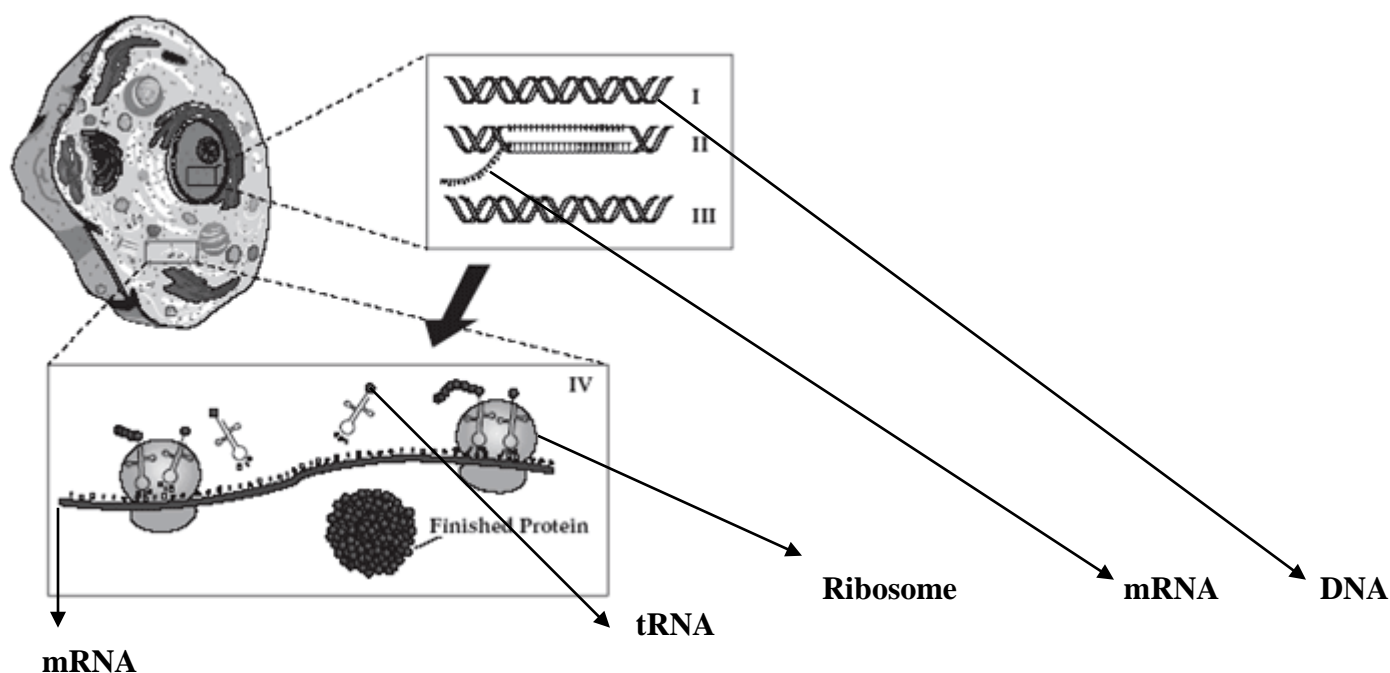


PROTEIN SYNTHESIS WORKSHEET

PART A. Read the following:

Protein synthesis is the process used by the body to make proteins. The first step of protein synthesis is called Transcription. It occurs in the nucleus. During transcription, mRNA transcribes (copies) DNA. DNA is “unzipped” and the mRNA strand copies a strand of DNA. Once it does this, mRNA leaves the nucleus and goes into the cytoplasm. mRNA will then attach itself to a ribosome. The strand of mRNA is then read in order to make protein. They are read 3 bases at a time. These bases are called codons. tRNA is the fetching puppy. It brings the amino acids to the ribosome to help make the protein. The 3 bases on tRNA are called anti-codons. Remember, amino acids are the building blocks for protein. On the mRNA strand, there are start and stop codons. Your body knows where to start and stop making certain proteins. Just like when we read a sentence, we know when to start reading by the capitalized word and when to stop by the period.



PART B. Answer the following questions on your paper:

1. What is the first step of protein synthesis? _____
2. What is the second step of protein synthesis? _____
3. Where does the first step of protein synthesis occur? _____
4. Where does the second step of protein synthesis occur? _____
5. Nitrogen bases are read _____ bases at a time.
6. The bases on the mRNA strand are called _____.
7. The bases on tRNA are called _____.
8. What is the start codon? _____
9. What are the stop codons? (Use your mRNA chart or pg. 298) _____
10. A bunch of amino acids attached together is called a _____.

