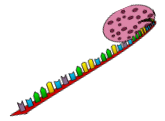


Name: _____

Per: _____



Protein Synthesis Race Web-Lesson Game



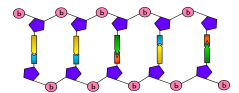
Prior Knowledge: Before beginning the game, use the Learning Scale below to rate your knowledge of protein synthesis. Place a check in the before box. Re-rate yourself after you play the game.

Rating Before You Play	Learning Scale	Rating After You Played
	4 I can teach to others the process of protein synthesis, and explain how enzymes and protein are formed through the processes of transcription and translation.	
	3 I can explain the process of protein synthesis and explain how enzymes and protein are formed through the processes of transcription and translation.	
	2 I can describe some of the process of protein synthesis and define transcription and translation.	
	1 With help, I can identify some of the process of protein synthesis.	
	0 I do not understand the process of protein synthesis, but I plan to learn more in order to understand it.	

Task: Protein Synthesis Race Video Game:

A. Become a protein builder! Click on the link to access the Protein Synthesis Race Video Game at the BioMan Biology Website.

<https://biomanbio.com/HTML5GamesandLabs/LifeChemgames/protsynthracehtml5page.html>



B. Click "Start a New Game" to begin.

C. Read all the game instructions and follow the directions to complete the game. As you complete the game, answer the questions on this handout.

Transcription In the Nucleus

1. Transcription is the process of copying a gene to create _____

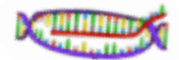
2. Transcription is the first process that must happen in order to make a _____

3. In order for transcription to happen, DNA must _____

4. How many strands of DNA are used for transcription? _____

5. Will you be playing with the top or bottom strip of DNA? _____

6. What is the name of the enzyme used to make RNA nucleotides? _____



****Helpful Hint!** Transcription is different than DNA base pairing! In transcription, the RNA nucleotide Adenine pairs with DNA nucleotide Thymine, and DNA nucleotide Adenine pairs with the RNA nucleotide Uracil. The Cytosine still pairs with the Guanine.

7. What type of molecule did you create when you transcribed all of the nucleotides? _____

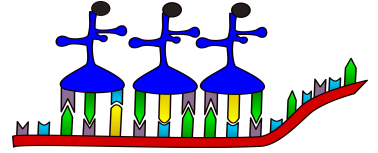
8. What does the messenger RNA (mRNA) do? _____

9. What happens to the DNA molecule after transcription? _____

10. Where does the messenger RNA have to travel to after transcription? _____

Transcription - Did You Get It? Answer the 9 multiple choice questions in the game.

Write down your score here _____



Translation in the Ribosome

- 11. A protein is a chain of _____
- 12. The _____ of amino acids in the chain and the _____ of the chain determine what kind of protein it will be.
- 13. Codons are triplets of nitrogenous bases on mRNA that code for a specific _____
- 14. Which type of RNA is responsible for translation of mRNA? _____

***Hint! Look at the chart at the upper right of the screen to see what codons code for which amino acid! Pick up the complementary tRNA anticodon to pair with the mRNA codon. When you are pairing the two codons, look at the mRNA code to pair with the correct amino acid color. Use the black line above the tRNA to pick up the correct color. Each code for amino acids is a specific color!*

- 15. What is another name of a chain of amino acids? _____
- 16. What happens to the ribosome after translation? _____
- 17. What does the shape of a folded polypeptide indicate? _____

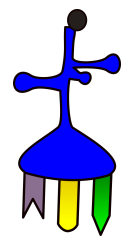
Translation - Did You Get It?

Click on the correct term where the arrow or bracket is indicating. How many did you get correct? _____

Answer the 8 multiple-choice questions. Write your score here: _____

Summary

- 18. Write your total time here: _____
- 19. Write your percent correct here: _____ %



Hint!!! Remember to Re-Rate Your Learning on the Learning Scale on Page 1

20. In 4 or more complete sentences, describe the process of protein synthesis and explain how transcription and translation create proteins.

Optional Bonus Points!

On a separate sheet of paper, draw a diagram of mRNA and tRNA during the process of translation. Label codons, anticodons, tRNA, mRNA, ribosome, and polypeptide in your diagram.