

Skills Worksheet

Directed Reading

Section: RNA and Gene Expression

In the space provided, write the letter of the description that best matches the term or phrase.

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|---------------------------------|--|
| _____ 1. ribonucleic acid (RNA) | a. the entire process by which genes are used to build proteins/traits. |
| _____ 2. uracil | b. a molecule made of linked nucleotides |
| _____ 3. transcription | c. the process of reading instructions on an RNA molecule to put together the amino acids that make up a protein |
| _____ 4. translation | d. the process of transferring a gene's instructions for making a protein to an RNA molecule |
| _____ 5. gene expression | e. a nitrogenous base used in RNA instead of the base thymine found in DNA |

Complete each statement by underlining the correct term or phrase in the brackets.

- Transcription begins when [RNA / RNA polymerase] binds to the gene's promoter.
- RNA polymerase adds complementary [DNA / RNA] nucleotides as it "reads" the gene.
- In eukaryotes, transcription takes place in the [nucleus / cytoplasm].

Read each question, and write your answer in the space provided.

9. What are two differences between transcription and DNA replication?

10. What determines where on the DNA molecule transcription begins and where it ends?

Directed Reading *continued*

In the space provided, explain how the terms in each pair are related to each other.

11. RNA, messenger RNA

12. codons, genetic code

Study the following six steps in the synthesis of proteins. Determine the order in which the steps take place. Write the number of each step in the space provided.

- _____ 13. The codon following the start codon then receives the tRNA molecule with the complementary anticodon. The tRNA carries the amino acid specified by the codon.
- _____ 14. Steps 2–5 are repeated until a stop codon is reached. The newly made protein is released into the cell.
- _____ 15. The first tRNA detaches, leaves behind its amino acid, and moves away from the ribosome.
- _____ 16. Enzymes help form a peptide bond between the amino acids of adjacent tRNA molecules.
- _____ 17. The tRNA (with its growing protein chain) and mRNA move one codon down, and the next codon is ready to receive the next tRNA and its amino acid.
- _____ 18. An mRNA, the ribosome, and a tRNA carrying the amino acid methionine bind together. The tRNA bonds to the “start” codon AUG.