

AUG is the start codon

mRNA Codon Chart

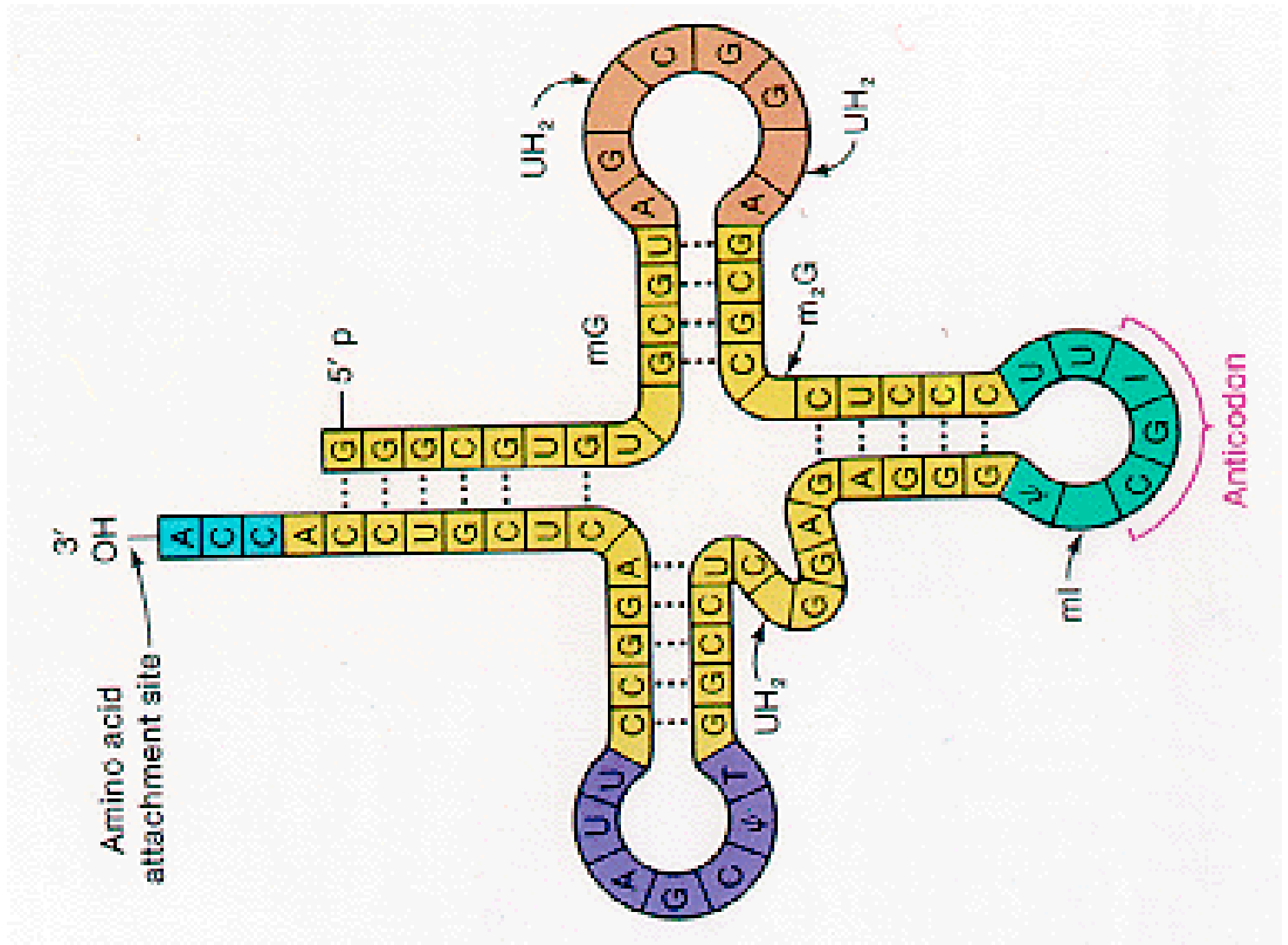
Read from 5' to 3'

