

Unit 6: DNA, RNA, and Protein Synthesis

Celebration of Learning Review Guide

Vocabulary:

| | | |
|-----------------------------|----------------------|------------------------|
| Adenine | Double Helix | Pyrimidine |
| Anti-codon | Guanine | Ribonucleic acid (RNA) |
| Codon | Messenger RNA (mRNA) | RNA polymerase |
| Cytosine | Mutagen | Thymine |
| Deoxyribonucleic acid (DNA) | Mutation | Transcription |
| DNA helicase | Nitrogenous base | Transfer RNA (tRNA) |
| DNA polymerase | Nucleotide | Translation |
| DNA replication | Purine | Uracil |

Concepts:

Structure of DNA

1. Describe the contributions of the following scientists to the discovery of the structure of DNA → Franklin, Wilkins, Watson, and Crick.
2. What two scientists are credited with discovering the chemical structure of DNA?
3. Which scientist took the x-ray crystallography image titled Photo 51?
4. Draw and label the 3 parts of a DNA nucleotide.
5. What makes up the backbone of the DNA double helix? How are they held together?
6. What is the difference between purine and pyrimidine bases?
7. Which nitrogenous bases are purines? Which bases are pyrimidines?
8. If 6 nucleotide bases on one strand of DNA are CTGCTA, what are the six bases on the complementary strand of DNA?
9. Why does a cell need to copy its DNA?
10. Show how DNA replicates using a template.
11. What is the role of DNA helicase in DNA replication? What is the role of DNA polymerase in DNA replication?

Transcription and Translation

1. How does DNA control the cell? What is the “flow” of the information through the cell?
2. Where in the cell does replication take place? Where in the cell does transcription take place? Where in the cell does translation take place?
3. List 3 major differences between DNA and RNA.
4. Describe the roles that each type of RNA plays during transcription and translation.
5. mRNA is divided into groups of three called _____. Each of these codes for one _____.

- How does a tRNA molecule match up with mRNA during translation?
- Know how to use an amino acid chart (this will be provided for you on the test). For example, what is the sequence of amino acids for the DNA strand reading TACCGGATGTCATT? (Remember what actually codes for the amino acids – is it DNA?)
- What molecules are bonded together during translation forming a long chain? What is the end product of translation?
- Why is a base substitution often less harmful than a base insertion or deletion?
- How could a mutation be *helpful* to an organism?

