

DNA Transcription & Translation

Lab supplies:

Scissors

Tape

DNA REPLICATION

1. Given the following anti-sense strand -- what is the corresponding sense strand?

TAC GGT CGA GAA AGG TTT AGG ACG GAG GCC GGG CAG
GGG AGT TGG TAG

PROTEIN SYNTHESIS

1. **Transcription:** given the following DNA template (anti-sense strand), fill in the RNA nucleotides to create an mRNA transcript. Use the templates provided

← NOTE:
"of sense
DNA,"
is given

of sense
DNA

TAC GGT CGA GAA AGG TTT AGG ACG GAG GCC GGG CAG
GGG AGT TGG TAG

2. Fill in the nucleotides on the provided mRNA "strand", cut it out and paste them together to create your mRNA template
3. **Translation:** Using the provided codon table, create the correct amino acids using the tRNAs provided.
4. Using the mRNA template, the ribosome template and the tRNAs you made, go through the process of translation step by step. Use tape to represent peptide bonds

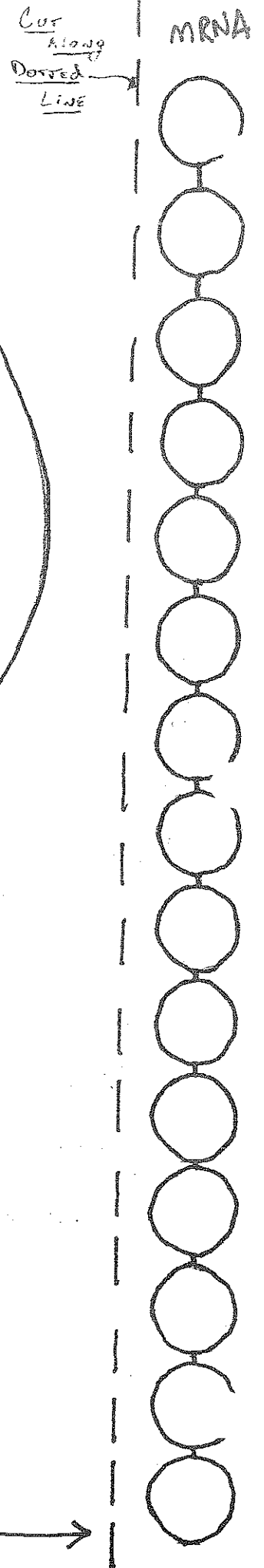
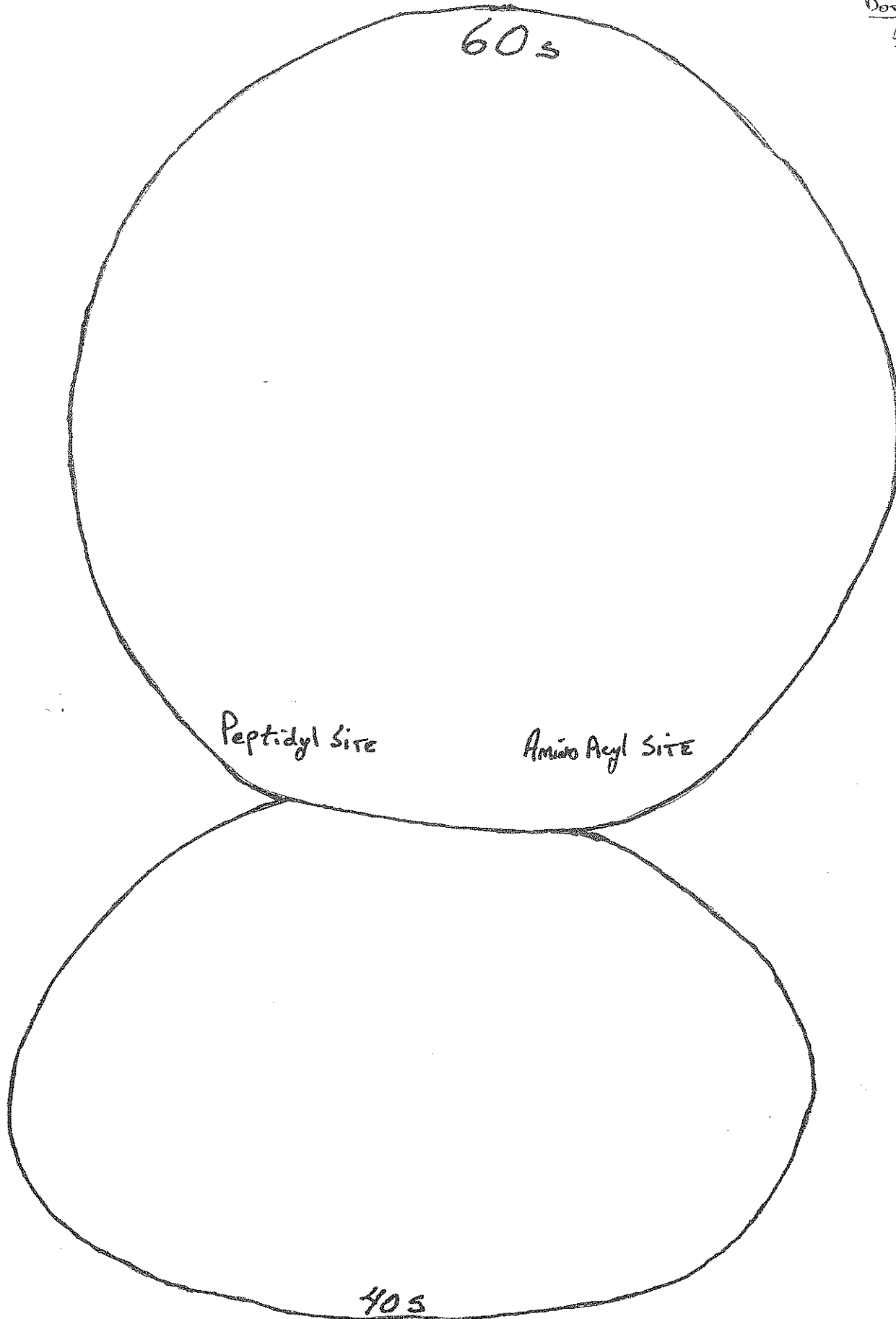
THE STANDARD GENETIC CODE