PART C. Use your codon chart or the chart on page 298 to determine the amino acid sequence. Remember to read through the strand and ONLY start on AUG and STOP when it tells you to stop. Follow example below:

Example:

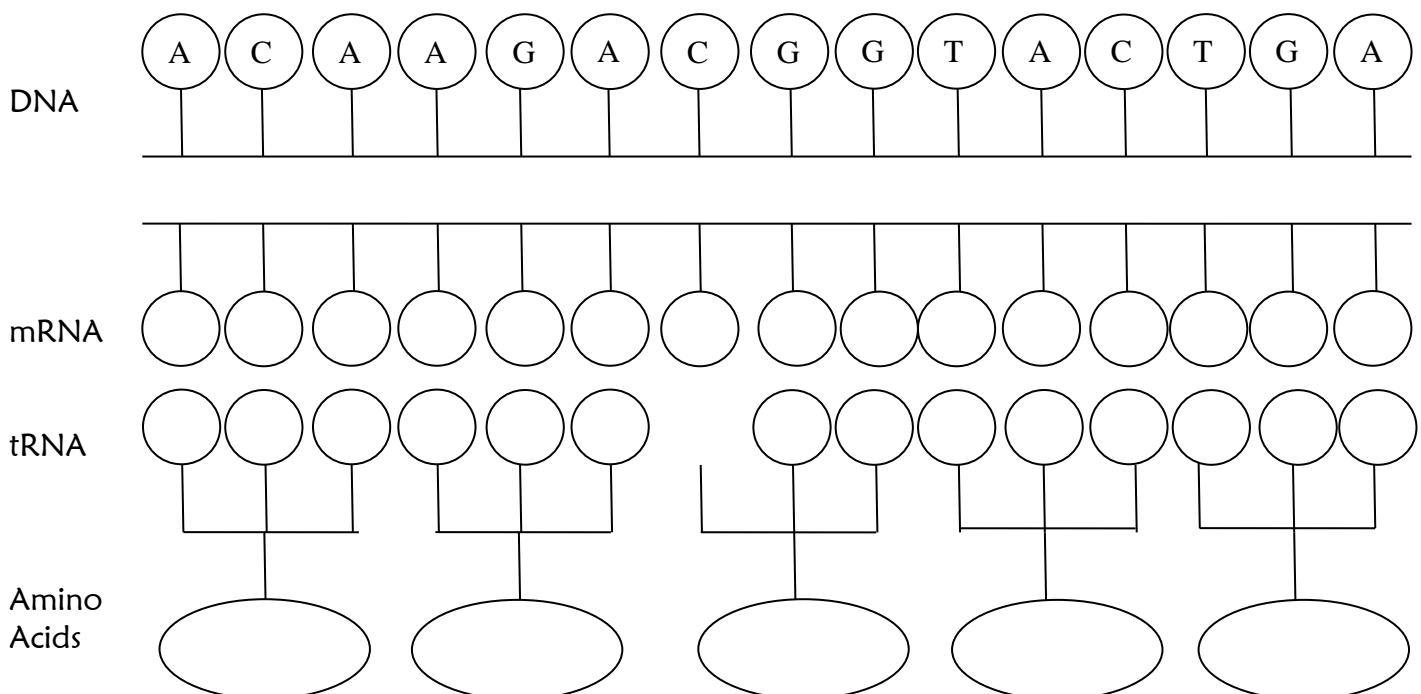
DNA →	AGA	CGG	TAC	CTC	CGG	TGG	GTG	CTT	GTC	TGT	ATC	CTT	CTC	AGT	ATC
mRNA →	UCU	GCC	AUG	GAG	GCC	ACC	CAC	GAA	CAG	ACA	UAG	GAA	GAG	UCA	UAG
protein →			start	- glu	- ala	- thre	- hist	- asp	- glu	- threo	- stop				
				acid				acid							

