**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **DNA, RNA and DNA Replication**

**A: Nucleic Acid Structure**

1. Define the following terms in **your own words** a. DNA
 b. RNA
 c. Nitrogenous Base
 d. Double helix
 e. Hydrogen bond
 f. Phosphate
 g. Pentose sugar
 h. Nucleotide

2. Complete a Venn Diagram to compare and contrast DNA and RNA:



RNA

DNA

3. List the 4 Nitrogenous bases in DNA and state the complimentary base pairing rule:
 a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is abbreviated \_\_
 b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is abbreviated \_\_
 c. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is abbreviated \_\_
 d \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is abbreviated \_\_

The complimentary base pairing rule states that \_\_\_ always bonds with \_\_\_ and \_\_\_ always bonds with \_\_\_ in DNA. It's the same with RNA except that the base \_\_\_\_\_\_\_\_\_\_ replaces \_\_\_\_\_\_\_\_\_\_\_ so that \_\_\_ bonds with \_\_\_.

4. Which are stronger, hydrogen bonds or covalent bonds? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Draw a DNA nucleotide and identify where covalent bonds are and where a hydrogen bond would form.

6. What is the structure of DNA called? \_\_\_\_\_\_\_\_\_\_\_\_Is it single or Double standed?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. List the 3 parts of a DNA nucleotide: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Which parts are on the outside of a DNA molecule? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Which parts are on the inside of a DNA molecule? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. What is the complimentary strand of DNA for ACCGTA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. List the 3 parts of a RNA nucleotide: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What types of bonds are between nitrogen bases in DNA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Are these bonds weak or strong? \_\_\_\_\_\_\_Why is this important?\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. What types of bonds are between deoxyribose and phosphate molecules in DNA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Are these bonds weak or strong? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**B: Replication**

1. **In your own words using less than 5 words,** define **Replication.**
2. **List the 3 steps of DNA replication.**

3. Replication is a process that's not part of DNA's everyday function. Instead, it's only used in preparation for 1 important cell process that we've learned about. What is that process? ­­­­­­­­­­­\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Play the simulations and animations on Replication at:

<https://www.youtube.com/watch?v=dKubyIRiN84>

<http://highered.mheducation.com/sites/0072943696/student_view0/chapter3/animation__dna_replication__quiz_1_.html>

 **Sketch** and describe a replication fork. Why is "fork" an appropriate name?

5. What biochemicals (from the Biochemistry Unit) support the process of replication by doing things like untwisting/re-twisting DNA, positioning new nucleotides, proofreading the new strand, etc?

6. Replication is said to be a **semi-conservative** process. What does that mean? (Hint: think about what it means to conserve something. What's being conserved during replication?)

7. Once DNA is replicated, does it stay in the nucleus or leave? Why?