Test #3 – Chapters 6-7

1. What is the difference between a diploid and a haploid cell? Give an example of each cell.

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2. Fill in the following chart comparing mitosis and meiosis:

|  |  |  |
| --- | --- | --- |
|  | Mitosis | Meiosis |
| Chromosome # of Parent Cells (Haploid or Diploid) |  |  |
| Number of DNA Replications |  |  |
| Number of Divisions |  |  |
| Number of Daughter Cells Produced |  |  |
| Chromosome # of Daughter Cells  (Haploid or Diploid) |  |  |
| Purpose/Function |  |  |

3. A. What is crossing over? B. When does it occur? C. Why does it occur? A.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_B.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_C.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Explain Mendel’s three laws:

A. Law of Dominance\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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B. Law of Segregation\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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C. Law of Independent Assortment\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5. A number of plant species have a recessive allele for albininsm. If a tobacco plant heterozygous for albininsm is allowed to self-fertilize and 500 of its seeds germinate: How many of these offspring will be expected to have the same genotype as the parent plant? How many seedlings will be expected to be white?

6. Explain why sex-linked genes are inherited differently in males than in females. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7. How are codominant and incomplete dominance alleles similar? How are they different?

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8. Humans have a wide range of hair, eye, and skin colors. How does the polygenic nature of these traits explain the wide range of phenotypes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9. About 70% of Americans perceive a bitter taste from the chemical phenylthiocarbamide (PTC). The ability to taste this chemical results from a [dominant](http://www.ksu.edu/biology/pob/genetics/defin.htm#dom) allele (T) and not being able to taste PTC is the result of having two [recessive](http://www.ksu.edu/biology/pob/genetics/defin.htm#rec) alleles (t). Albinism is trait with normal pigment being [dominant](http://www.ksu.edu/biology/pob/genetics/defin.htm#dom) (A) and the lack of pigment being [recessive](http://www.ksu.edu/biology/pob/genetics/defin.htm#rec) (a). A normally pigmented woman who cannot taste PTC has a father who is an albino taster. She marries a [homozygous](http://www.ksu.edu/biology/pob/genetics/defin.htm#hom), normally pigmented man who is a taster but who has a mother that does not taste PTC. What are the [genotypes](http://www.ksu.edu/biology/pob/genetics/defin.htm#gen) of the possible children?

10. Describe the process of meiosis using the following terms: interphase, prophase 1, prophase 2, metaphase 1, metaphase 2, anaphase 1, anaphase 2, telophase 1, telophase 2, cytokinesis, synapsis, crossing-over, sister chromatid, homologous chromosomes, tetrad, haploid, diploid.

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