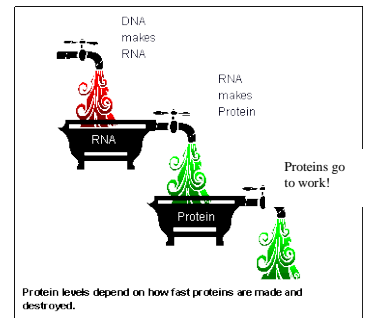


Name \_\_\_\_\_ Period \_\_\_\_\_

# Making Sentences of DNA

**Introduction:** The instructions coded in DNA must be read and turned into protein molecules for the cell to carry out the instructions. In this activity you will model this process using sentences for DNA and RNA and words for amino acids. The words must line up in the correct order for the protein to form properly, just like words in a sentence must line up. Good luck!



**Instructions:**

1. Go to the nucleus and find your DNA strands. Students must write down the DNA template card number, and write down the sequence of the DNA where it says DNA strand in the table. (If make-up assignment the DNA is at the bottom of this file)
2. With the DNA sequences you must now transcribe the DNA into mRNA (the message).
3. You will now translate the message by translating the mRNA into words using the CODON chart.

<b>DNA STRAND 1</b>	<b>TAC-GAT-</b>
<b>(TRANSCRIPTION)</b>	
<b>mRNA STRAND</b>	<b>AUG-CUA</b>
<b>Sentence</b>	<b>The-</b>
<b>tRNA (ANTI-CODON)</b>	<b>UAC-</b>
<b>Actual Amino Acids</b>	<b>MET-</b>
<b>DNA STRAND (any)</b>	
<b>mRNA Strand</b>	
<b>Sentence</b>	
<b>tRNA's</b>	
<b>(Anti-Codons)</b>	
<b>Actual Amino Acids</b>	

<b>DNA Strand (any)</b>	
<b>mRNA Strand</b>	
<b>Sentence</b>	
<b>tRNA (ANTI-CODON)</b>	
<b>Actual Amino Acids</b>	

**Data 2:**

1- Using the same DNA strands used in number 3 above. Copy the DNA strand letters into the table below exactly as you did above **except** that you need to insert a random BASE (A,T,G, or C) into the middle of the DNA strand. IT DOESN'T MATTER WHERE YOU PUT IT!

2- Now go through the rest of the step by making mRNA and finding tRNA etc.

<b>DNA Strand</b>	
<b>mRNA Strand</b>	
<b>Sentence</b>	
<b>tRNA (ANTI-CODON)</b>	
<b>Actual Amino Acids</b>	

3- Explain how and why the new sentence is different.

4- What is it called when letters get either inserted or deleted from DNA?

**Analysis:**

5. In this activity you are working with words and sentences. The words and sentences represent other things in this process. Explain what the following represent in protein synthesis:

Words:

Sentences:

6. In this activity you made sentences that were coherent when you spoke them. Explain why having certain words in the order you had them was important to the function of the sentence.

7. Explain why it is wrong to say that “after the DNA is turned into mRNA it is then turned into tRNA”.

8. Name what special group of proteins make all of the reactions happen in this protein process. (They build and break things down and start with E)

9. Describe the role of:

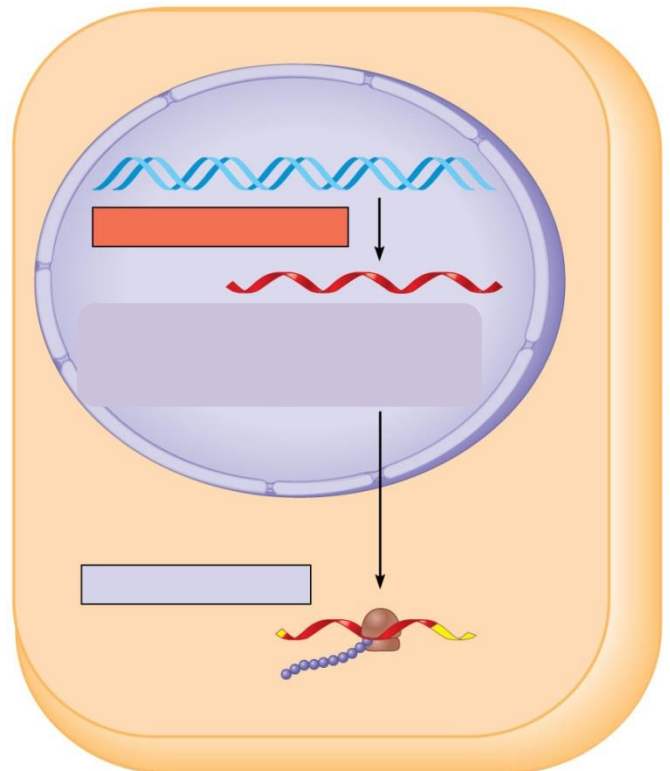
DNA

mRNA

rRNA (Otherwise known as a Ribosome)

tRNA

10. So Explain this picture of the entire process



**THIS CHART IS FOR THE mRNA FOR MAKING SENTENCES. USE THE mRNA TO FIND THE WORDS.**

		SECOND LETTER OF mRNA					
		U	C	A	G		
FIRST LETTER OF mRNA	U	On	All	My	Lunch	U	
		FBI	All	My	Nose	C	
		Will	That	<b>Stop</b>	<b>Stop</b>	A	
		Will	Underestimated	<b>Stop</b>	His	G	
	C	Tattoos	Sees	Born	and	U	
		Tattoos	Sees	Born	Camera	C	
		Power	In	BUTTS	Camera	A	
		World	In	Death	Groups	G	
	A	Stole	is	Grandma	Your	U	
		of	to	Grandma	Friends	C	
		of	Hidden	People	Punch	A	
		<b>The (START)</b>	Hidden	People	Stupid	G	
	G	Corner	a	are	Grandpas	U	
		Corner	a	are	Grandpas	C	
		Tiny	Free	but	Grandpas	A	
		Get	Free	but	Large	G	

**THIRD LETTER OF mRNA**

## Universal Genetic Code Chart

Messenger RNA Codons and Amino Acids for Which They Code

		Second base				
		U	C	A	G	
First base	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G
	C	CUU } LEU CUC } CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } ARG CGC } CGA } CGG }	U C A G
	A	AUU } ILE AUC } AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G
	G	GUU } VAL GUC } GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G

1. TACGATTATTCCTTTGGCCCCGCCTGAAGCACT

2. TACGAGAAATTAGCACCGGTTCTATGTATT

3. TACAAGAATCGTTCATGTTTTATC

4. TACTGTGCTGGCTACCAAGGAAGAATT

5. TACTTCAGTTAAATGACACACCGATCTGGCTACACGACT

