

Name:

Date:

Period:

**Biology: Transcription and Translation Decoding a Message**

Practice the rules for transcription and translation by decoding the two secret messages below!

**Procedure:**

1. Copy the DNA message below onto a sheet of binder paper.
2. On the line below, transcribe the DNA message into an mRNA codon.
3. Below this line, write the tRNA anti-codon for each mRNA codon.
4. Below this, translate the **mRNA codons** into the appropriate amino acid.
5. Next, use the one letter code for the amino acids to decode the messages.
6. Last, answer the questions that follow the activity. Attach all work.

*Example:*

DNA	CGA
mRNA	GCU
tRNA	CGA
A.A.	alanine
Letter	A

**DNA Secret Code 1:**

Where would one find genes retired from the human genetic pool?

TAA TTA CGC TTG GTC GAT GGT AAA GTT AAT TTT TCG CCC CTT TTG  
 GTC TAC CTT

**DNA Secret Code 2:**

How do you tell the difference between a male and a female chromosome?

TGA CGG TTT CTT GGG GTT ACC TTA TGA GTG CTT TAG GCA CCG CTC  
 TTA CTT TCG

**Questions:**

1. What is the process called when DNA is copied to RNA? Where in the cell does this take place?
2. What is the process called when the RNA message is converted into an amino acid sequence? Where does this occur? Why is this step necessary?
3. What would be the result if there was a mutation in the DNA code where the first base in each line was lost?
4. Look at the chart of codons and amino acids. What would happen if there was a change in the third base pair of the codons for Ser, Pro, Thr, and Ala?

		Second Base								
		U	C	A	G	U	C	A	G	
U	U	UUU phe	UCU ser	UAU tyr	UGU cys	U				
	U	UUC phe	UCC ser	UAC tyr	UGC cys	C				
	U	UUA leu	UCA ser	UAA STOP	UGA STOP	A				
	U	UUG leu	UCG ser	UAG STOP	UGG trp	G				
C	C	CUU leu	CCU pro	CAU his	CGU arg	U				
	C	CUC leu	CCC pro	CAC his	CGC arg	C				
	C	CUA leu	CCA pro	CAA gln	CGA arg	A				
	C	CUG leu	CCG pro	CAG gln	CGG arg	G				
A	A	AUU ile	ACU thr	AAU asn	AGU ser	U				
	A	AUC ile	ACC thr	AAC asn	AGC ser	C				
	A	AUA ile	ACA thr	AAA lys	AGA arg	A				
	A	AUG met	ACG thr	AAG lys	AGG arg	G				
G	G	GUU val	GCU ala	GAU asp	GGU gly	U				
	G	GUC val	GCC ala	GAC asp	GGC gly	C				
	G	GUA val	GCA ala	GAA glu	GGA gly	A				
	G	GUG val	GCG ala	GAG glu	GGG gly	G				

Ala=	alanine=	A
Arg=	arginine =	R
Asn=	asparagines =	N
Asp=	aspartic acid=	B
Cys=	cysteine=	C
Gln=	glutamine=	O
Glu=	glutamic acid=	E
Gly=	glycine =	G
His=	histidine=	H
Ile=	isoleucine=	I
Leu=	leucine=	L
Lys=	Lysine=	K
Met=	methionine=	M
Phe=	phenylalanine=	F
Pro=	proline=	D
Ser=	serine=	S
Thr=	threonine=	T
Trp=	tryptophan=	W
Tyr=	tyrosine =	Y
Val=	valine=	V

