Name: Date:

Science 10: Protein Synthesis

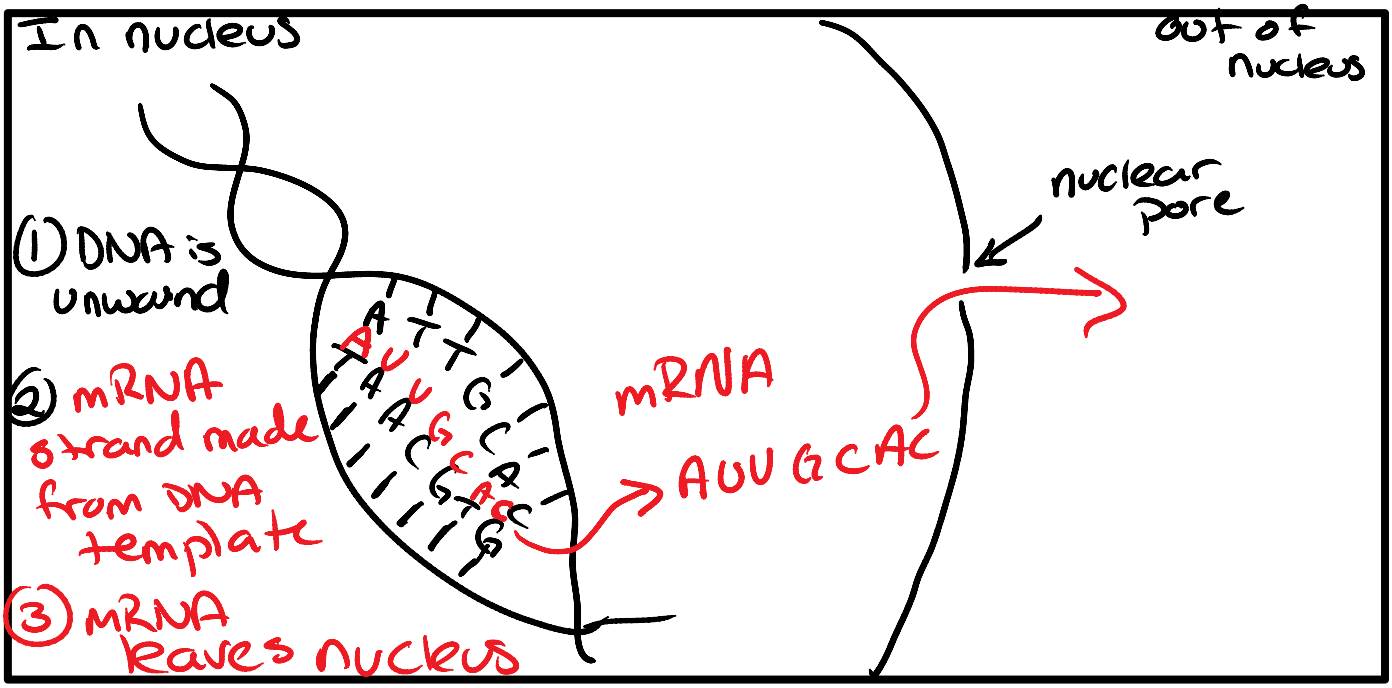
Genes:

- DNA is a sequence of bases
- Groups of 3 bases code for 1 amino acid.
- Amino acids come together to make proteins.

Steps for making a protein:

1) Transcription – In the nucleus a copy of the DNA is made in the form of mRNA
   - mRNA stands for messenger ribonucleic acid
   - mRNA is very similar to DNA, but instead of the sugar being deoxyribose, it is ribose and instead of the base thymine, the base is uracil (U)
   - Once the mRNA is complete, it will leave the nucleus through a nuclear pore

•RNA is a single strand



2) Translation – The protein is made at a ribosome
   - Once out of the nucleus, the mRNA goes to a ribosome.
   - Another type of RNA, transfer RNA (tRNA), looks for the matching bases on the mRNA at the ribosome.
   - The first codon (on mRNA) to get matched is always AUG. The matching anticodon (on tRNA) is UAC.
   - The amino acid that each codon codes for can be found on the chart below. The codon AUG is for the amino acid methionine.
   - tRNA will continue reading codons and matching up anticodons to build the chain of amino acids until the tRNA reads a "Stop" codon. These are UAA, UAG and UGA.

many.

Second base

First base	U	C	A	G	Third base
U	UUU, UUC — Phenylalanine F UUA, UUG — Leucine L	UCU, UCC, UCA, UCG — Serine S	UAU, UAC — Tyrosine Y UAA, UAG — Stop codon	UGU, UGC — Cysteine C UGA — Stop codon UGG — Tryptophan W	U C A G
C	CUU, CUC, CUA, CUG — Leucine L	CCU, CCC, CCA, CCG — Proline P	CAU, CAC — Histidine H CAA, CAG — Glutamine Q	CGU, CGC, CGA, CGG — Arginine R	U C A G
A	AUU, AUC, AUA — Isoleucine I AUG — Methionine start codon M	ACU, ACC, ACA, ACG — Threonine T	AAU, AAC — Asparagine N AAA, AAG — Lysine K	AGU, AGC — Serine S AGA, AGG — Arginine R	U C A G
G	GUU, GUC, GUA, GUG — Valine V	GCU, GCC, GCA, GCG — Alanine A	GAU, GAC — Aspartic acid D GAA, GAG — Glutamic acid E	GGU, GGC, GGA, GGG — Glycine G	U C A G

Translation