

Name: \_\_\_\_\_

Blk: \_\_\_\_\_ Date: \_\_\_\_\_

**Structure of DNA**  
**BC Biology 12 p. 112-114**

1. What are the two basic types of nucleic acids?

Name	Abbreviation	Function
deoxyribonucleic acid	DNA	-stores genetic info.
ribonucleic acid	RNA	-functions in protein synthesis

2. What is DNA composed of?

nucleotides

3. What are the three components of a nucleotide?

a. phosphate group

b. sugar (pentose)

c. nitrogenous base

4. What type of sugar is deoxyribose if you based the name on the number of carbons present?

pentose

5. Why is adenine called a nitrogenous base?

it contains nitrogen

6. What type of bond joins the nitrogenous bases together?

hydrogen bonds

7. How many hydrogen bonds exist between A and T?

2

8. How many hydrogen bonds exist between C and G?

3

9. What are the names of the 4 nitrogenous bases? What are their abbreviations?

a. Adenine - A

b. cytosine - C

c. Thymine - T

d. guanine - G

10. According to the principle of complementary base pairing. Adenine always pairs with

thymine. Cytosine always pairs with guanine.

11. What part of the nucleotide forms the "rungs" of the DNA ladder?

nitrogenous bases

12. What two parts of the nucleotide form the "sides" of the DNA ladder?

a. phosphate

b. sugar (deoxyribose)

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**DNA Replication**  
**BC Biology 12 p. 116**

1. What occurs in a cell, just prior to cell division?

DNA Replication

2. Why does this occur?

- to ensure identical copies of its genes are passed on to each daughter cell.

3. What is the first step in replication?

DNA uncoils/unwinds

4. The two physical changes that the enzyme brings about:

(ENZYME: HELICASE)

- a) untwisting of the DNA double helix
- b) separation of the 2 strands

5. What is the name of the site of separation?

Replication Fork

6. How does each strand of the original molecule play a part in the creation of new DNA?

it serves as a template for the complementary strand

7. Explain the origin of the terms:

- a) Leading strand: new DNA is constructed as molecule unwinds, addition site is near replication fork
- b) Lagging strand: constructed in opposite direction, starts at fork and works away.

8. How do the bases of the nucleotides pair?

A - T                      C - G

9. What determines the order of bases on the new strands?

original template strand

10. How do the sequences of the daughter DNA molecules compare to that of the parent DNA?

Identical

11. What kind of bond, formed between what parts of the structure, holds the two strands together?

Hydrogen bonds, between complementary bases

12. Each daughter cell inherits a DNA double helix that is composed of a(n) old parental strand and a(n) new daughter strand. The name for this type of replication is Semi-conservative.

13. Add on a complementary strand of DNA to the following sequence:

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