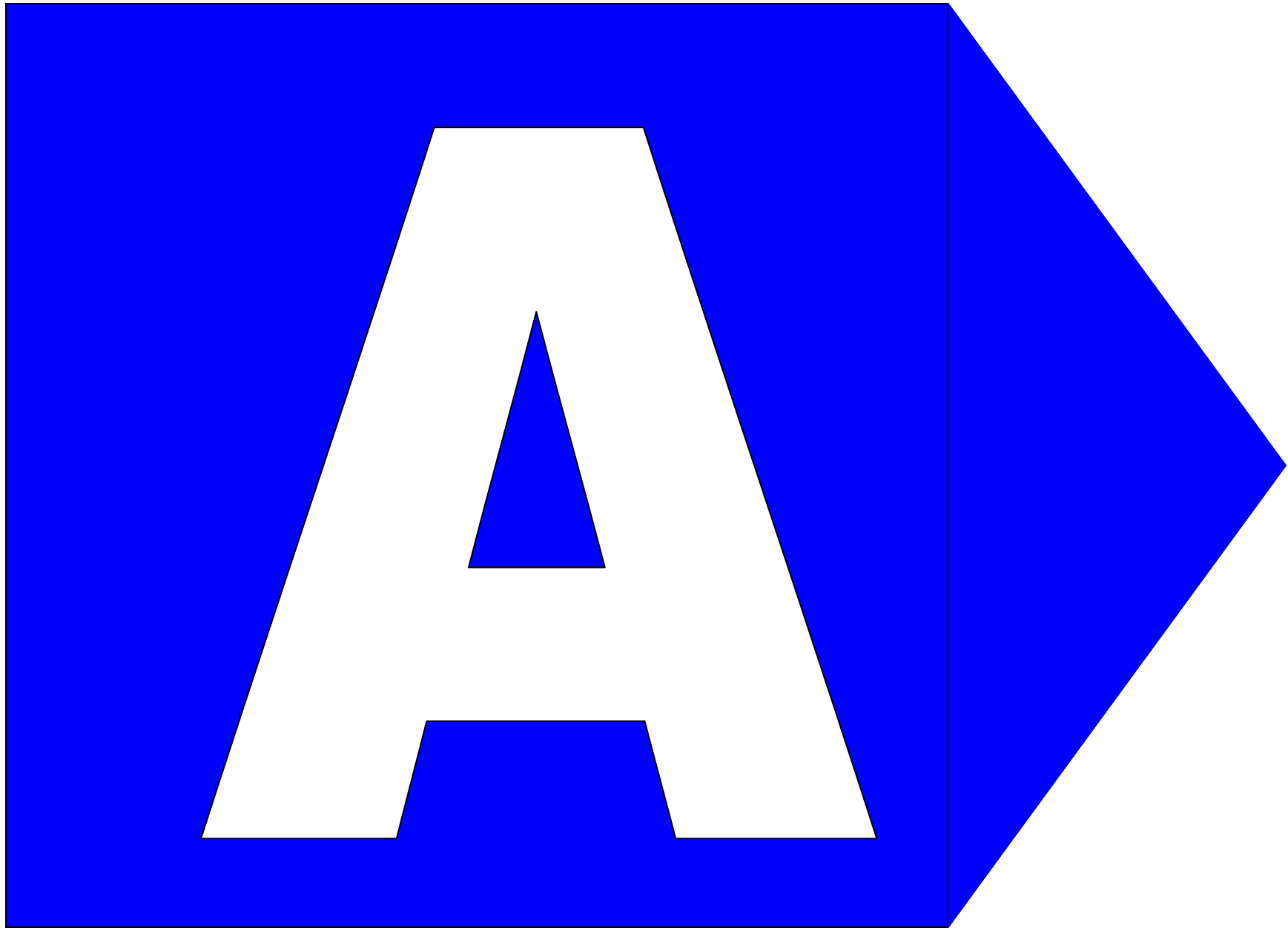
		Second Position									
		U		C		A		G			
		code	Amno Acid	code	Amno Acid	code	Amno Acid	code	Amno Acid		
First Position	U	UUU	phe	UCU	ser	UAU	tyr	UGU	cys	U	Third Position
		UUC		UCC		UAC		UGC		C	
		UUA	leu	UCA		UAA	STOP	UGA	STOP	A	
		UUG		UCG		UAG	STOP	UGG	trp	G	
	C	CUU	leu	CCU	pro	CAU	his	CGU	arg	U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

tRNA anticodon chart

Read from 3' - 5'

