

Biology I - Unit 5 Study Guide

bio1u5sg (Genetic Code and Heredity)

Big Idea: “DNA contains the instructions for life and gets passed on in unique combinations to offspring”

Study Objectives (things to learn)

1. Provide an example of how **artificial selection** has led to offspring over multiple generations that can be very different in appearance and behavior from their distant ancestors. (“**Dogs Decoded**”)
 - a. Use Mendel's laws to help explain variation in organisms.
 - b. What is being selected for in artificial selection?
 - c. How is this similar or dissimilar to evolution or natural selection?
2. Apply the terms **phenotype**, **genotype**, **allele**, **homozygous** and **heterozygous** in determining the outcome of **monohybrid crosses (Punnett Square Practice)**
 - a. Define the terms.
 - b. Can you set up a **Punnett Square**?
 - c. What can a Punnett Square help you do?
3. Trace the inheritance of a genetic **trait** through the **pedigree** of a family (“**Constructing a Pedigree**”)
 - a. What is a pedigree?
 - b. Apply the rules for creating a pedigree.
 - c. Trace a **trait** through a pedigree.
4. Differentiate between **dominant**, **recessive**, **codominant**, **incomplete dominance**, **polygenic** and **sex-linked traits** (“**Monogenic Traits**”)
 - a. Know terms and how to use them
 - b. Examples in nature
5. Model the structure of DNA. (**DNA Model Project**)
 - a. Who is given credit for uncovering DNA's structure?
 - b. What are **nucleotides**? Describe the three parts of a nucleotide.
 - c. What is meant by complimentary **base pairs**. List the complimentary base pairs.
6. Outline the flow of genetic information in cells from DNA to protein. (“**Cracking the Code**”)
 - a. Describe the importance of the **genetic code**. What's it for?
 - b. What is the purpose of **transcription**? Where does it occur?
 - c. What is the purpose of **translation**? Where does it occur?

Terms to be familiar with:

pedigree polygenic trait codominance incomplete dominance trait hybrid pure-bred dominant
recessive allele homozygous heterozygous phenotype genotype sex-linked trait artificial selection
protein synthesis transcription codon gene translation nucleotide nucleic acid genetic code
Punnett Square artificial selection

Things to do:

- x Resources: Chapters 9, 10, and 12; “Probability of Inheritance”; Online Unit Folder
- x Notebook **10pts**
 - ✓ Notes on Study Objectives (right side)
 - ✓ Summaries/Reflections on study objectives (left side)
 - ✓ “Punnett Square Practice”
 - ✓ “Constructing a Pedigree”
 - ✓ “Monogenic Traits”
 - ✓ “Cracking the Code”
- x DNA Model Project **10pts**
- x **Quiz1** (SO's 1 and 2) **10pts**
- x **Quiz2** (SO's 3 and 4) **10pts**
- x **Quiz3** (SO's 5 and 6) **10pts**
- x DNA and Heredity **Exam 20pts**