

Study Questions from the Text

Chap. 10

1. What does meiosis accomplish? What is a gamete? What do haploid and diploid mean? What is the difference between diploid and $2N$? Is there chromosome duplication before meiosis? What is a chromatid? What are homologs? Why are they called that? Why are the human X and Y chromosomes not homologous? What are "sister" chromatids? What are non-sister chromatids?
2. What does meiosis I accomplish? Why is meiosis II necessary? What is a tetrad? What is independent assortment? What are the phases of meiosis I? Describe what happens during these phases. What is the first big difference between mitosis and meiosis? What are the phases of meiosis II? Describe what happens during these phases. What is crossing over? When does it occur? What is the "value" of crossing over?
3. How much time is there between meiosis I and meiosis II? What is the "value" of independent assortment? How are meiosis and mitosis different in terms of genetic diversity? What evidence is there that genetic diversity and sexual reproduction have an impact on the visible diversity in the living world?
4. How does sex determination in humans relate to chromosomes? How do human egg and sperm formation differ? What is the difference between human eggs and sperms in terms of size, food materials, length of life, etc.? What is a polar body? When can a polar body be formed? What is asexual reproduction? What is a hermaphrodite?

Chap. 11

1. Who was Gregor Mendel? What are the 4 "lessons" derived from Chaps. 9 & 10? What plant did Mendel use in his studies? What does self-pollinate mean? How does that differ from cross-pollinate? How many different varieties did each of the 7 characters Mendel studied come in? Are characters the same as traits? What do phenotype and genotype mean? Why did Mendel start his experiments with "true-breeding" plants? What do "P," F1 and F2 mean? Is it possible to have both yellow and green seeds in the same pea pod? Why?
2. How did Mendel come to the conclusion that some genes were dominant and others recessive? What generation was involved in that determination? What was the phenotypic ratio of the F2 generation of each of the 7 traits he studied?
3. What did he do to get the F3 generation? What did the F3 generation reveal to him? What is the "Rule of Multiplication?" When is it used? What is the "Rule of Addition?" When is it used?
4. What is the law of segregation? What do homozygous and heterozygous mean? What is the difference between "monohybrid" and "dihybrid?" What does a 9:3:3:1 ratio mean? From where does it come? What is the Law of Independent Assortment? How does it relate to chromosomes? What is incomplete dominance? What is the example given of that? How does incomplete dominance relate to protein formation? What is co-dominance? How does the human blood type relate to co-dominance? What is an example of multiple alleles? What is polygenic inheritance? What is an example? What

is the relationship between environmental factors and genes? What is pleiotropy? What is an example of it?

Chap. 12

1. Hemophilia, Duchenne muscular dystrophy and red/green color-blindness are all called what? Color vision is dependent on several genes, on which chromosomes are the genes for red/green absorbing pigments located? What is a recessive disorder? How does the red/green colorblind condition relate to chromosomes? Can a normal vision father have a red/green colorblind daughter? Can he have a colorblind son? Explain. What is an autosomal recessive disorder? Name one. What is polyploidy? In what kind of organisms does polyploidy occur without problems? What is aneuploidy? What is its main cause? When in meiosis can non-disjunction occur? What is the most famous example of aneuploidy in humans? What is the chromosome situation in this example?
2. What happens to humans with abnormal numbers of sex chromosomes? What are the 3 major kinds of structural aberrations in chromosomes? What are the possible consequences of these 3 major kinds of structural aberrations? What is PGD? How is it used? How is the inheritance of white eye color in fruit flies explained? Miniature wing and white eye in fruit flies are transmitted together, but not always. Why are they usually transmitted together? Why aren't they ALWAYS transmitted together? Relate the answer to chromosomes.

END.