Name _____ Date _____ Class _____

SECTION 3-4 **ENRICH**

The Genetic Code

The genetic code is made up of groups of three nitrogen bases in the messenger RNA. Each three-base group, called a **codon,** codes for one amino acid. The table below shows the genetic code. To find the amino acid that is coded for by the codon UGG in messenger RNA, look in the row of the first base in the codon—U. Then move to the box that is specified by the second base in the codon—G. Finally, look down the list of amino acids in the box until you find the one in row "G," the third base in the codon. You should find that UGG is the codon for tryptophan.

Transfer RNA matches up with the messenger RNA at the ribosome to deliver the correct amino acid to the growing protein chain. Transfer RNA has a three-base code called an **anticodon** that matches up with the codon in the messenger RNA.

Answer the following questions on a separate sheet of paper.

The Genetic Code (messenger RNA)

First Base in Codon	Second Base in Codon: A	Second Base in Codon: G	Second Base in Codon: U	Second Base in Codon: C	Third Base in Codon
A	Lysine	Arginine	Isoleucine	Threonine	A
	Lysine	Arginine	Methionine	Threonine	G
	Asparagine	Serine	Isoleucine	Threonine	U
	Asparagine	Serine	Isoleucine	Threonine	C
G	Glutamic acid	Glycine	Valine	Alanine	A
	Glutamic acid	Glycine	Valine	Alanine	G
	Aspartic acid	Glycine	Valine	Alanine	U
	Aspartic acid	Glycine	Valine	Alanine	C
U	"Stop" codon	"Stop" codon	Leucine	Serine	A
	"Stop" codon	Tryptophan	Leucine	Serine	G
	Tyrosine	Cysteine	Phenylalanine	Serine	U
	Tyrosine	Cysteine	Phenylalanine	Serine	C
C	Glutamine	Arginine	Leucine	Proline	A
	Glutamine	Arginine	Leucine	Proline	G
	Histidine	Arginine	Leucine	Proline	U
	Histidine	Arginine	Leucine	Proline	C

1. If the DNA sequence of a gene was TACTTACCGAGCTAGACT, then what is the sequence of the messenger RNA?
2. Use the genetic code to identify the sequence of amino acids encoded by the messenger RNA that you identified in Question 1.
3. What are the sequences of the anticodons for the transfer RNA molecules that carry each of the amino acids in the protein sequence that you identified in Question 2?
4. How would the protein change if a mutation caused a base to be added, making the mutated DNA sequence TACGTTACCGAGCTAGACT? How is the protein affected by this mutation? (*Hint:* How does the extra letter change the series of bases?)
5. How would the protein change if a mutation caused one base to replace another, making the mutated DNA sequence TACTTACCTAGCTAGACT? How does this mutation affect protein function?