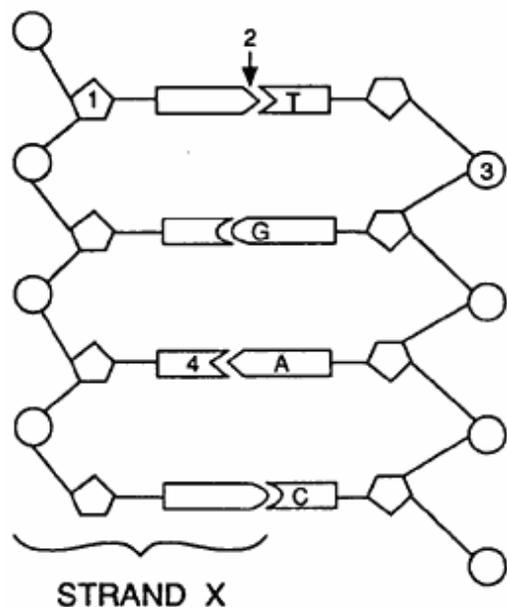


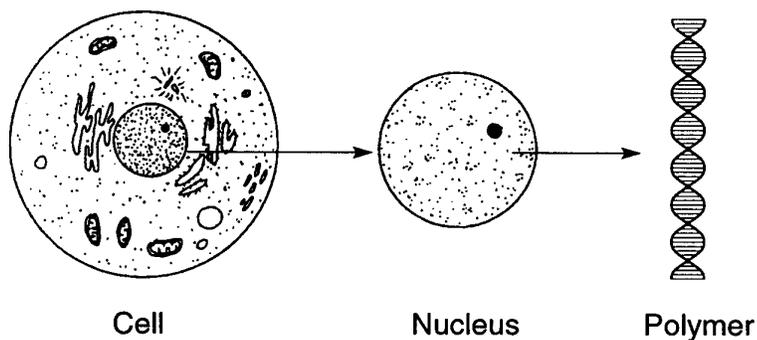
DNA Structure Review

1. Base your answer to the following question on the diagram below of a DNA molecule and on your knowledge of biology.



Which activity occurs in the process of replication?

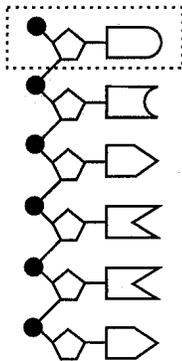
- A) Structure 1 is hydrolyzed.
 - B) A chemical bond is broken in region 2.**
 - C) Structure 3 is synthesized.
 - D) Proteins are formed in region 2.
2. Base your answer to the following question on the structure and location of a cellular component represented in the diagram below.



What does this polymer in the diagram *most likely* contain?

- A) ATP
 - B) DNA**
 - C) enzymes
 - D) lipids
-

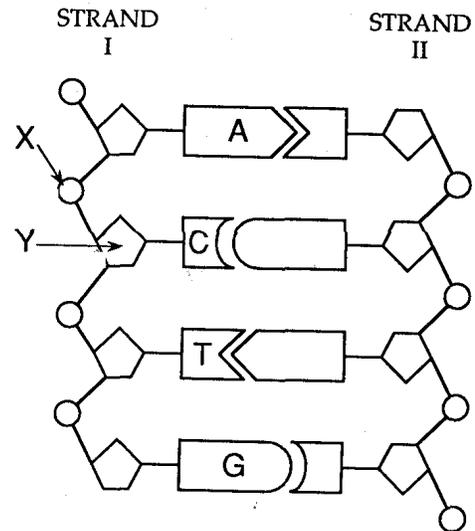
3. Which statement best describes the relationship between cells, DNA, and proteins?
- Cells contain DNA that controls the production of proteins.**
 - DNA is composed of proteins that carry coded information for how cells function.
 - Proteins are used to produce cells that link amino acids together into DNA.
 - Cells are linked together by proteins to make different kinds of DNA molecules.
4. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents a portion of a strand of a DNA molecule.



The entire structure enclosed within the dotted line represents a

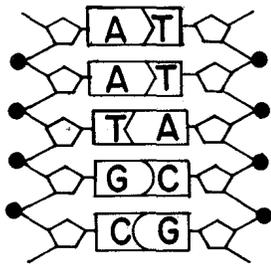
- deoxyribose molecule
- nitrogenous base
- phosphate
- nucleotide**

Base your answers to questions 5 through 7 on the diagram below which represents a portion of a DNA molecule and on your knowledge of biology.



5. The correct sequence of bases in strand II would be
- thymine, guanine, adenine, cytosine**
 - uracil, guanine, adenine, cytosine
 - adenine, cytosine, guanine, thymine
 - cytosine, adenine, guanine, uracil
6. Structure X represents
- the base uracil
 - a deoxyribose sugar
 - a glucose sugar
 - a phosphate group**
7. Structure Y represents
- | | |
|----------|-------------------|
| A) a fat | B) a sugar |
| C) water | D) protein |

Base your answers to questions 8 through 10 on the diagram below which represents a segment of a DNA molecule and on your knowledge of biology.



8. If the segment of DNA represented by the diagram was used as a template in the synthesis of messenger RNA, which sequence represents the order of bases found in the messenger RNA molecule?
- A) U-U-A-C-G B) T-T-A-G-C
C) A-A-T-C-G D) T-T-U-G-C
9. This DNA molecule acts as a template for RNA construction in the process of
- A) gene replication **B) protein synthesis**
C) osmosis D) synapsis
10. A change in the base sequence in this DNA molecule is known as
- A) homeostatic control
B) gene segregation
C) disjunction
D) a gene mutation
-
11. The basic unit of the DNA molecule is
- A) **a nucleotide** B) an amino acid
C) a phosphate group D) a nitrogen base

12. Base your answer to the following question on the information below and on your knowledge of biology.

In 1973, Stanley Cohen and Herbert Boyer inserted a gene from an African clawed frog into a bacterium. The bacterium then began producing a protein directed by the code found on the inserted frog gene.

Analysis of the DNA from both the frog and the bacterium would reveal that

- A) frog DNA is single stranded, but bacterial DNA is double stranded
B) frog DNA contains thymine, but bacterial DNA contains uracil
C) DNA from both organisms is composed of repeating nucleotide units
D) DNA from both organisms contains the sugar ribose
13. A small amount of DNA was taken from a fossil of a mammoth found frozen in glacial ice. Genetic technology can be used to produce a large quantity of identical DNA from this mammoth's DNA. In this technology, the original DNA sample is used to
- A) stimulate differentiation in other mammoth cells
B) provide fragments to replace certain human body chemicals
C) act as a template for repeated replication
D) trigger mitosis to obtain new base sequences
14. Which cellular process involves DNA replication?
- A) **mitosis** B) cytokinesis
C) pinocytosis D) protein synthesis
15. Which event takes place first during DNA replication?
- A) A single-stranded RNA molecule is formed.
B) Transfer RNA links to an amino acid.
C) Free nucleotides are bonded together in the correct sequence.
D) The DNA molecule "unzips" along weak hydrogen bonds.

16. The process of mitosis usually involves

- A) chromosome duplication and synapsis
- B) DNA replication and separation of chromatids**
- C) tetrad formation and fertilization
- D) reduction in chromosome number and formation of a cell plate

Answer Key
DNA Structure review

1. **B**
 2. **B**
 3. **A**
 4. **D**
 5. **A**
 6. **D**
 7. **B**
 8. **A**
 9. **B**
 10. **D**
 11. **A**
 12. **C**
 13. **C**
 14. **A**
 15. **D**
 16. **B**
-