\_\_\_\_
12. \_\_\_\_\_\_
13. \_\_\_\_\_\_

**and page 117 (1-3)**

**and page 118 (5-6)**

1. \_\_\_\_\_\_
2. \_\_\_\_\_\_