1. DNA → CCT CTT TAC ACA CGG AGG GTA CGC TAT TCT ATG ATT ACA CGG TTG CGA TCC ATA ATC
mRNA →
protein →
2. DNA → AGA ACA TAA TAC CTC TTA ACA CTC TAA AGA CCA GCA CTC CGA TGA ACT GGA GCA
mRNA →
protein →
3. DNA → TAC CTT GGG GAA TAT ACA CGC TGG CTT CGA TGA ATC CGT ACG GTA CTC GCC ATC
mRNA →
protein →
4. DNA → TAA ACT CGG TAC CTA GCT TAG ATC TAA TTA CCC ATC
mRNA →
protein →
5. DNA → CTA TTA CGA TAC TAG AGC GAA TAG AAA CTT ATC ATC
mRNA →
protein →
6. DNA → TAC CTT AGT TAT CCA TTG ACT CGA ATT GTG CGC TTG CTG ATC
mRNA →
protein →
7. DNA → ACC CGA TAC CTC TCT TAT AGC ATT ACA AAC CTC CGA GCG
mRNA →
protein →
8. DNA → TAC AGA CGG CAA CTC TGG GTG CTT TGT TCT CTT CTC AGT ATC
mRNA →
protein →

Circle the correct choice within the parenthesis for 1 -18.

1. (DNA/RNA) can leave the nucleus.
2. mRNA is made during (transcription/translation).
3. mRNA is made in the (cytoplasm/nucleus).
4. DNA is located in the (nucleus/cytoplasm)
5. (Translation/Transcription) converts DNA into mRNA.
6. (mRNA/rRNA) is used to carry the genetic code from DNA to the ribosomes.
7. (tRNA/rRNA) makes up the ribosome. Look in the book for this.
8. (DNA/RNA) uses uracil instead of thymine.
9. (RNA/amino) acids make up a protein.
11. Transcription takes place in the (nucleus/cytoplasm).
12. tRNA is used in (translation/transcription).
13. tRNA uses (anticodons/codons) to match to the mRNA.
14. Proteins are made at the (nucleus/ribosome).
15. (tRNA/mRNA) attaches the amino acids into a chain.
16. tRNA is found in the (nucleus/cytoplasm).
17. (Translation/Transcription) converts mRNA into a protein.
18. Translation takes place in the (cytoplasm/nucleus).

Fill the Diagram In



REPLICATION, TRANSCRIPTION & TRANSLATION THINKING QUESTIONS

1. DRAW A DNA NUCLEOTIDE & AN RNA NUCLEOTIDE. LABEL EACH OF THE 3 MAJOR PARTS.
 2. WHAT ARE THE THREE MAJOR DIFFERENCES BETWEEN DNA & RNA?
A)
B)
C)
 3. WHAT IS THE **POINT OF DNA REPLICATION**? _____
 4. WHEN & WHERE DOES **REPLICATION** OCCUR? _____
 5. WHAT IS THE POINT OF **TRANSCRIPTION**? _____
 6. WHAT ARE THREE NUCLEOTIDES TOGETHER CALLED ON MRNA? (IE: ACA) _____
 7. THE MRNA CODONS CAN BE USED IN A CHART TO FIND: _____
 8. WHAT MOLECULE CONTAINS AN ANTI-CODON? _____
 9. WHY IS THIS (ANSWER TO #13) MOLECULE SO IMPORTANT?
 10. **TRANSLATION** TAKES PLACE IN THE _____ ON A _____.
 11. WHAT IS THE POINT OF **TRANSLATION**?
 12. TRANSCRIPTION AND TRANSLATION TOGETHER IS THE PROCESS OF _____.
- GRAB A BOOK!!! TURN TO SECTION 11.3**
13. WHAT IS ANY CHANGE IN THE DNA SEQUENCE CALLED? _____
 14. ANY AGENT THAT CAUSES A MUTATION WOULD BE CALLED A _____.
 15. WHAT ARE SOME EXAMPLES OF THINGS THAT CAUSE MUTATIONS?
 16. WHAT ARE THE TWO TYPES OF DNA OR GENE MUTATIONS? GIVE EXAMPLES OF EACH.
A.
B.
 17. WHICH ONE OF THE TWO ABOVE IS MORE DESTRUCTIVE? WHY?
 18. WHAT IS THE DIFFERENCE BETWEEN A *GENE MUTATION* & A *CHROMOSOME MUTATION*?
 19. WHAT ARE THE TYPES OF CHROMOSOME MUTATIONS? EXPLAIN EACH. INCLUDE A PICTURE USE PAGE 306.
A.
B.
C.
D.
 20. ARE MUTATIONS ALWAYS BAD? EXPLAIN YOUR ANSWER.