UUU	Phe	UCU	Ser	UAU	Tyr	UGU	Cys
UUC	Phe	UCC	Ser	UAC	Tyr	UGC	Cys
UUA	Leu	UCA	Ser	UAA	Stop*	UGA	Stop*
UUG	Leu	UCG	Ser	UAG	Stop*	UGG	Trp
CUU	Leu	CCU	Pro	CAU	His	CGU	Arg
CUC	Leu	CCC	Pro	CAC	His	CGC	Arg
CUA	Leu	CCA	Pro	CAA	Gln	CGA	Arg
CUG	Leu	CCG	Pro	CAG	Gln	CGG	Arg
AUU	Ile	ACU	Thr	AAU	Asn	AGU	Ser
AUC	Ile	ACC	Thr	AAC	Asn	AGC	Ser
AUA	Ile	ACA	Thr	AAA	Lys	AGA	Arg
AUG	Met	ACG	Thr	AAG	Lys	AGG	Arg
GUU	Val	GCU	Ala	GAU	Asp	GGU	Gly
GUC	Val	GCC	Ala	GAC	Asp	GGC	Gly
GUA	Val	GCA	Ala	GAA	Glu	GGA	Gly
GUG	Val	GCG	Ala	GAG	Glu	GGG	Gly

AUG is part of the initiation signal, as well as being the codon for internal methionine.

