



Topic: Transcription Translation Worksheet

Summary: Students will practice DNA and RNA base pairing to build a protein. Students will also answer questions about transcription and translation.

NGSS Standards: *HS-LS1-1*. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

Time Length: 30 minutes

Prerequisite Knowledge: Students know the base pairing rules, amino acids, DNA / RNA, codons, and cell structures like nuclei and ribosomes.

Materials:

Have the CODON TABLE as a separate sheet so students have easy access.

Class notes or textbook or online textbook:

- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/4.5/primary/lesson/transcription-of-dna-to-rna-bio/>
- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/4.7/primary/lesson/translation-of-rna-to-protein-bio/>
- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/4.6/primary/lesson/genetic-code-bio/>

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.

Editable DOCX File and Answer Key:

Available at www.ngsslifescience.com

Transcription Translation Worksheet

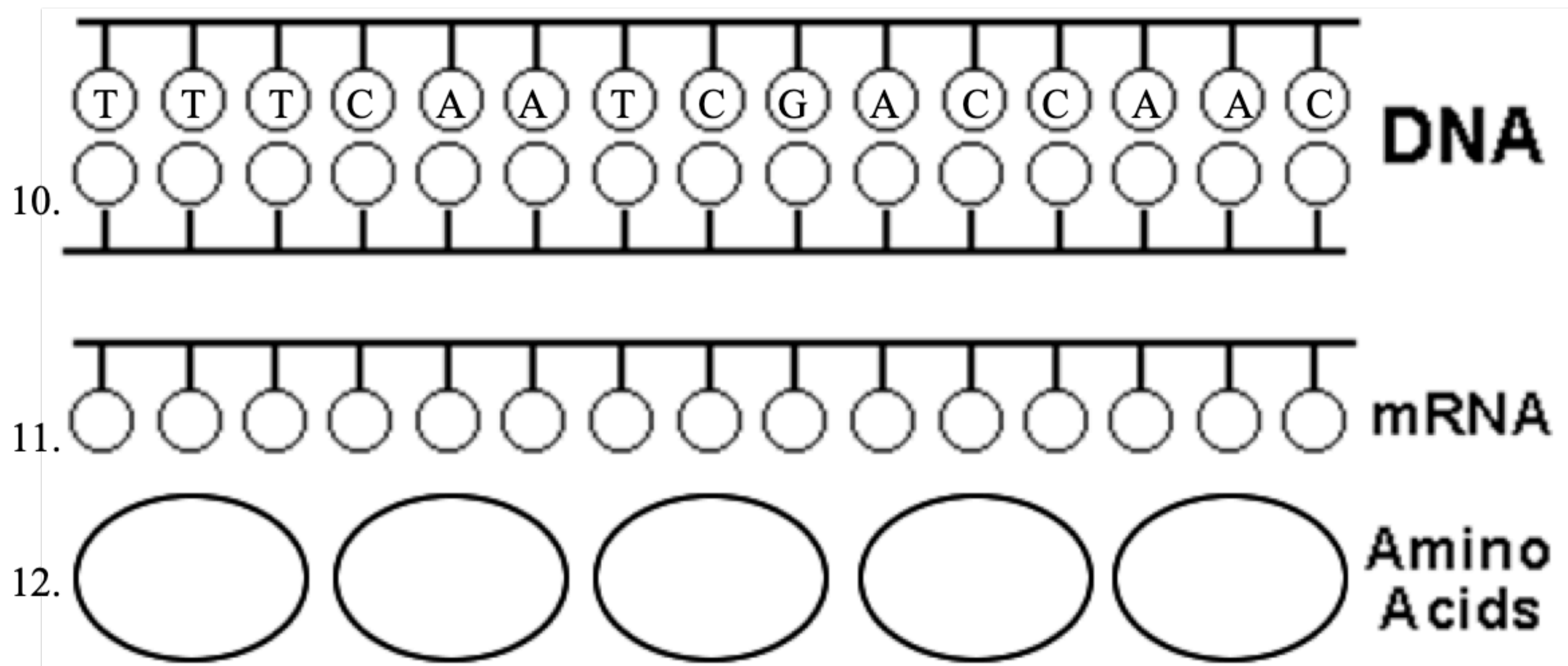
Directions:

- 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 in the large circle.
- 5th Circle the correct answer to each question.

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4. **Circle One:** mRNA is synthesized in translation or transcription.
5. **Circle One:** mRNA has codons or anti-codons.
6. **Circle One:** mRNA is synthesized in the ribosome or nucleus.

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13. **Circle One:** 1 or 3 codons equal one amino acid.

14. **Circle One:** A protein is a sequence of polypeptides or amino acids.

15. **Circle One:** Ribosomes are the site where translation or transcription takes place.

