

DNA WORKSHEET

NAME _____

Step 1). **Replicate** the DNA Strand labeled A creating strand B in the left column

Step 2). **Transcribe** DNA Strand A into mRNA codons

Step 3). **Translate** the mRNA codons into tRNA anticodons.

Step 4). **Decode** Use the mRNA codons to find amino acids on mRNA table

DNA Strand B	DNA Strand A	Transcribe mRNA	Translate tRNA	Amino Acid
	T			
	A			
	C			
	G			
	G			
	G			
	C			
	T			
	A			
	C			
	A			
	A			
	C			
	T			
	T			
	A			
	A			
	C			
	A			
	G			
	A			
	C			
	C			
	A			

First Base	SECOND BASE				Third Base
	U	C	A	G	
U	UUU Phenylalanine	UCU Serine	UAU Tyrosine	UGU Cysteine	U
	UUC Phenylalanine	UCC Serine	UAC Tyrosine	UGC Cysteine	C
	UUA Leucine	UCA Serine	UAA STOP	UGA STOP	A
	UUG Leucine	UCG Serine	UAG STOP	UGG Tryptophan	G
C	CUU Leucine	CCU Proline	CAU Histidine	CGU Arginine	U
	CUC Leucine	CCC Proline	CAC Histidine	CGC Arginine	C
	CUA Leucine	CCA Proline	CAA Glutamine	CGA Arginine	A
	CUG Leucine	CCG Proline	CAG Glutamine	CGG Arginine	G
A	AUU Isoleucine	ACU Threonine	AAU Asparagine	AGU Serine	U
	AUC Isoleucine	ACC Threonine	AAC Asparagine	AGC Serine	C
	AUA Isoleucine	ACA Threonine	AAA Lysine	AGA Arginine	A
	AUG START	ACG Threonine	AAG Lysine	AGG Arginine	G
G	GUU Valine	GCU Alanine	GAU Aspartate	GGU Glycine	U
	GUC Valine	GCC Alanine	GAC Aspartate	GGC Glycine	C
	GUA Valine	GCA Alanine	GAA Glutamate	GGA Glycine	A
	GUG Valine	GCG Alanine	GAG Glutamate	GGG Glycine	G

To use the amino acid chart:

Find the first letter of the mRNA codon on the left column.

Find the second letter of the mRNA codon on the upper column.

Draw line from both columns until the lines meet.

Now find the third letter from the mRNA codon in the right column and draw a line until it intersects with the other 2 lines.

Fill in the blank with the terms (1 point each)

Phosphate
Codons
Deoxyribose
Thymine

Bases
Proteins
Complementary

Helix
Amino Acids
Cytosine

1.	DNA molecules contain information for building specific (1). In a three-dimensional view a DNA molecule looks like a spiral staircase; this is correctly called a (2). The constant parts of DNA molecules are the (3) and (4) molecules, forming the DNA-ladder uprights, or backbones. The information of DNA is actually coded in the sequence of nitrogen containing (5), which are bound together to form the “rungs” of the DNA ladder. When the four DNA bases are combined in different three-base sequences called (6), different (7) of the protein are called for. It is said that the N-containing bases of DNA are (8), which means that only certain bases can fit together or interact together. Specifically this means that (9) can only bind with guanine, and adenine can only bind with (10).
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Answer in sentences:

If a structural gene contains 300 DNA nucleotides, how many amino acids will be used in the protein synthesis?

If a protein has 150 amino acids, how many DNA nucleotides would make up the structural gene?

Describe in a sentence the relationship between the gene sequence and the tRNA sequence? (Look at both columns how are they similar or different)