SYMBOLS FOR AMINO ACIDS

A	Alanine
B	Asparagine or aspartic acid
C	Cysteine
D	Aspartic acid
E	Glutamic acid
F	Phenylalanine
G	Glycine
H	Histidine
I	Isoleucine
K	Lysine
L	Leucine
M	Methionine
N	Asparagine
P	Proline
Q	Glutamine
R	Arginine
S	Serine
T	Threonine
V	Valine
W	Tryptophan
Y	Tyrosine
Z	Glutamine or glutamic acid



Cut
Along
Dotted
LINE

MRNA

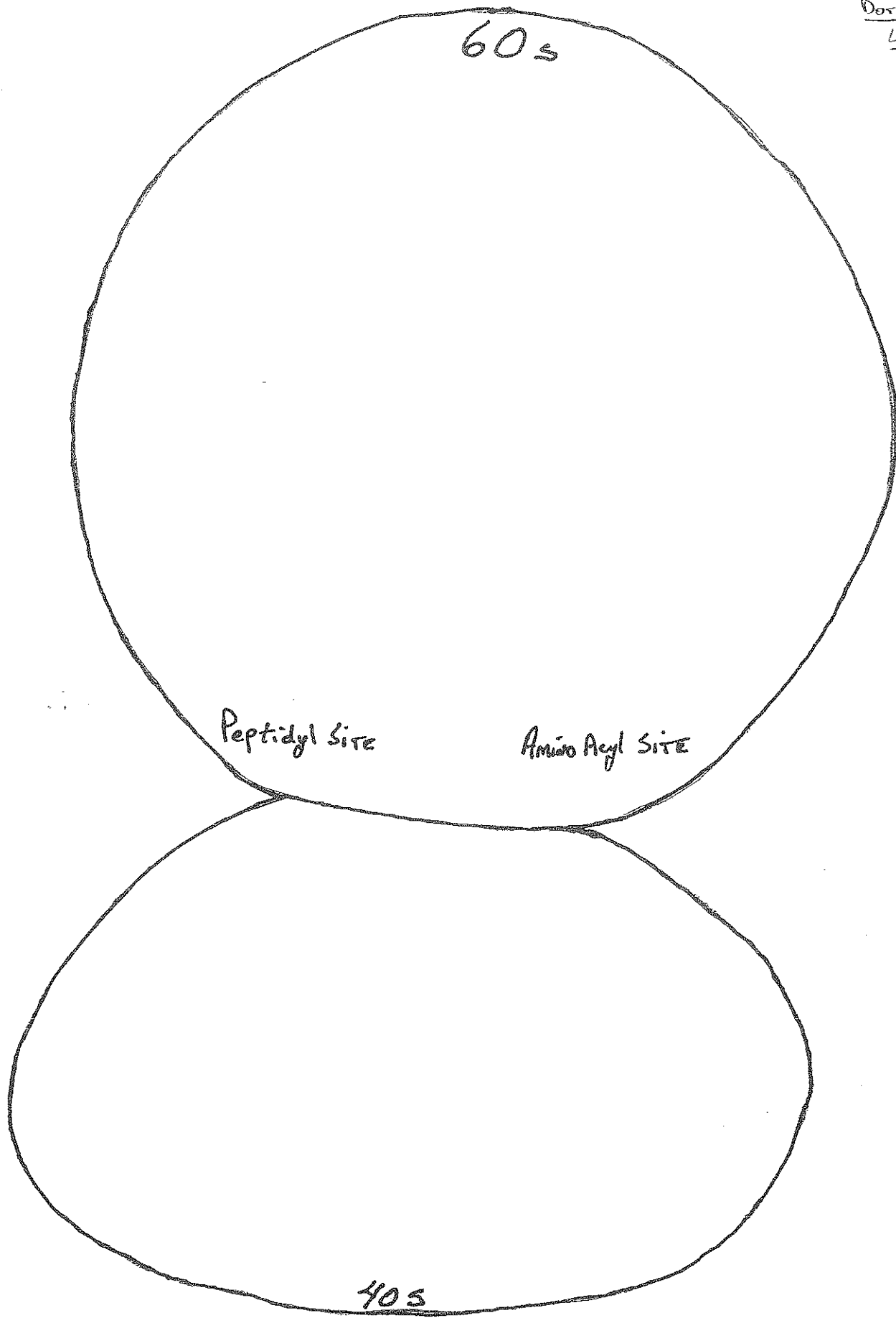
60s

Peptidyl Site

