Name _____ Date _____ Period _____

RNA and Protein Synthesis Notes Organizer

1. What is the ***central dogma*** of Biology?

2. RNA, like DNA, is a nucleic acid made of nucleotides. What are the **four differences** between DNA and RNA?
   a.

   b.

   c.

   d.

3. Describe the functions of the *three types of RNA molecules*.
   a. mRNA –

   b. rRNA –

   c. tRNA –

4. **Transcription:** _____ → _____

5. What is ***transcription***?

6. Where does transcription occur in the cell?

7. DNA must first be "read" and transcribed by RNA because:

8. Following transcription, what would be the complementary **mRNA sequence** to this strand of DNA?

   a. **DNA: AGC TCC GAT GCA TAC TTG CCA**

9. A _____ is a **3 base mRNA sequence** that codes for a particular _____.

    a. There are _____ different *amino acids*.

    b. Amino acids join together to form _____.

10. **Translation:** _____ → _____

11. What is ***translation***?

12. Where does translation occur in the cell?

13. Describe the overall process of translation:

    a.

    b.

    c.

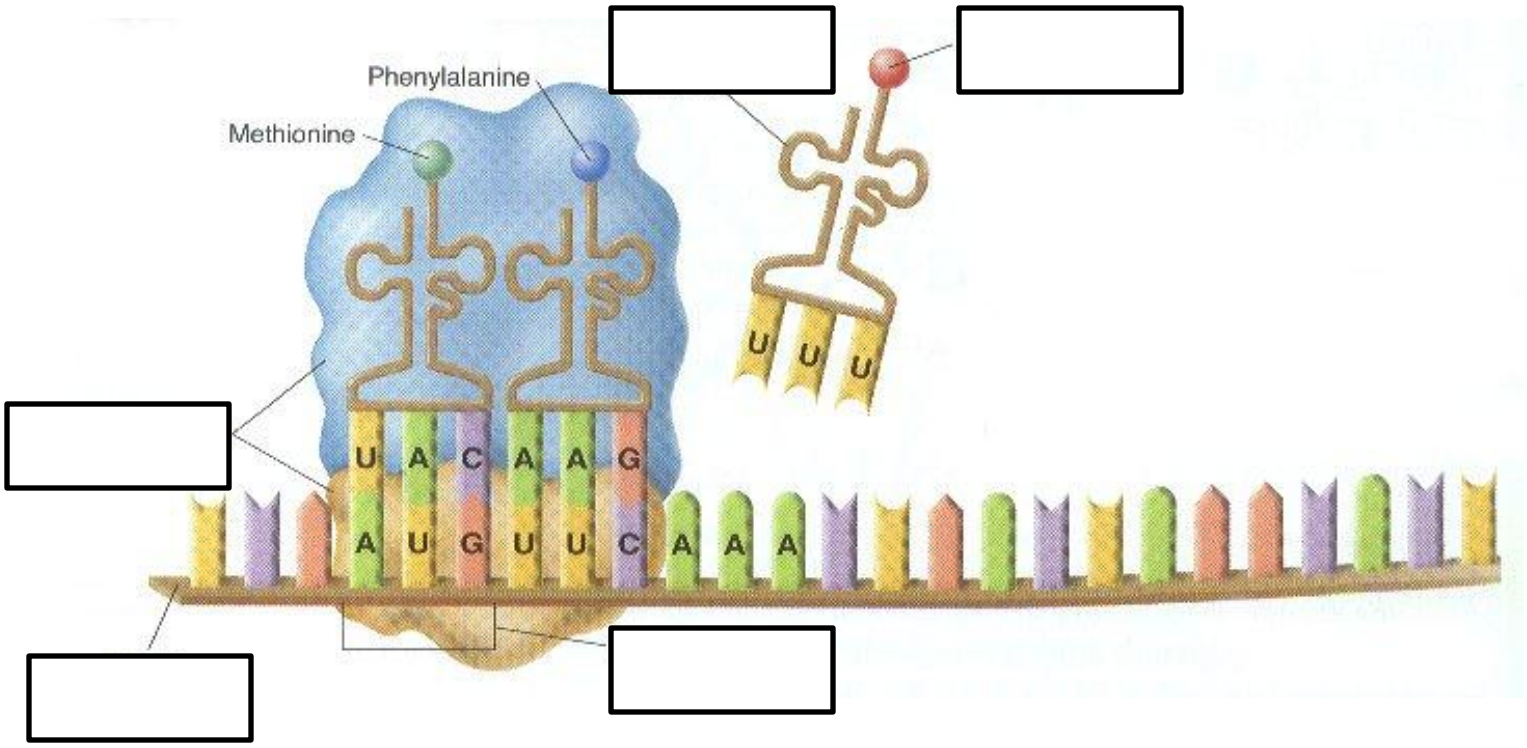
    d.

    e.

    f.

14. The tRNA _____ ensures that the right amino acid is added to the chain.

15. Label the process of translation:



16. What is a ***mutation***?

17. Describe the *two types of mutations*.

    a. **Gene mutations:**

    b. **Chromosomal mutations:**

18. Mutations that occur in ***somatic cells*** are _____ passed on to the next generation.

19. Mutations that occur in ***sex cells*** are passed on and will be present in _____ cell in the offspring.

20. *Point mutations* involve the changing of _____ nitrogen base.

    a. **Substitution:**

21. *Frameshift mutations* alter the "reading frame" of the genetic code.

    a. **Insertion:**

    b. **Deletion:**

22. Use the following sentence to illustrate substitution, insertion, and deletion mutations:

THE BIG FAT CAT ATE THE WET RAT

a. Substitution:

b. Insertion:

c. Deletion:

Test your knowledge of the following processes by placing the descriptions in the correct box. Keep in mind, you may use each phrase more than once!

DNA → mRNA **mRNA → Proteins** **DNA → DNA** **Copying of DNA for cell division**

Protein Synthesis **Occurs in the nucleus** **Occurs in the ribosome**

Allows the "genetic message" to leave the nucleus **DNA Helicase** **DNA Polymerase**

RNA Polymerase **Amino acids join together to form proteins** **Peptide Bonds**

DNA **mRNA** **rRNA** **tRNA** **Codon** **Anticodon**

Replication	Transcription	Translation