Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Homework Assignment #3 – DNA Replication and Protein Synthesis (5 pts)**

What does DNA stand for? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What are the four nucleotides that make up DNA molecules?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 DNA replication occurs during the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ phase of the cell cycle. During DNA replication, the enzyme \_\_\_\_\_\_\_\_\_\_\_\_\_\_ unwinds the DNA double helix, while the enzyme \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ creates the complementary strand of DNA by adding new nucleotides to the template strand. The enzyme \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ only move in the 5’ to 3’ direction creating two different complementary strands of DNA. The \_\_\_\_\_\_\_\_\_\_\_ strand grows continuously, whereas the \_\_\_\_\_\_\_\_\_\_ strand is replicated discontinuously as a series of DNA fragments.

In the space provided, write the complementary for the DNA sequence shown below.

 ACCGTTGAATGCCCTAAGGTTAGTA

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What does RNA stand for? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What are the four nucleotides that make up RNA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Protein synthesis begins in the nucleus of the cell where a strand of messenger \_\_\_\_\_\_\_\_ is synthesized from DNA by the enzyme \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a process known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Before leaving the nucleus, the primary transcript goes through processing where non-coding sections of RNA called \_\_\_\_\_\_\_\_\_\_ are removed and the coding sections known as \_\_\_\_\_\_\_\_\_ are strung together to form a completed sequence of mRNA. After leaving the nucleus, the mRNA binds with a \_\_\_\_\_\_\_\_\_\_\_\_\_ in the cytoplasm.

Using the DNA sequence listed below, first write the sequence for the mRNA then write the correct amino acid sequence using the mRNA.

DNA sequence: **ATGCGATGAACGTCC**

 mRNA sequence:

 Polypeptide:

Using the DNA sequence listed below, first write the sequence for the mRNA then write the correct amino acid sequence using the mRNA.

DNA sequence: **TACGCACTTATCGGC**

 mRNA sequence:

 Polypeptide:

A mutation that changes the DNA sequence from TACTAATGTGGC to TACTAATGAGGC it is a considered a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ mutation.

Using the DNA sequence below, create the corresponding sequence of mRNA, then process the mRNA by removing the introns (**bold bases**). After determining the sequence of the processed mRNA, create the correct polypeptide from the processed section of mRNA. Which of the following polypeptides are the result of the processed section of mRNA?

 DNA sequence: **CGCAAG**TACCTT**CGAAAC**GAAGCA

 Unprocessed mRNA sequence:

 Processed mRNA sequence:

 Polypeptide:

Fill in the missing terms in the figure below

Name this process

Name this enzyme





Name this molecule

Name this molecule

Name this “chain” of molecules

Name this part of the organelle

Name this organelle

Name this molecule

Name this process

Name this three-base sequence

Name this part of the molecule