Amino Acyl SITE

40s

Fill in your
MRNA in the
"bubbles" & tape together



Cut
along
Dotted
Line



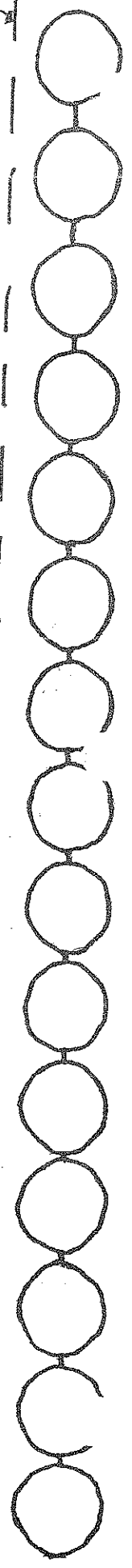
Cur
Along
Dotted
Line

60s

Peptidyl Site

Amino Acyl Site

40s



Cut
Along
Dotted
Line

60s

Peptidyl Site

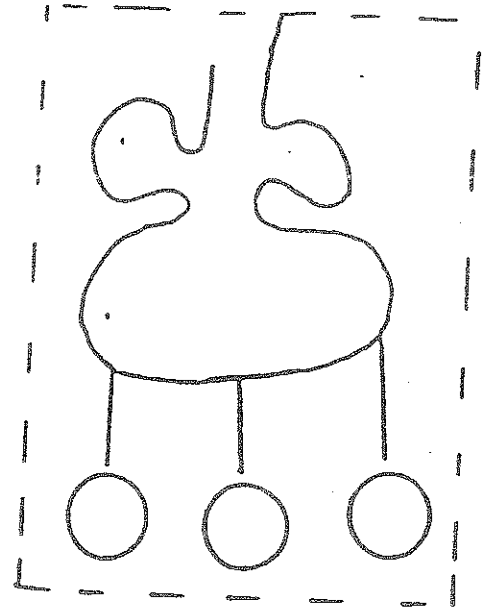
Amino Acyl Site

40s

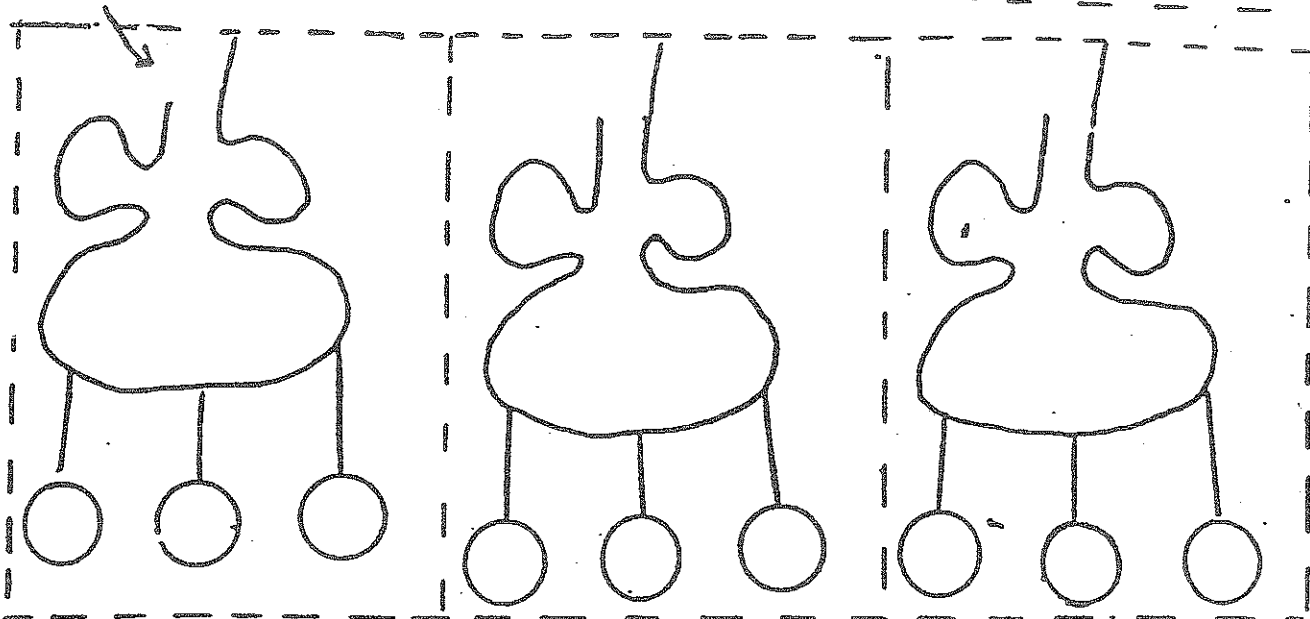


tRNA molecules: Fill in the proper ANTICODON sequence in the circles.

