

Breaking The Code

Worksheet

Directions:

Transcription: for each of the DNA segment below, write the sequence of messenger RNA codons that are synthesized during transcription. Be sure to separate the codons into triplets.

Translation: For each of the mRNA codon sequence you have written, determine the sequence of tRNA anticodons that match.

Polypeptide: Using the Genetic Code chart, write the amino acid sequence coded for by each mRNA. (note: The code is based on mRNA codons, not tRNA anticodons.)

Universal Genetic Code Chart

		Second base					
		U	C	A	G		
First base	U	UUU } PHE UUC } UUA } LEU UUG }	UCU } UCC } SER UCA } UCG }	UAU } TYR UAC } UAA } STOP UAG }	UGU } CYS UGC } UGA } STOP UGG } TRP	U C A G	
	C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } PRO CCA } CCG }	CAU } HIS CAC } CAA } GLN CAG }	CGU } CGC } ARG CGA } CGG }	U C A G	
	A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } THR ACA } ACG }	AAU } ASN AAC } AAA } LYS AAG }	AGU } SER AGC } AGA } ARG AGG }	U C A G	
	G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } ALA GCA } GCG }	GAU } ASP GAC } GAA } GLU GAG }	GGU } GGC } GLY GGA } GGG }	U C A G	

1. Mike just finished eating a delicious school lunch. He must now digest his food but must first make more digestive enzymes. Let's see if you can help Mike make enzymes.

DNA segment #1 (digestive enzyme gene) TAC CGG ATG CCA GAT CAA ATC

Transcription (making mRNA codons)

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Translation (making tRNA anticodons)

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Polypeptide (amino acid chain)

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2. Mike's blood sugar increase as he digests his food. He needs to release insulin so he can lower the blood sugar and maintain homeostasis. Mike's pancreas cells are busy producing the protein insulin. Let's see if you can help Mike make insulin.

DNA segment #2 (insulin gene) TAC GGG GGC GTA ACC ACA ACT

Transcription (making mRNA codons)

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Translation (making tRNA anticodons)

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Polypeptide (amino acid chain)

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