

GENETICS II

ACTIVITY #2

TRANSCRIPTION

This represents one half of a DNA molecule. It serves as a template to guide the synthesis of a messenger RNA molecule. Show the correct order of nitrogen bases in the new messenger RNA.

DNA STRAND RNA STRAND

G	_____
C	_____
A	_____
C	_____
T	_____
A	_____
G	_____
C	_____
G	_____
T	_____
T	_____
G	_____
C	_____
T	_____
G	_____
G	_____
A	_____
A	_____
T	_____

**DNA STRAND
(CONTINUED)**

**RNA STRAND
(CONTINUED)**

C	_____
G	_____
G	_____
G	_____
C	_____
T	_____
A	_____
C	_____
T	_____
C	_____
G	_____
A	_____
T	_____
G	_____
G	_____
C	_____
T	_____
A	_____
T	_____

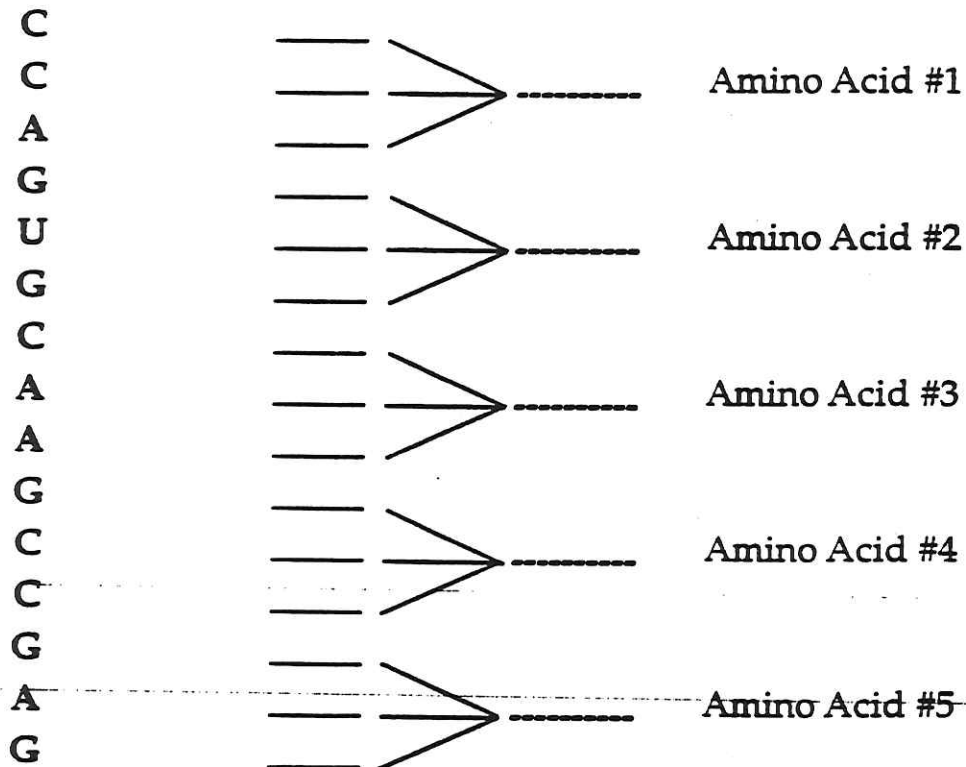
ACTIVITY #3

TRANSLATION

This represents a messenger RNA molecule. Transfer RNA molecules have the job of delivering the correct amino acid to the messenger RNA based on the codon present. Fill in the boxes to show the correct order of nitrogen bases found in the anti-codon of the transfer RNA molecule.

mRNA

tRNA



ACTIVITY #4

TRANSLATION

The following represents a sequence of nitrogen bases in a DNA molecule. Using the genetic code for the amino acids given, determine the correct sequence of amino acids that would result after transcription and translation.

CODON	AMINO ACID	CODON	AMINO ACID
TTT	Lysine	AGA	Serine
ATA	Tyrosine	ACA	Cysteine
TCT	Arginine	GTA	Glutamine
GGA	Proline	TAC	Methionine
CCA	Glycine	AAT	Leucine

DNA

AMINO ACID SEQUENCE

G
G
A
A
G
A
T
T
T
T
A
C
C
C
A
A
A
T

AA #1 _____

AA #2 _____

AA #3 _____

AA #4 _____

AA #5 _____

AA #6 _____

Name .