attach a.a. here:

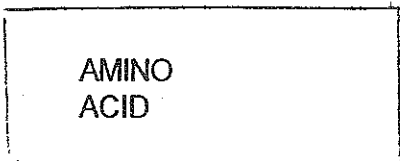
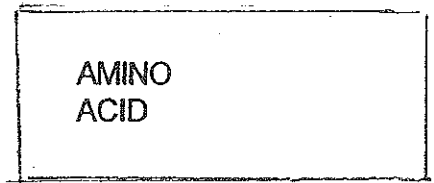
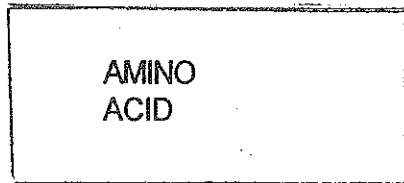
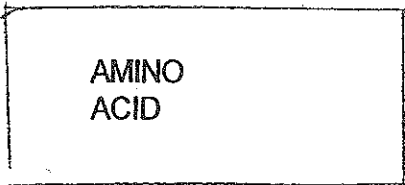


attach a.a. here:



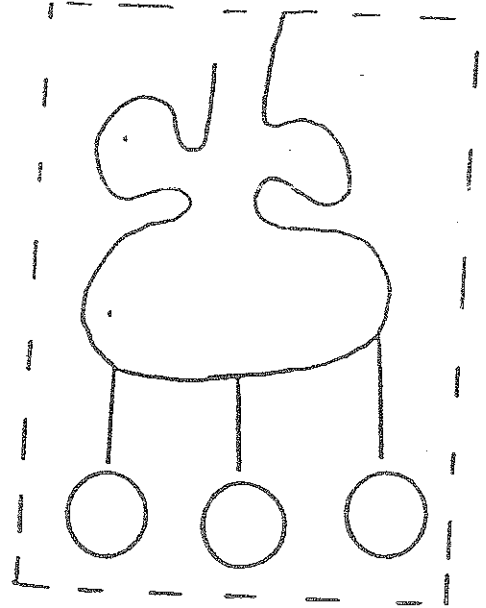
Amino Acids

Use tape to represent a peptide bond between the amino acids.
Attach the right side of the amino acid to the left side of the tRNA.

