

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

### Transcription and Translation Review

1. RNA is a different nucleic acid and differs from DNA on 3 things:
- RNA contains \_\_\_\_\_ (base) instead of \_\_\_\_\_ which is in DNA
  - RNA is a \_\_\_\_\_ stranded molecule, DNA is a \_\_\_\_\_ stranded molecule.
  - RNA is named after the sugar it contains, which is \_\_\_\_\_. DNA is named after the sugar it contains, which is \_\_\_\_\_.

2. What is the process called that makes a copy of DNA in an RNA form, for the purpose of making proteins?

3. There are 3 different types of RNA: Messenger RNA (mRNA), transfer RNA (tRNA), ribosomal RNA (rRNA). In order to make proteins, DNA is transcribed into mRNA. If the following is the sequence of an mRNA, what would be the DNA sequence:

A U C G G G G A A U U A C C C G U U A A

If this is a DNA sequence, what would be the mRNA sequence:

T A T C C C G G A G A G G T C C A A T G C

4. What is the function of tRNA?

5. What is the function of rRNA?

6. What enzyme binds to DNA and is responsible for making a transcript (RNA) of the DNA?

During transcription, a gene is activated and genetic information encoded in DNA is transferred to an RNA molecule. The RNA is eventually translated into a protein. This process is called \_\_\_\_\_.

8. Proteins are one of the macromolecules in our cells. They are made of monomers called \_\_\_\_\_.

Note: 20 different amino acids make up our proteins and they can be arranged in different orders, making different proteins. Proteins are responsible for most of what happens in our cells. They have a structural role (cytoskeletal system that holds the shape of the cell), catalyst role (enzymes that speed up reactions by reducing the activation energy-energy required to allow the reaction to take place), functional role (such as proteins that carry molecules and organelles across the cell), proteins that function as transporters, allow molecules to get in and out of the cell, etc. Given that proteins do just about everything in the cell and the DNA codes for these proteins, the DNA contains almost all the information the cells need to produce parts that make them function.

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The mRNA is used as a template to produce proteins. What is the process of make proteins called?

What is a codon?

11. What is an anticodon?

12. What is the Start codon? What are the stop codons?

13. What part of the cell is used for translation?

14. What amino acid each of the following codons code for?

AUG

UAG

UAA

UGA

GAU

CAC

15. What would the mRNA sequence below code for (write the amino acid sequence):

AUG GAC ACA CAU UUA UUC UGU GUC UGA

16. How would the sequence change if it was mutated at the end into:

AUG GAC ACA CAU UUA UUC UGU GUC UGG

How would the protein be affected?

17. What are the anticodons for the following mRNA strand:

CUC AAG ACC GUA UGG GGU

18. What is a polypeptide?

19. In order for protein synthesis to occur, the mRNA must migrate to the \_\_\_\_\_.

20. Long chains of amino acids (peptides) make up a \_\_\_\_\_ (a macromolecule)