<u>**CONCEPT:** GENETIC CODE</u>

●**Genetic Code**: a table that reveals how DNA/RNA encode the sequence of amino acids in a protein.

- □ Relatively universal across all organisms but can have some differences.
- □ Analyzes one ____________ at a time, each which reveals one amino acid.

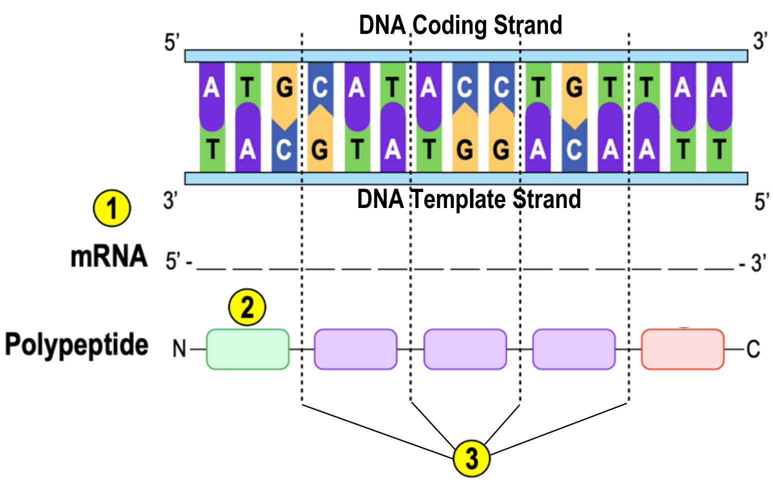
<u>How to Use the Genetic Code</u>

●Using the genetic code is a _____-step process:

1. Use the *coding* DNA sequence to reveal the mRNA sequence (replacing T with U).
2. Identify the ____-nucleotide codon *frames* within the mRNA transcript (including start & stop codons).
3. Identify the *amino acid* that corresponds with each codon until a __________ codon is reached.

●The genetic code shows the ____ letter (left side) ____ letter (top) and ____ letter (right side) of all possible codons.

EXAMPLE: Determine the polypeptide sequence from the following DNA sequence:



_______________ Letter of Codon

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

PRACTICE: The redundancy of the genetic code is a consequence of ______.

a) Having more codons than amino acids.

b) Having four different letters (As, Cs, Gs, and Us) in the codon alphabet.

c) Having fewer codons than there are amino acids.

d) Each codon having a single amino acid.

CONCEPT: GENETIC CODE

PRACTICE: A particular triplet of bases in the template strand of DNA is 5'-AGT-3'. What would be the corresponding codon for the mRNA that is transcribed?

a) 3'-UCA-5'.
c) 5'-TCA-3'.
b) 3'-UGA-5'.
d) 3'-ACU-5'.

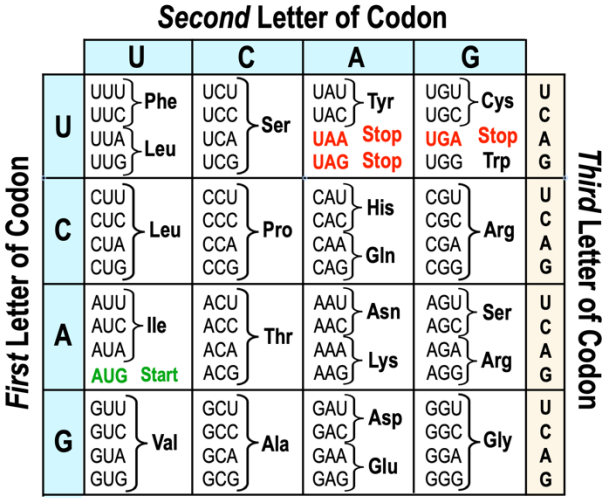
PRACTICE: A particular triplet of bases in the coding sequence of DNA is AAA. The anticodon on the tRNA that binds the mRNA codon is _____.

a) TTT.
c) UUU.
b) UUA.
d) AAA.

Use the codon table on the right to answer the following questions:

PRACTICE: Which of the following sequences of nucleotides are possible in the template strand of DNA that would code for the polypeptide sequence Phe–Leu–Ile–Val?

a) 5'–TTG–CTA–CAG–TAG–3'.
b) 5'–AUG–CTG–CAG–TAT–3'.
c) 3'–AAA–AAT–ATA–ACA–5'.
d) 3'–AAA–GAA–TAA–CAA–5'.



PRACTICE: What amino acid sequence will be generated, based on the following mRNA codon sequence?
5'–AUG–UCU–UCG–UUA–UCC–UUG–3'

a) Met-Arg-Glu-Arg-Glu-Arg.
b) Met-Glu-Arg-Arg-Glu-Leu.
c) Met-Ser-Leu-Ser-Leu-Ser.
d) Met-Ser-Ser-Leu-Ser-Leu.