**DNA Structure, Replication and Protein Synthesis Test Extra Review Questions**

**DNA/RNA Structure:**

1. Fill in the lyrics below:

We love \_\_\_\_\_ made of \_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and a \_\_\_\_\_\_\_ bonded down one side

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ make a lovely pair

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ without \_\_\_\_\_\_\_\_\_\_\_\_\_\_ would feel very bare.

1. If you compare DNA to a ladder…. What would the following parts be…
	1. Steps of the ladder (“rungs”) =
	2. Sides of the ladder (“backbone”) =
2. What is the structure seen below called? Label the parts.



1. If the following describe DNA only put a “D” on the line, if it describes RNA only put a “R” on the line, if it describes both DNA and RNA put “B” on the line.

\_\_\_\_\_ Is single stranded

\_\_\_\_\_ Bases adenine bonds with thymine

\_\_\_\_\_ Has a structure like a twisted ladder

\_\_\_\_\_ Is double stranded

\_\_\_\_\_ Bases cytosine bonds with guanine

\_\_\_\_\_ Bases adenine bonds with uracil

\_\_\_\_\_ Can leave the nucleus

\_\_\_\_\_ Contains 4 different nucleotide bases

\_\_\_\_\_ Can’t leave the nucleus

\_\_\_\_\_ The sugar in the nucleotide is ribose

\_\_\_\_\_ The sugar in the nucleotide is deoxyribose

\_\_\_\_\_ Is made up of nucleotides

1. DNA is said to be complementary, meaning if you have one side of the DNA model you should be able to figure out the other side based on the matching base pairs. What are complementary sides to the DNA strands below:
	1. ACTAGG
	2. CTAGAT
2. What are the three information macromolecules?
3. If all the cells in the human body have all the same 46 chromosomes in them… why do we have different types of cells (muscle cells, nerve cells, brain cells etc.)?
4. What do we mean when we say DNA is a universal code?
5. What is a gene?
6. What was the major contribution the following scientist made regarding the DNA structure?
	1. Rosalinda Franklin
	2. Watson and Crick
7. What is a DNA fingerprint?
8. DNA can get “damaged” during replication, transcription or translation… sometimes even when exposed to things like radiation and toxic chemicals…. What is it called?

**Replication:**

1. What is DNA replication? Why would a cell need to do it?
2. What is the enzyme called that unzips the DNA? What is the enzyme called that adds the nucleotide bases?

**Protein Synthesis:**

1. Fill in the blanks below:

The whole process of going from a gene in DNA to a protein that can perform a function is called \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ . If you break it down into the two parts…. Going from DNA to mRNA is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and happens in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Going from mRNA to a protein is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and happens in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. After mRNA leaves the nucleus what organelle does it meet up with to create a protein?
2. What is a protein chain made out of?
3. What is the picture below? Label the amino acid in the picture and the anti-codon.



1. Fill in the blanks below using the words peptide and polypeptide:

A long chain of amino acids is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The amino acids in the chain are bonded together with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bond.

1. Answer the following questions based on the DNA strand below:

TACTGGTTAATG

* 1. What would be the complementary DNA strand?
	2. What would be the mRNA strand that you’d transcribe off of it?
	3. Use your answer from part B and translate it into a protein:
1. Answer the following questions based on the mRNA strand below:

AUGACCAAUUAC

* 1. How many bases are in a codon?
	2. So then… How many amino acids does the mRNA strand above code for?
	3. If this is the mRNA strand…. What would the DNA strand it came from look like?
	4. What would be the anti-codon sequence off of the mRNA strand?
	5. Do you use the anti-codon or the codon on the chart?
	6. Using the mRNA strand given, translate it into a protein:
1. Looking at the picture below and using the word bank given, what do the following numbers correspond to?
2.
3.
4.
5.
6.
7.
8.
9.

Nucleus

Codon

Ribosome

Cytoplasm

Amino Acid

DNA

mRNA

tRNA

