Topic: Protein Synthesis Worksheet

Summary: Students will practice DNA and RNA base pairing to build a polypeptide. Students will also answer questions about transcription and translation and the central dogma of molecular biology.

Goals & Objectives: Students will be able to apply base pairing rules for DNA and RNA. Students will be able to explain the basics of transcription and translation.

Standards: CA Biology *1d. Students know* the central dogma of molecular biology outlines the flow of information from transcription of ribonucleic acid (RNA) in the nucleus to translation of proteins on ribosomes in the cytoplasm. *4b. Students know* how to apply the genetic coding rules to predict the sequence of amino acids from a sequence of codons in RNA.

Time Length: 30 minutes

Prerequisite Knowledge: Students know the basics of transcription and translation.

Materials:

- Textbook for reference
- Handouts and pencils
- Have the CODON TABLE as a separate sheet so students have easy access.

Procedures:
1. Students work on the handout by themselves.

Accommodations: Students with an IEP can take the handout home if they need extra time, and/or do only the first page of the two page assignment.

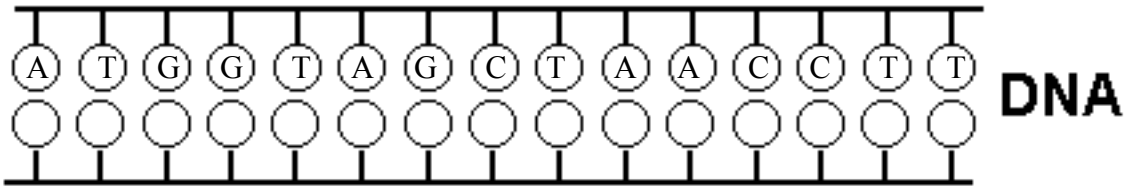
Evaluation:
Each numbered question is worth 1 point for a total of 24 points.

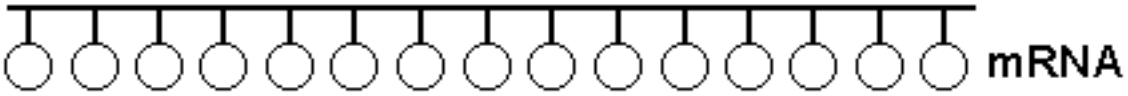
Name: _____ Row: _____

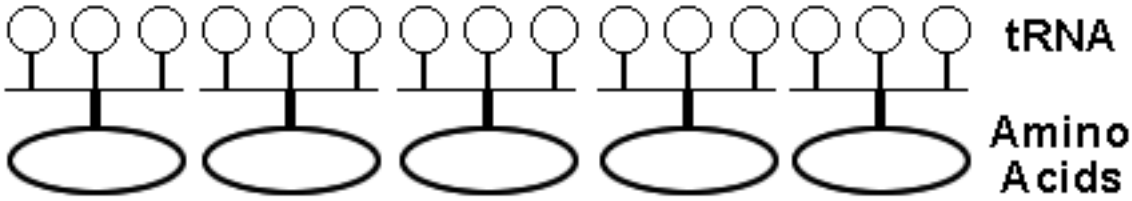
Date:_____ Period:_____

Protein Synthesis Worksheet

Directions:
1st Fill in the complimentary DNA strand using DNA base pairing rules.
2nd Fill in the correct mRNA bases by transcribing the bottom DNA code.
3rd Translate the mRNA codons and find the correct amino acid using the Codon Table
4th Write in the amino acid and the correct anti-codon the tRNA molecule.
5th The answer to the questions about protein synthesis below the amino acids.

1. 

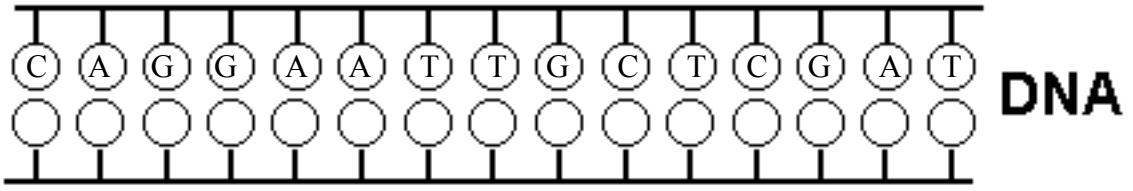
2. 