		2nd Position									
		U		C		A		G			
		anticodon	Amino Acid	anticodon	Amino Acid	anticodon	Amino Acid	anticodon	Amino Acid		
1st Position	U	UUU	lys	UCU	arg	UAU	iso	UGU	thr	U	
		UUC	lys	UCC	arg	UAC	Start/met	UGC	thr	C	
		UUA	asn	UCA	ser	UAA	iso	UGA	thr	A	
		UUG	asn	UCG	ser	UAG	iso	UGG	thr	G	
	C	CUU	glu	CCU	gly	CAU	val	CGU	ala	U	
		CUC	glu	CCC	gly	CAC	val	CGC	ala	C	
		CUA	asp	CCA	gly	CAA	val	CGA	ala	A	
		CUG	asp	CCG	gly	CAG	val	CGG	ala	G	
	A	AUU	stop	ACU	stop	AAU	leu	AGU	ser	U	
		AUC	stop	ACC	trp	AAC	leu	AGC	ser	C	
		AUA	tyr	ACA	cys	AAA	phe	AGA	ser	A	
		AUG	tyr	ACG	cys	AAG	phe	AGG	ser	G	
	G	GUU	glu	GCU	arg	GAU	leu	GGU	pro	U	
		GUC	glu	GCC	arg	GAC	leu	GGC	pro	C	
		GUA	his	GCA	arg	GAA	leu	GGA	pro	A	
		GUG	his	GCG	arg	GAG	leu	GGG	pro	G	

