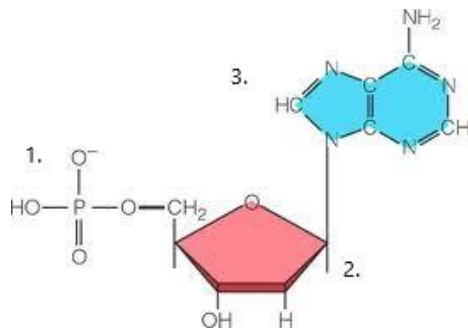


Final Exam Study Guide – Unit 6: Molecular Genetics

1. Label the parts of a nucleotide:



1. _____
 2. _____
 3. _____

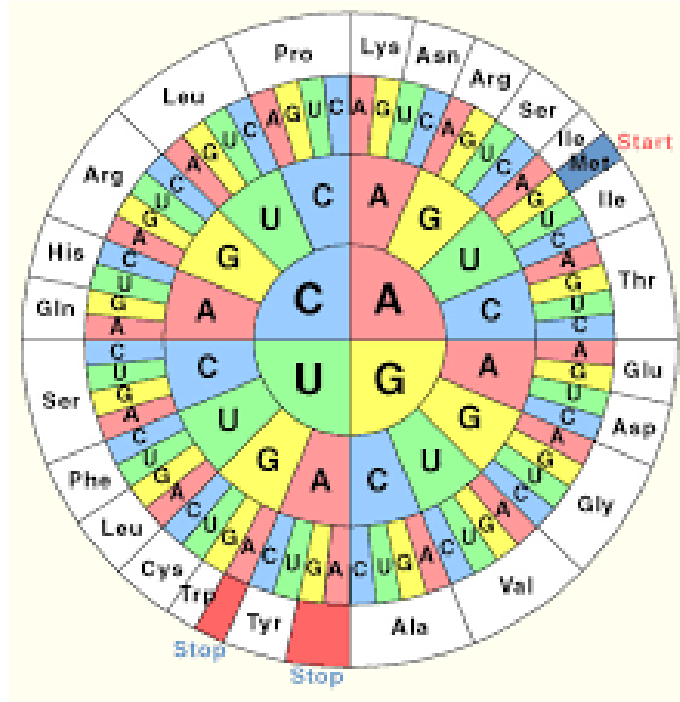
2. Complementary base pair rules in DNA are: Adenine pairs with _____ and Cytosine pairs with _____. In RNA, adenine pairs with _____ because there is no thymine in RNA.
3. Fill in the chart showing difference between DNA and RNA.

	DNA	RNA
Number of strands		
Sugar		
Bases		
Function		
Where found		

4. Segments of DNA that code for a protein are called _____.
5. _____ are DNA wrapped up with proteins.
6. There are 3 types of RNA. Write the type of RNA next to the description.
- _____ - single stranded, is a complimentary copy of the information on DNA
 - _____ - is t shaped, brings in amino acids to build protein
 - _____ - combines with proteins to form a ribosome, the site of protein synthesis
7. The central dogma describes how proteins are made the same way in all organisms:
 During transcription a gene on DNA is used to make _____ and this occurs in the _____ of the cell.
 During translation, info in mRNA is used to make a _____ and this occurs in the _____ of the cell.
8. Fill in the blanks for the steps of transcription:
- The _____ enzyme speeds up the reaction to unwind and unzip the DNA, only opening a segment (gene) coding for 1 protein.
 - The _____ enzyme speeds up the reaction of bringing in RNA nucleotides to

match up with the open bases on the DNA.

3. The completed _____ detaches and moves out of the nucleus.
9. The 3 base sequence that is on mRNA is called the _____, whereas the 3 base sequence on tRNA is called the _____.
10. Fill in the blanks for the steps of translation:
 1. mRNA joins with _____ and initiates translation at the _____ codon.
 2. The first _____ comes into the ribosome, matching up its anticodon with the codon on the mRNA and brings the corresponding _____.
 3. A second _____ comes into the ribosome, bringing its specific amino acid. The two amino acids form a bond.
 4. The ribosome moves down the mRNA and reads the next codon and a new tRNA comes in with its amino acid, which bonds to the growing peptide chain.
 5. The process stops when a _____ codon is reached and the protein is released.
11. Codons code for specific amino acids which creates the _____ code. This code is the same for all organisms on earth.
12. If given a DNA sequence of ACGTCGAAC, the mRNA sequence would be _____. This would result in the amino acid sequence of _____.



13. When a gene is transcribed and translated to make a protein, the gene is being (circle one) **expressed** / not expressed.
14. Match up the DNA mutation with its description:

_____ Silent	a. a point mutation where one amino acid is substituted for another
_____ Nonsense	b. a frameshift mutation where DNA bases are added
_____ Missense	c. a single base change in DNA sequence

_____ Point/Substitution	d. every amino acid after mutation is changed
_____ Frameshift	e. a point mutation which result in a stop codon
_____ Insertion	f. a frameshift mutation where DNA bases are removed
_____ Deletion	g. a point mutation where the amino acid sequence is unchanged

15. _____ involves using living organisms to produce materials. This provides potential uses in the medical field, agriculture, and food production.
16. A major technique in genetic engineering is cutting a gene from one organism and splicing it into the DNA of another organism. This technique is known as _____.
17. Cutting DNA into fragments involves the use of _____ enzymes.
18. _____ is a promising treatment for genetic disorders where normal genes are inserted to replace defective genes.
19. _____ therapy is a new treatment for certain diseases that takes unspecialized cells to replace destroyed or damaged cells in different parts of the body.