

III. Genetics: The Science of 1)_____

A. Mendel's Work

- 1. Gregor Mendel was a priest who taught high school. He studied 2)_____ in his garden.**
 - a) 3)_____ - physical characteristics**
 - b) 4)_____ is the passing of traits from parents to offspring.**
 - c) 5)_____ is the scientific study of heredity.**
- 2. Gregor Mendel is known as the "Father of 6)_____."**
- 3. Mendel studied pea plants.**
- 4. purebred- an organism that always produces offspring with the 7)_____ form of a trait as the parent**
- 5. hybrid- an organism that has two different alleles for a trait, such as 8)_____**
- 6. genes- the factors that control traits**
- 7. 9)_____ - the different forms of a gene, such as "blonde hair" or "black hair"**
- 8. Individual alleles control the inheritance of traits. Some alleles are dominant, while others are recessive.**
- 9. 10)_____ alleles are always expressed.**
- 10. 11)_____ alleles are hidden whenever the dominant allele is present.**

B. Probability and Genetics

1. ¹²⁾_____ - is the chance that a particular event will occur.
2. Letters are used to represent genes.
 - a) A ¹³⁾_____ letter represents a dominant gene. (i.e. "T")
 - b) A ¹⁴⁾_____ letter represents a recessive gene. (i.e. "t")
3. ¹⁵⁾_____ - a chart that shows all the possible combinations of alleles from a cross of two parent organisms.
4. ¹⁶⁾_____ - physical appearance for a trait
5. **Genotype**- combination of alleles (the letters) for a trait
6. **Homozygous**- a genotype that has two of the ¹⁷⁾_____ alleles for a trait, such as "TT" or "tt"
7. **Heterozygous**- a genotype that has two ¹⁸⁾_____ alleles for a trait, such as "Tt"
8. ¹⁹⁾_____ - when neither allele is dominant. For example, if F^R =red flowers and F^W =white flowers, a plant with $F^R F^W$ genotype would have pink flowers.

C. The Cell and Inheritance

- 1. The chromosome theory of 20)_____ states that genes are carried from parents to their offspring on chromosomes.**
- 2. Sex cells have 21)_____ the number of chromosomes than normal body cells.**
- 3. 22)_____ is the process by which the number of chromosomes is reduced by half to form sex cells, called sperm and egg cells.**

(This section of the book, Section 3-4, will not be included on the test for the chapter.)

D. The DNA Connection

- 1. Genes (on chromosomes) tell the cell how to make proteins.**
- 2. Making proteins is called protein synthesis.**
- 3. RNA carries the code from the genes in the nucleus out to the cytoplasm of the cell, where the proteins are made.**
- 4. Mutations- changes or "mistakes" in genes or chromosomes**
- 5. If a mutation happens in a sex cell, the mutation could be copied to all of the cells in the new organism.**
- 6. Some mutations cause harmful effects in an organism. These mutations reduce the organism's chances for survival.**
- 7. Other mutations are neutral, or even helpful.**