

## REVIEW

# Chapter 7

## Nucleic Acids and Protein Synthesis

Complete the paragraph by filling in the blanks using the words from the list below.

thymine  
guanine  
uracil  
amino acid  
sugar

DNA  
messenger  
codon  
protein  
three-base

double helix  
phosphate  
organic bases  
nucleic acid  
transcription

replication  
strand  
hydrogen bond  
proteins

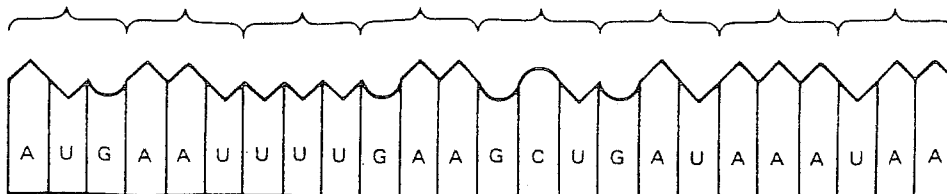
In the living world there are millions of different kinds of \_\_\_\_\_. How are these made by cells? It has been found that protein synthesis in a cell is controlled by a complex macromolecule called \_\_\_\_\_. This compound is not a protein but a \_\_\_\_\_. A nucleic acid is made up of three parts: a 5-carbon \_\_\_\_\_ molecule, a nitrogen-containing \_\_\_\_\_, and a \_\_\_\_\_ group. DNA looks like a ladder twisted into a shape known as a \_\_\_\_\_. Each side of the "ladder" is a long strand made of connecting nucleic acids. Each base is joined by a weak \_\_\_\_\_ to a base on the other strand forming "rungs" on the ladder. The bases form complementary pairs: adenine bonds with \_\_\_\_\_; cytosine bonds with \_\_\_\_\_. During DNA \_\_\_\_\_, the hydrogen bonds break and each strand finds new complementary bases.

In the nucleic acid, RNA, adenine always pairs with \_\_\_\_\_. There are three kinds of RNA. \_\_\_\_\_ RNA carries genetic information from the nucleus to the cytoplasm. During \_\_\_\_\_, information is transferred from DNA in the nucleus to mRNA. The DNA molecule opens up and the mRNA forms a single complementary \_\_\_\_\_. The four bases of RNA can be combined into 64 different \_\_\_\_\_ combinations. Each triplet, known as a \_\_\_\_\_, codes for one specific \_\_\_\_\_. The order of the triplets will determine the order of the amino acids in the \_\_\_\_\_ synthesized.

**SKILLS EXERCISE**  
Sequencing

**Chapter 7**  
**Nucleic Acids**  
**and Protein Synthesis**

A. Do you understand how mRNA codes for amino acids? Use the chart to decode the following message from a strand of RNA.



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

B. The triplets that code for the amino acids on the mRNA are codons. The complementary triplet(s) on tRNA are known as anticodons. Fill in the proper triplets in the table.

Amino acid	Codon	Anticodon
proline	_____	_____
threonine	_____	_____
tryptophan	_____	_____
leucine	_____	_____
arginine	_____	_____
histidine	_____	_____
glycine	_____	_____
serine	_____	_____

AMINO ACID	mRNA CODONS
ALANINE	GCU
ARGININE	CGU
ASPARAGINE	AAU
ASPARTIC ACID	GAU
CYSTEINE	UGU
GLUTAMIC ACID	GAA
GLUTAMINE	CAA
GLYCINE	GGU
HISTIDINE	CAU
ISOLEUCINE	AUU
LEUCINE	UUA
LYSINE	AAA
METHIONINE	AUG
PHENYLALANINE	UUU
PROLINE	CCC
SERINE	UCU
THREONINE	ACU
TRYPTOPHAN	UGG
TYROSINE	UAU
VALINE	GUU
stop codon	UAA

C. Now use any of the codons to make up your own sequence for five or more amino acids. Don't forget to stop and start your message.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_