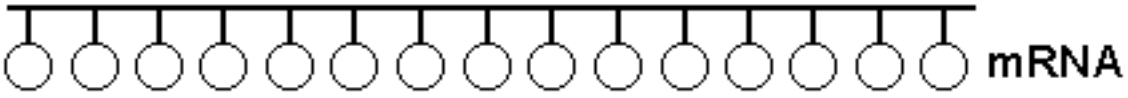
3. 

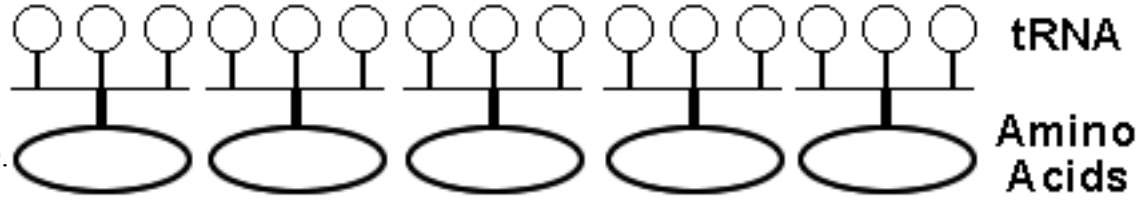
4.

5. mRNA is synthesized in <u>translation</u> or <u>transcription?</u>

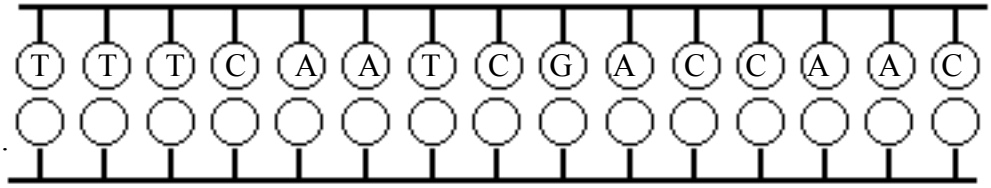
6. mRNA has <u>codon</u> or <u>anti-codons?</u>

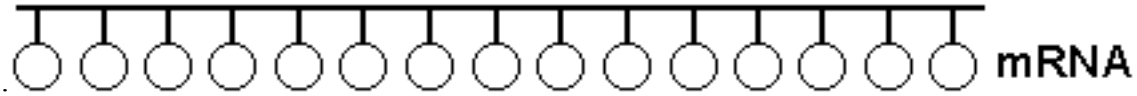
7. 

8. 

9. 

10.

11. 

12. 

13. 

14. 

15. 1 or 3 codons equal one amino acid?

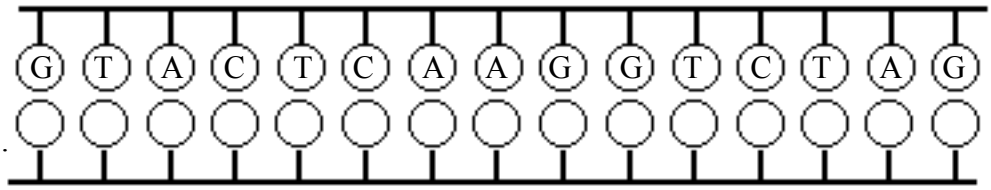
16. tRNA brings amino acids to the nucleus or ribosome?

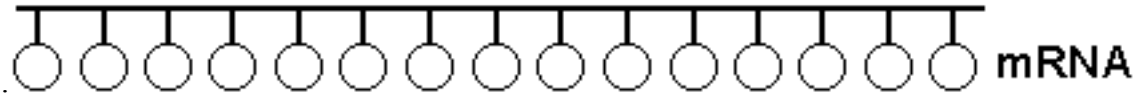
17. A polypeptide is a sequence of proteins or amino acids?

18. tRNA has codons or anti-codons?

19. tRNA transfers amino acids during translation or transcription?

20. Ribosomes are the site where translation or transcription takes place?

21. 

22. 

23. 

24. 

CODON TABLE

1st Base	2nd Base: U	2nd Base: C	2nd Base: A	2nd Base: G	3rd Base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U
	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G