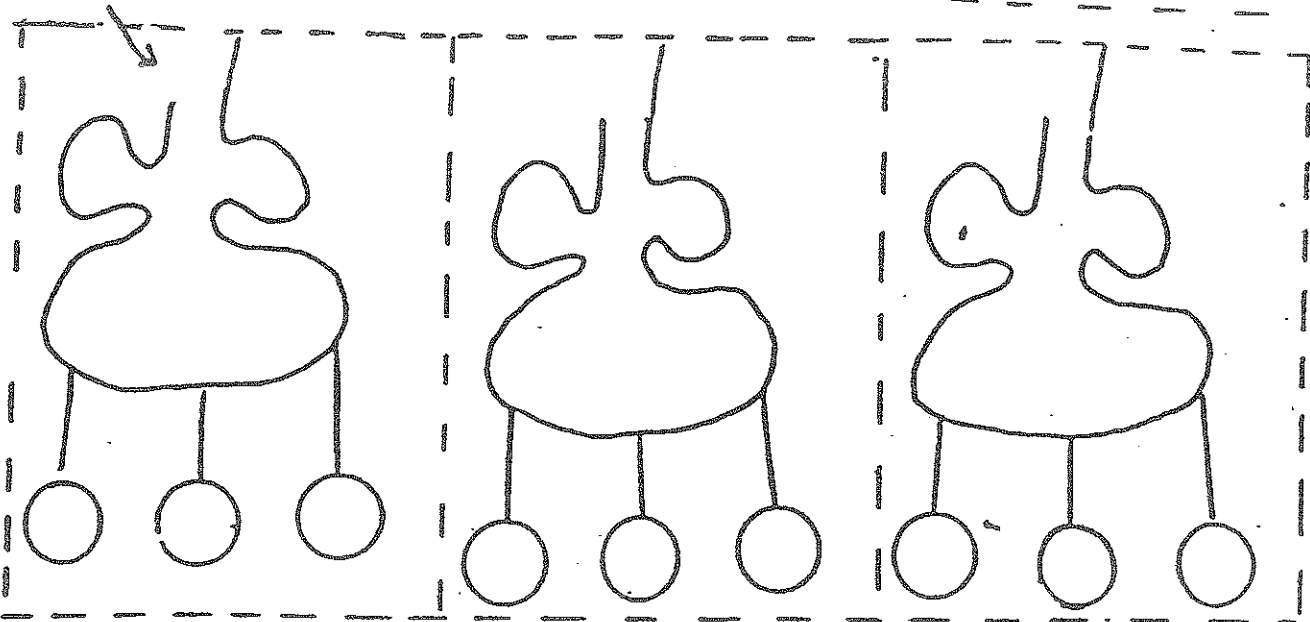


tRNA molecules: Fill in the proper ANTICODON sequence in the circles.

attach a.a. here:

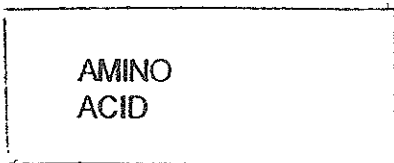
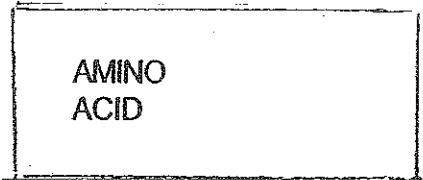
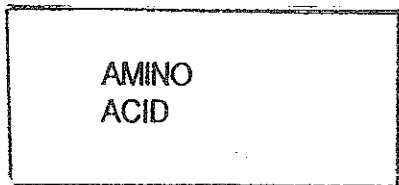
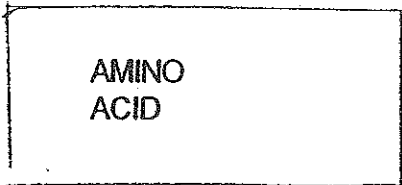


attach a.a. here:



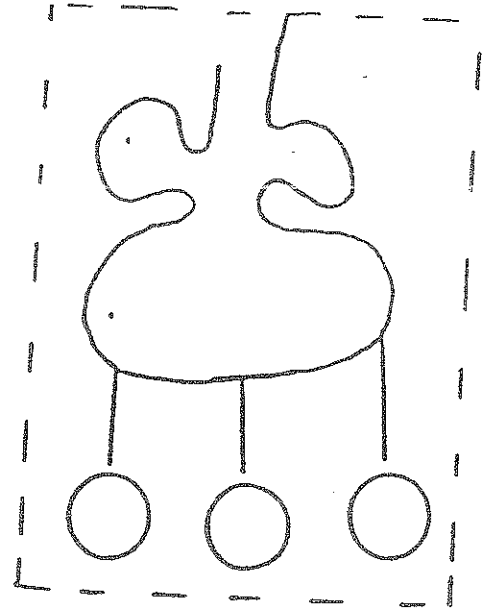
Amino Acids

Use tape to represent a peptide bond between the amino acids.
Attach the right side of the amino acid to the left side of the tRNA.

