

BIOLOGY 11 – PRE-LAB EXERCISE

19

Name: **Answer Key**

Lab Day & Time:

5

DNA & Biotechnology

1. What is molecular genetics? **The study of the structure & function of DNA.**

What is biotechnology? **The manipulation of DNA.**

2. What is DNA replication? **The process of copying a DNA molecule.**

When in the cell cycle does DNA replication occur? **S Stage**

3. What is the monomer of the DNA macromolecule called? **nucleotide**

What are the three parts of the DNA monomer? **deoxyribose sugar, a phosphate, & a nitrogenous base**

Which part of the four different DNA monomers makes them different? **the nitrogenous base**

4. Examine **Figure 19.1** in your *Lab Manual*. Describe the shape of a DNA molecule. **twisted ladder (double helix)**

What part(s) of the DNA monomer make up the “sides” of the ladder? **sugar-phosphate backbone**

What part(s) of the DNA monomer make up the “rungs” of the ladder? **complementary pairs of nitrogenous bases**

What do the G's, C's, T's, & A's in the Figure represent? **the four nitrogenous bases**

What is complementary base pairing?

hydrogen bonding between the nitrogenous bases of two specific nucleotides

What are the rules for complementary base pairing? **A bonds only to T; G bonds only to C**

5. Examine **Figure 19.2** in your *Lab Manual*. Why is complementary base pairing important for DNA replication?

The sequence of bases in each strand of DNA is the template to determine the precise sequence of bases in a new complementary DNA strand as it is synthesized.

6. What is a DNA fingerprint? **Detectable differences in each person's unique genome**

What are the three steps required to get a DNA fingerprint? **fragmentation; electrophoresis; & analysis**

What is a restriction enzyme?

a bacterial enzyme that cuts DNA at a specific sequence of bases (the restriction site)

During electrophoresis, what causes the DNA fragments to move through the gel?

The negatively charged DNA molecule is attracted toward the positive electrode.

What causes different fragments to move at different rates through the electrophoresis gel?

shorter fragments can move faster through the gel, but longer fragments move slower

Examine **Figure 19.13** in your *Lab Manual*. Which Suspect matches the DNA found at the crime scene? **S₃**