

## **Pre-lab** **Genetics: DNA Biology and Technology**

**Goals:**

- DNA serves as the macromolecule of heredity
- The structure of DNA and how it replicates
- Transcription produces mRNA which is then translated into a polypeptide (protein)
- The 3 types of RNA and the role of each in transcription and translation
- The principles of the process of gel electrophoresis to separate of DNA fragments into a DNA fingerprint
- How to interpret a DNA fingerprint

### **Exercise 22 – DNA Biology and Technology (pp. 209-211)**

**Background info:** Read introductory information at the beginning of the exercise and at the beginning of each section. Answer the following questions.

1. Define molecular genetics.
  - The study of the structure and function of DNA.
  
2. What is the importance of DNA replication in your cells?
  - It provides a means and materials for passing DNA from cell to cell and organisms to organisms.
  
3. What are the 4 nucleotides of DNA? What's found in what? In DNA, what are the combinations of complementary base pairs?
  - Adenine, Thymine, Guanine, Cytosine. A-T and G-C.
  
4. What kind of bond exists between complementary bases?
  - Hydrogen bond
  
5. What does the term semi-conservative mean?
  - That means separating half and keeping half. In this specific case, 1 strand of DNA is conserved.
  
6. What are the two parts to protein synthesis? Where does each occur in the cell?
  - Transcription in nucleus and translation in cytoplasm.
  
7. What is transcription?
  - The process of creating (copying) genetic information in the form of mRNA from DNA.
  
8. What is translation?
  - The process of reading the genetic code on mRNA and synthesizing protein according to the code.