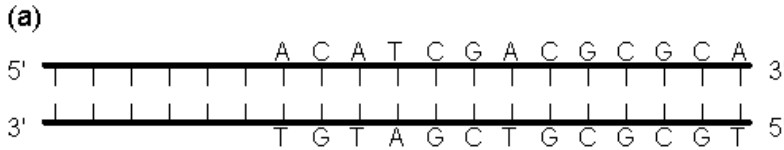
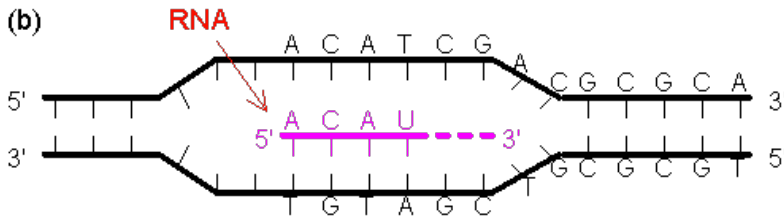


# PROTEIN SYNTHESIS

Name: \_\_\_\_\_



As you can see in the diagram to the left, to begin the process of protein synthesis, the DNA must first be opened and an RNA molecule must be made.



**RNA** is different from DNA in a couple ways. It's made of the sugar ribose rather than deoxyribose, it uses uracil instead of thymine, and most importantly, it *can* leave the nucleus.

Messenger RNA (mRNA) is made by matching complimentary nucleotides to their partners. Practice determining the mRNA sequence from the original DNA sequence.

*Hint: When you would have put a T, put a U now.*

DNA	A	T	G	T	T	C	A	G	A
mRNA									

DNA	T	A	G	G	A	T	C	C	G
mRNA									

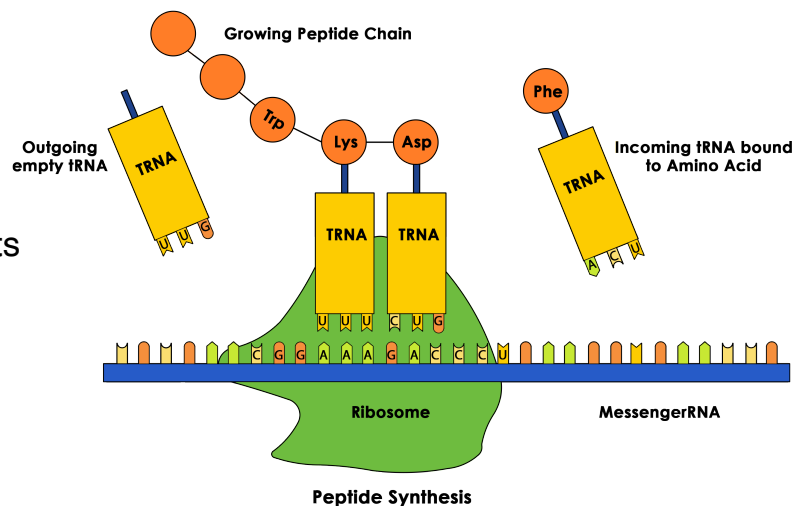
DNA	G	C	A	T	A	G	T	T	A
mRNA									

DNA	G	C	C	C	T	A	A	C	G
mRNA									

After it is created, the mRNA will leave the nucleus and travel to a ribosome.

Inside the ribosome the mRNA is matched in 3 letter segments with complementary Transfer RNA (tRNA). These three letter segments are called **codons**.

