

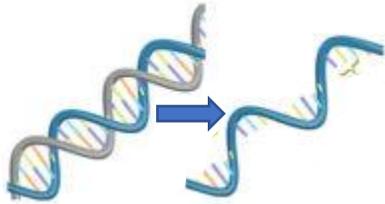
Name: \_\_\_\_\_

Test Date: \_\_\_\_\_

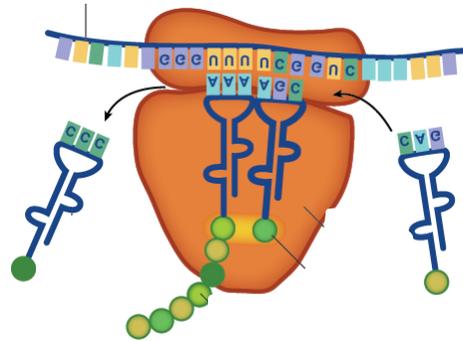
### Protein Synthesis and Cell Energy Review

**REMEMBER, this is a REVIEW! It is not the same as the test. You must be able to apply this information to scenarios and data.**

**Study the diagrams below.**



**Diagram 1**



**Diagram 2**

1. What is the process in diagram 1? \_\_\_\_\_
2. What is the product in diagram 1? \_\_\_\_\_
3. What is the process in diagram 2? \_\_\_\_\_
4. What is the product in diagram 2? \_\_\_\_\_
5. Which diagram shows the genetic code being changed to an amino acid chain? \_\_\_\_\_
6. Which diagram shows nucleotides being assembled in an mRNA chain? \_\_\_\_\_
7. Name 3 organelles directly related to handling the proteins during and after production.  
 \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
8. Find the amino acid for CGA \_\_\_\_\_ and AAG \_\_\_\_\_.
9. Transcribe: 3' TACGCCGATCCGCTACT 5'  
 \_\_\_\_\_

		Second Letter				
		U	C	A	G	
First Letter	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 (START)	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartate	Glycine	U	
	Valine	Alanine	Aspartate	Glycine	C	
	Valine	Alanine	Glutamate	Glycine	A	
	Valine	Alanine	Glutamate	Glycine	G	

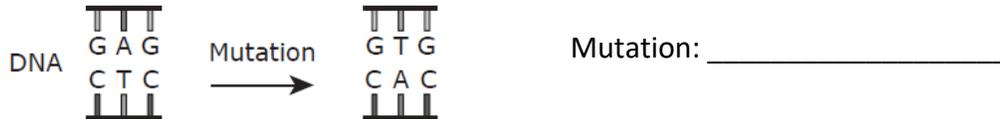
**Use the codon chart on the previous page to answer the question below.**

10. You are given the **DNA** triplet 3' AGG 5'. Which of the following will change the amino acid strand made resulting in a mutation? Circle your answer(s).

AGT            TCA            TCG            TCC            AGC            ACG

**What type of mutations are illustrated below? Substitution, Deletion or Insertion**

11.



12.



13. Nitrogenous bases are added. Mutation: \_\_\_\_\_

14. Nitrogenous bases are removed. Mutation: \_\_\_\_\_

15. When does a mutation NOT affect the protein?

16. When DNA is transcribed in error, what is directly affected? \_\_\_\_\_

- a. tRNA bonding to mRNA
- b. mRNA leaving nucleus
- c. mRNA codon sequence
- d. bonding of amino acids

17. (PreAP only) Explain how introns and exons function when primary RNA is made.

---

---

---

18. Gene regulation (turning genes on and off) leads to

- a. cells that have specialized functions
- b. cells that are all the same
- c. the mutation of DNA
- d. the removal of DNA

19. The pictures of this rabbit were taken at two different times of the year, winter and summer. What likely affected gene expression of fur color?

\_\_\_\_\_



20. The pictures below represent butterflies that developed one exposed to green light and one exposed to red light. What likely affected gene expression of wing color?

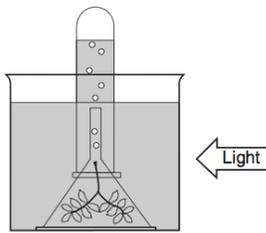
\_\_\_\_\_



**Draw a DNA and mRNA structure below. Label nucleotides, phosphates, sugars, hydrogen bonds, nitrogenous bases and location of the genetic code.**

## Cell Energy Review: Photosynthesis and Cellular Respiration

1. Describe the relationship between products of photosynthesis and reactants of cellular respiration.
2. Which organelle absorbs sunlight for photosynthesis? \_\_\_\_\_
3. Which organelle in a plant and animal uses glucose energy for cellular respiration?  
\_\_\_\_\_
4. What gas is produced through photosynthesis? \_\_\_\_\_
5. What gas is produced through cellular respiration? \_\_\_\_\_
6. What gas is produced in the image below? \_\_\_\_\_ How do you know?  
\_\_\_\_\_



7. Trace the gases used and produced through photosynthesis and cellular respiration.
8. What are the reactants of photosynthesis? \_\_\_\_\_
9. What are the products of cellular respiration? \_\_\_\_\_
10. Through what process does the body get energy it needs to function?
11. What is the difference between aerobic and anaerobic respiration?
12. Which produces more ATP, aerobic or anaerobic respiration? \_\_\_\_\_

**Brainstorm everything you know about photosynthesis and cellular respiration below. You may use images, words, symbols, etc:**