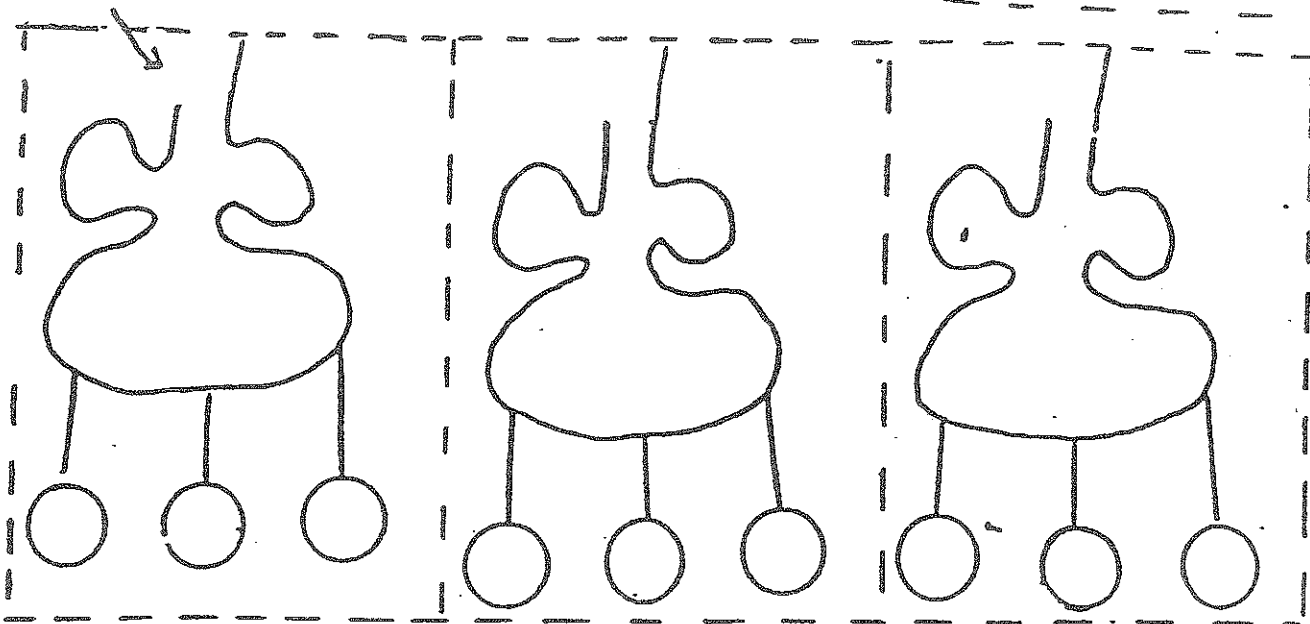


tRNA molecules: Fill in the proper ANTICODON sequence in the circles.

attach a.a. here:

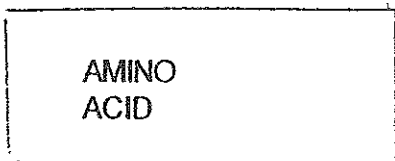
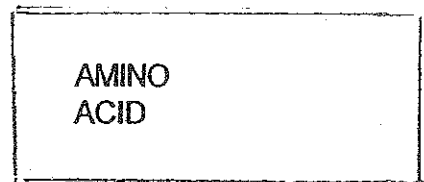
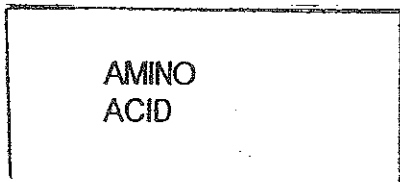
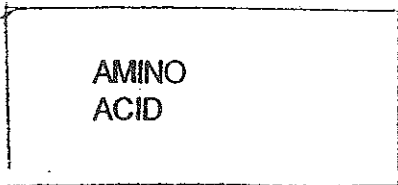


attach a.a. here:



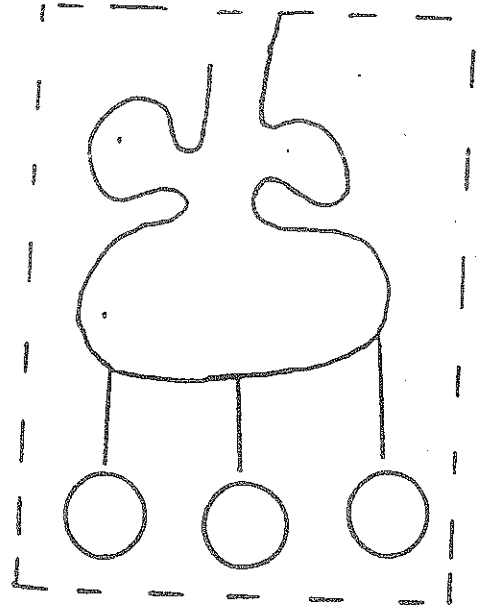
Amino Acids

Use tape to represent a peptide bond between the amino acids.
Attach the right side of the amino acid to the left side of the tRNA.

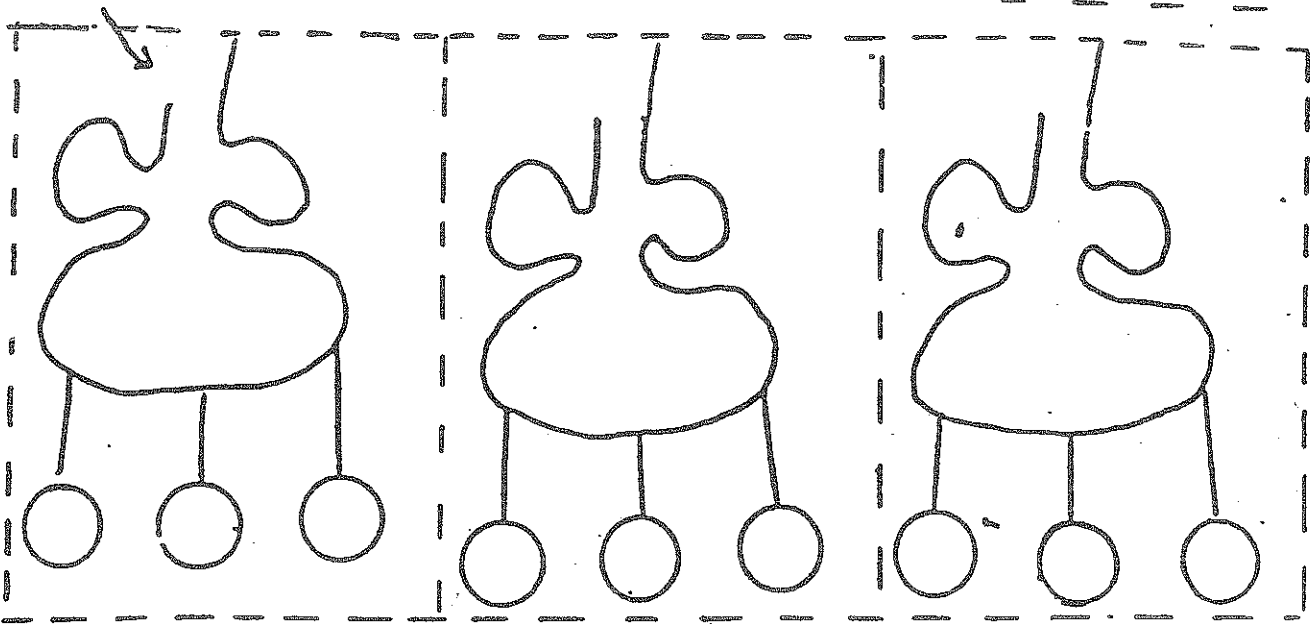


tRNA molecules: Fill in the proper ANTICODON sequence in the circles.

attach a.a. here:



attach a.a. here:



Amino Acids

Use tape to represent a peptide bond between the amino acids.
Attach the right side of the amino acid to the left side of the tRNA.