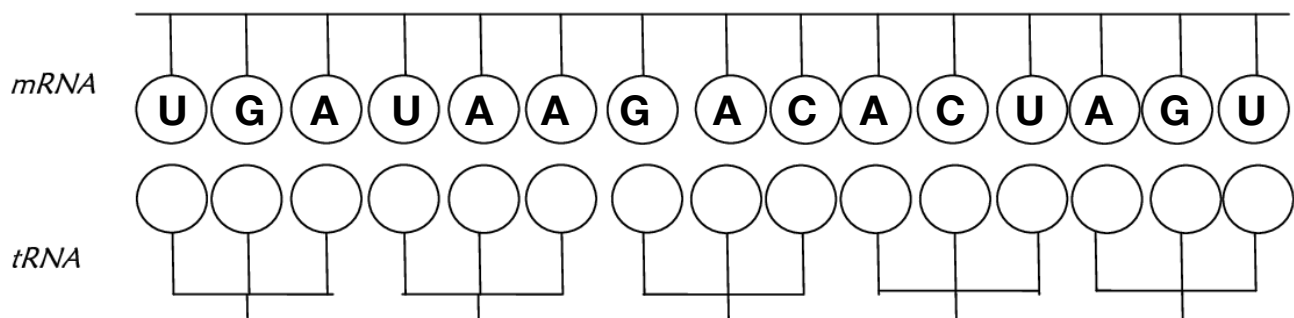
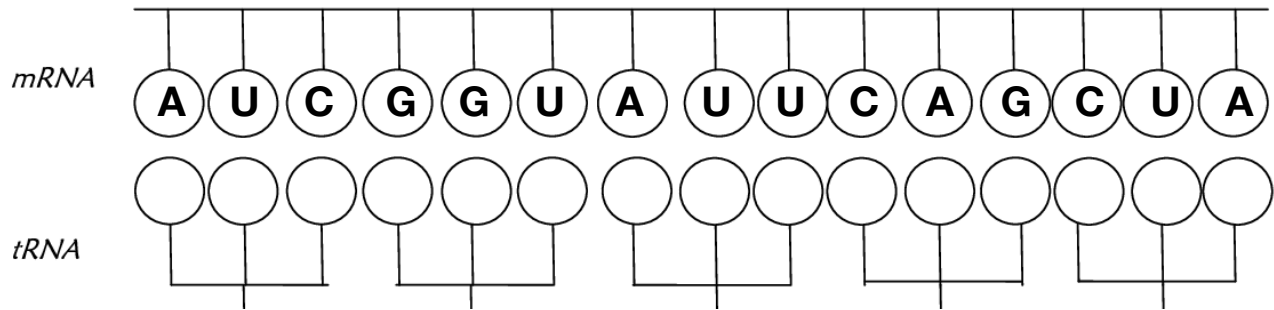
Each codon codes for a specific amino acid, which will be bonded to the tRNA and added to the peptide chain as it is matched to the complementary mRNA codon.



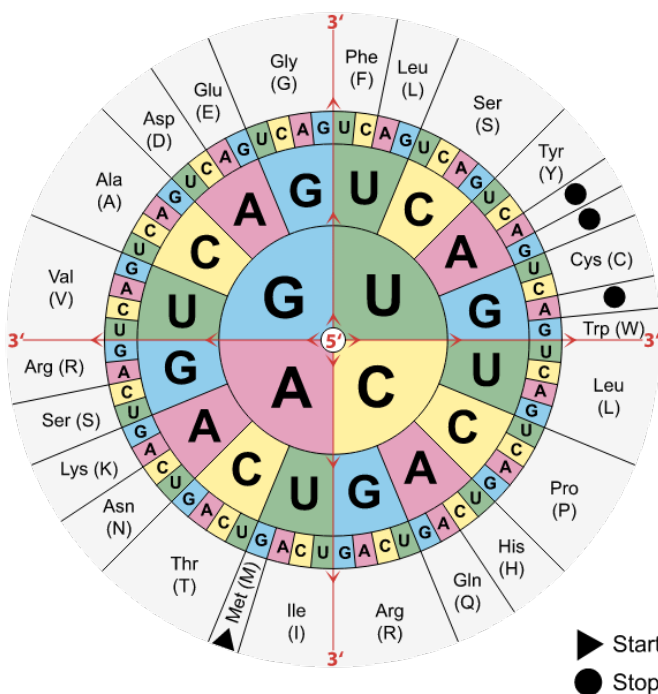
# PROTEIN SYNTHESIS

Name: \_\_\_\_\_

Practice matching mRNA with the complementary tRNA strand. Again, remember that any where you would have had a T, you will again have a U.



In order to determine which amino acid will be added to the growing peptide chain, we look at the codon, or three letter code, in the mRNA, not the tRNA. Consider the tRNA as just the vehicle which transports the amino acid to its place. The mRNA is the keeper of the actual message. Use the table by matching the codon starting from the center and following the letters towards the outside.



Practice determining which amino acid will be added based on each codon.

mRNA Codon	Amino Acid
AUG	
GUA	
UAC	
CAU	
UUA	
GGC	
UAG	
UGA	
CCC	
CAG	
AAC	

# PROTEIN SYNTHESIS

Name: \_\_\_\_\_

Finally, you should be able to transcribe and translate a molecule of DNA from start to finish. Helpful hints to remember:

- Only DNA has thymine (T), from there, all T's should be replaced with U's (uracil)
- The amino acid is determined using the codon in the mRNA, not the tRNA. Make sure you're looking at the right row!
- You can't determine amino acids without the help of a decoder like the one on the previous page. Flip back!