Using the Genetic Code on page S12 of your packet, write which amino acid each 3 base sequence codes for.

tRNA	mRNA	amino acid Symbol	amino acid name
1. UCG -			
2. AAA -			
3. UAG -			
4. GUU -			
5. CCA -			
6. GCU -			
7. UGA -			
8. CUG -			
9. GAC -			
10. AGU -			

Name: _____

Fill in the following chart with the correct sequence

DNA	TAC	AAT	TCG	CGT	ACG	GGC	TTT	ACC	ATC
mRNA	AUG								
tRNA	UAC								
amino acid	met								
amino acid name	methionine								

THE GENETIC CODE

First Position	Second Position				Third Position
	U	C	A	G	
U	phe phe leu leu	ser ser ser ser	tyr tyr end end	cys cys end trp	U C A G
C	leu leu leu leu	pro pro pro pro	his his gln gln	arg arg arg arg	U C A G
A	ile ile ile met	thr thr thr thr	asn asn lys lys	ser ser arg arg	U C A G
G	val val val val	ala ala ala ala	asp asp glu glu	gly gly gly gly	U C A G

Refer to this chart to translate the mRNA in Dry Labs #1, 2 and 3 into proteins. Read the chart by determining the letters in a three base sequence (for example, C U G). In this sequence, C is the first position, U is the second position, and G is the third position. Now, find the place on the chart where all three positions meet, and read the corresponding abbreviations to determine the which amino acid this sequence codes for. (In this example, C U G codes for leu, or leucine.) In the chart above, **end** indicates a termination codon.

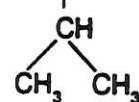
20 AMINO ACIDS COMMONLY FOUND IN PROTEINS



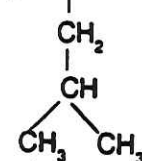
glycine (gly)



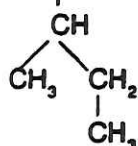
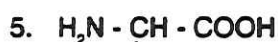
alanine (ala)



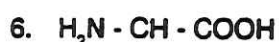
valine (val)



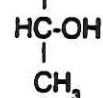
leucine (leu)



isoleucine (ile)



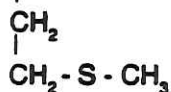
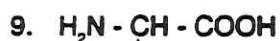
serine (ser)



threonine (thr)



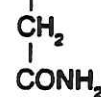
cysteine (cys)



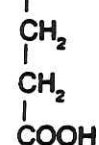
methionine (met)



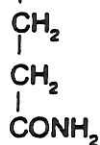
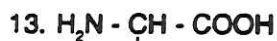
aspartic acid (asp)



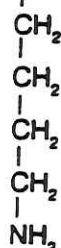
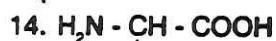
asparagine (asn)



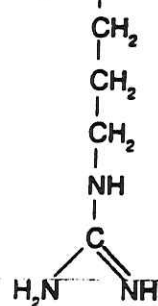
glutamic acid (glu)



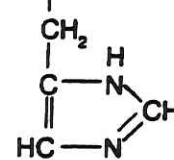
glutamine (gln)



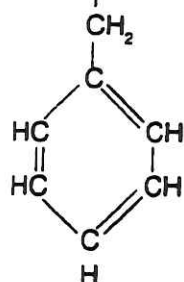
lysine (lys)



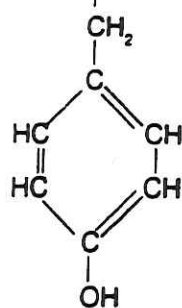
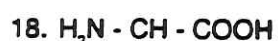
arginine (arg)



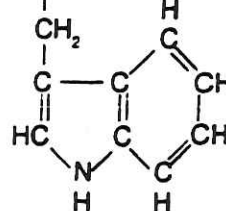
histidine (his)



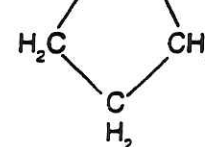
phenylalanine (phe)



tyrosine (tyr)



tryptophan (trp)



proline (pro)