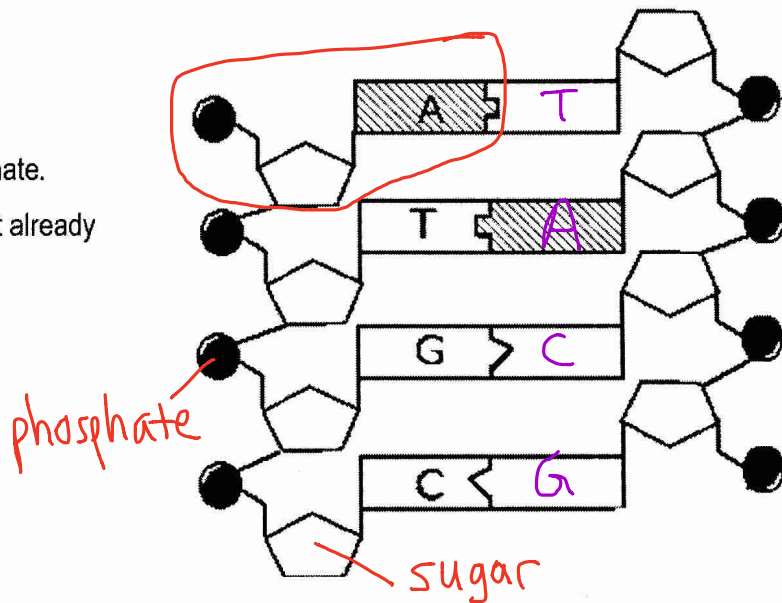


DNA Structure, DNA Replication, and Protein Synthesis Review

1. A nucleotide is made of three parts: a phosphate group, a five carbon sugar, and a nitrogen containing base.
2. In a single strand of DNA, the phosphate group binds to the sugar of the next group.
3. The 5' end of a single DNA strand contains a free _____, while the 3' end contains a free _____.
4. Purines have 2 rings, and pyrimidines have 1 ring.
5. Write out the complete name for DNA: Deoxyribonucleic acid

On the diagram:

- ~~Label the 3' and 5' ends.~~
- Circle a nucleotide.
- Label the sugar and phosphate.
- Label the bases that are not already labeled.



6. The two sides of the DNA helix are held together by hydrogen bonds.
7. The purines are adenine and guanine; the pyrimidines are thymine and cytosine.
8. The term used to describe how the two strands of DNA are oriented is antiparallel, which means one DNA strand is oriented upside down.
9. In a strand of DNA, the percentage of thymine is 30%. What is the percentage of cytosine? 20%.
Adenine? 30% Thymine? 20%

Sentence Arrange – Put the steps of DNA replication in order by writing a number in the space before each statement.

- 4 Two new molecules of DNA are created.
- 3 DNA polymerase attach the free-floating nucleotides to the exposed nitrogen bases.
- 1 Helicase begins to break the hydrogen bonds between nitrogen bases.
- 5 Cell starts into the mitosis phase of the cell cycle.
- 2 Free floating nucleotides pair up with exposed nitrogen bases.

DNA Replication

DIRECTIONS. Answer the following questions about DNA replication

1. Why does DNA replicate? *to make a copy of the DNA*

2. Is DNA replication describe as conservative or semi-conservative? Why?

Each copy of DNA has an original side and a new side

3. What 2 enzymes are used during DNA replication? Describe what each does during replication.

*Helicase - breaks the hydrogen bonds
DNA Polymerase - adds DNA nucleotides*

4. When does DNA replication occur in a cell? *before cell divides*

5. Where does DNA replication occur in a cell? nucleus

6. Show the complimentary base pairing that would occur in the replication of the short DNA molecule below. Use two different colored pencils (or different pens, markers, etc.) to show which strands are the original and which are newly synthesized.

Original DNA Strand 1	Original DNA Strand 2	→	Original DNA Strand 1 (copy from left)	New DNA Strand	+	New DNA Strand	Original DNA Strand 2 (copy from left)
A - T		→	A	T	+	A	T
C - G		→	C	G	+	C	G
T - A		→	T	A	+	T	A
T - A		→	T	A	+	T	A
A - T		→	A	T	+	A	T
C - G		→	C	G	+	C	G
G - C		→	G	C	+	G	C
C - G		→	C	G	+	C	G
C - G		→	C	G	+	C	G
G - C		→	G	C	+	G	C
A - T		→	A	T	+	A	T
T - A		→	T	A	+	T	A

Protein Synthesis Worksheet

Day: _____

Name: _____

Directions:

1. Use the DNA code to create your mRNA code.
2. Use the mRNA code to create your tRNA code.
3. Use the mRNA code and the Genetic Code to determine your amino acids.
4. Answer any questions by circling the correct underlined answer.

1.

DNA: T C C G C G C A G A G C T A G

mRNA: A G G C G C G U C U C G A U C

tRNA: U C C G C G C A G A G C U A G

Amino Acids: Arg Arg Val Ser Ile

2. mRNA is made during (transcription/translation).

3. mRNA is made in the (cytoplasm/nucleus).

4.

DNA: A C A A G A C G G T A C T G A

mRNA: U G U U C U G C C A U G A C U

tRNA: A C A A G A L G G U A C U G A

Amino Acids: Cys Ser Ala Met Thr