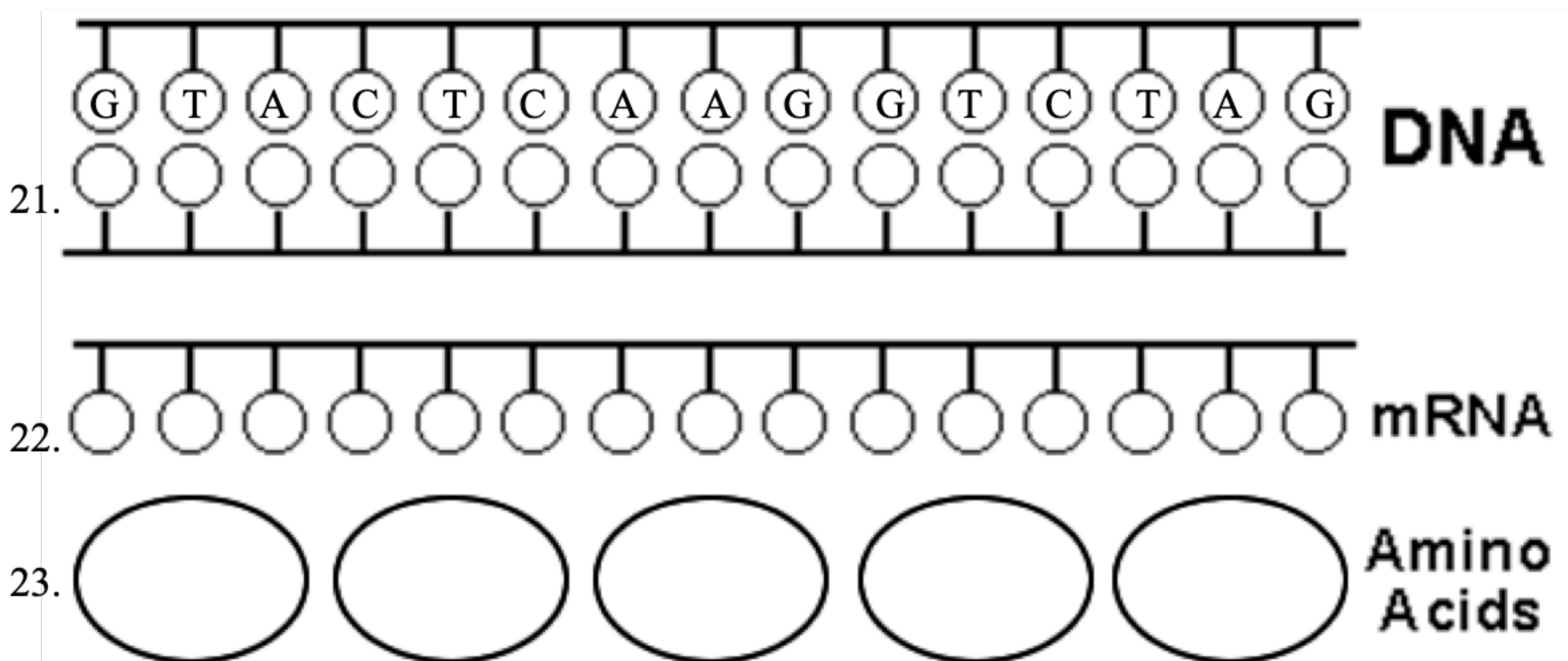
16. **Circle One:** 1 or 3 DNA nitrogen bases equal one amino acid.

17. **Circle One:** There are 20 or 3 different amino acids in humans.

18. **Circle One:** When there is a change in the DNA code, it is called a ribosome or mutation.

19. **Circle One:** When there is a mutation in DNA or RNA, the change is permanent and all of the proteins made afterwards will be affected.

20. **Circle One:** When there is a mutation in DNA or RNA, only a single protein is affected while all of the other proteins will be normal.



CODON TABLE

1 s t B a s e	U	Phenylalanine	Serine	Tyrosine	Cysteine	U C A G	3 r d B a s e
		Phenylalanine	Serine	Tyrosine	Cysteine		
		Leucine	Serine	Stop	Stop		
		Leucine	Serine	Stop	Tryptophan		
C	U	Leucine	Proline	Histidine	Arginine	U C A G	
		Leucine	Proline	Histidine	Arginine		
		Leucine	Proline	Glutamine	Arginine		
		Leucine	Proline	Glutamine	Arginine		
A	U	Isoleucine	Threonine	Asparagine	Serine	U C A G	
		Isoleucine	Threonine	Asparagine	Serine		
		Isoleucine	Threonine	Lysine	Arginine		
		Methionine	Threonine	Lysine	Arginine		
G	U	Valine	Alanine	Aspartic acid	Glycine	U C A G	
		Valine	Alanine	Aspartic acid	Glycine		
		Valine	Alanine	Glutamic acid	Glycine		
		Valine	Alanine	Glutamic acid	Glycine		
		U	C	A	G		
		2nd Base					