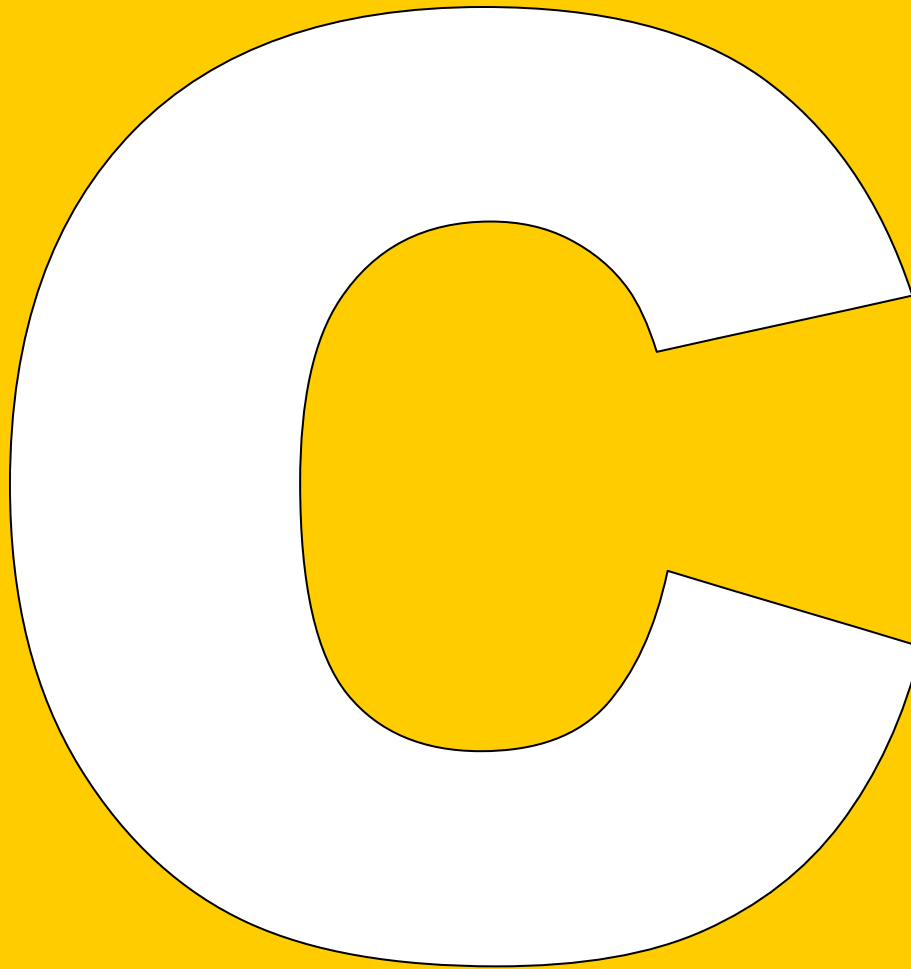




DNA/RNA Nucleotide Card



DNA Nucleotide Card



DNA/RNA Nucleotide Card



DNA/RNA NucleotideCard

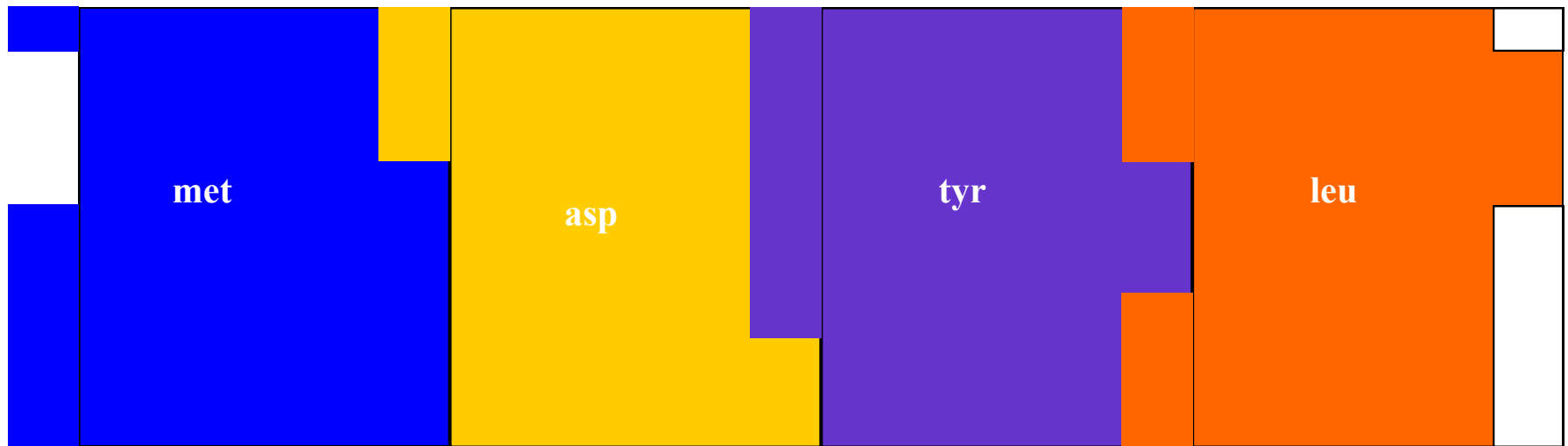


RNA Nucleotide Card

3-D Protein Puzzle

The protein puzzle can be made from foam board, foam craft sheets, card board, Styrofoam or even Legos®.

- Foam craft sheets have the advantage of being large and can be cut with scissors. It may not be stiff enough, however, two or three sheets can be glued together and then glued to cardstock. Cut the tabs and interlocks before gluing together.
- Legos® are rigid and would work well but this application requires a lot of Legos®. Save on the number of blocks by making only the outer edge. Glue or tape the blocks to a sheet of cardstock.



Tabs should be equal to the width of the board. It will form the four sides of the cube.

TRUE-FALSE CARDS

Directions:

Divide the cards into two groups, true statements about protein synthesis and false statements.

In DNA, adenine binds with thymine and cytosine binds with guanine.

In RNA, adenine binds with thymine and cytosine binds with uracil.

When the mRNA strand leaves the nucleus, it moves into the cytoplasm and binds to a ribosome, the site of protein synthesis.

The building blocks of nucleic acids are amino acids.

UAA does not have an anticodon on a tRNA

Transcription takes place in the nucleus while translation takes place in the cytoplasm.

The ribosome has two binding sites, one for the mRNA and one for the tRNA.

The process of decoding the mRNA strand into a protein is called transcription.

Proteins synthesized in the cell are used as enzymes within the cell.

A gene is a sequence of DNA nucleotides that codes for a type of protein or RNA.

The ribosome attaches to a start codon on mRNA to begin reading the code.

The nitrogen bases on the tRNA is called the anticodon.

There are 20 amino acid and therefore 20 codons needed for transcription and translation.

mRNA is formed from RNA polymerase in a process called translation.

A codon is made up of 4 Nucleotides read in a specific order.

The polypeptide begins folding in the ER.

The ribosome forms a peptide bond between two amino acids on its active sites.

TRUE-FALSE CARDS

Teacher Copy

Red print represents the false answers.

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mRNA is formed from RNA polymerase in a process called translation.

A codon is made up of 4 Nucleotides read in a specific order.

The polypeptide begins

The ribosome forms a peptide bond between two amino acids bound to tRNA on its active sites.