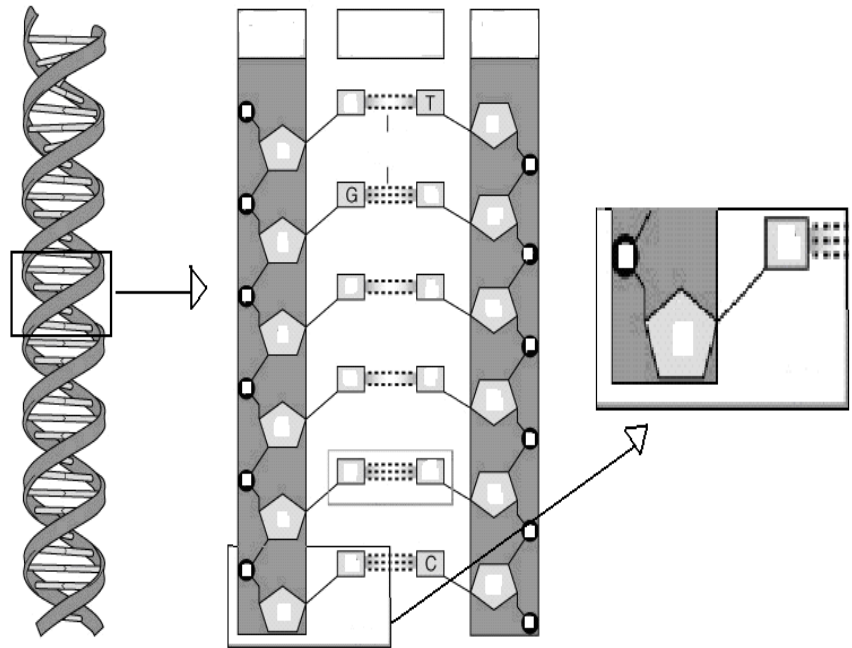


DNA: The Molecule of Heredity Worksheet

DNA Structure

1. On the diagram to the right:

- Circle and label a nucleotide.
- Label the sugar and phosphate molecules.
- Label the bases that are not already labeled.
- Label a base pair.
- Label the sugar-phosphate backbones.
- Label the hydrogen bonds.



2. A nucleotide is made of three parts: a _____ group, a five carbon _____, and a _____ base.
3. In a single strand of DNA, the phosphate group binds to the _____ of the next group.
4. Chargaff's rule states that the DNA of any species contains equal amounts of _____ & _____ and also equal amounts of _____ & _____.
5. In DNA, thymine is complementary to (or pairs with) _____ ; cytosine is complementary to _____.
6. In a strand of DNA, if the percentage of thymine is 30%, what would the percentage of cytosine in the same DNA strand be? _____.
7. James Watson and Francis Crick with, the help of Rosalind Franklin and others, determined that the shape of the DNA molecule was a _____.
8. Why do purines pair with pyrimidines? _____
9. What type of bonds connect the deoxyribose sugars to the phosphate groups?

10. What type of bonds connect the bases to each other? _____

DNA Replication

1. Number the steps of DNA replication in the correct order (1, 2, 3):

- _____ Daughter strands are formed using complementary base pairing.
 _____ DNA unwinds
 _____ The DNA of the daughter strands winds with together with its parent strand.

2. Why is DNA replication called “semi-conservative”? _____

3. What enzyme unwinds or unzips the parent strand? _____

4. What enzyme connects the new bases to the old bases in the DNA template?

5. What enzyme connects the new nucleotides together and proofreads them?

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		→			+		
C - G		→			+		
T - A		→			+		
T - A		→			+		
A - T		→			+		
C - G		→			+		
G - C		→			+		
C - G		→			+		
C - G		→			+		
G - C		→			+		
A - T		→			+		
T - A		→			+		