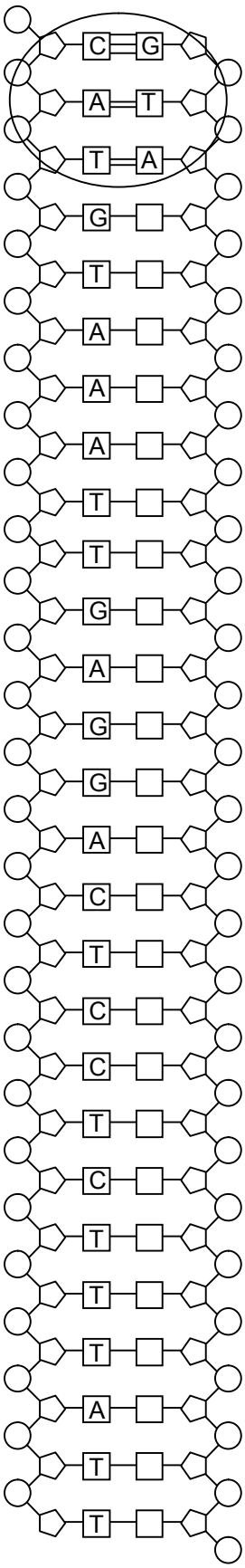
NAME _____ DATE _____ HOUR ____ **BIOLOGY**

DNA & RNA WORKSHEET



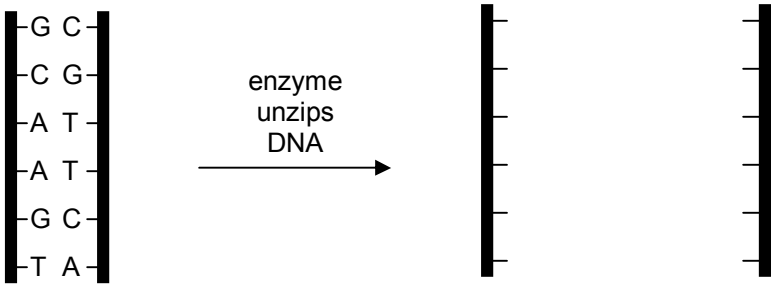
The diagram to the left is a representation of double-stranded DNA. There are 8 codons of the gene for hemoglobin on this segment of DNA. The 9th codon is a termination codon. This type of codon is found at the end of a gene.

DNA Structure

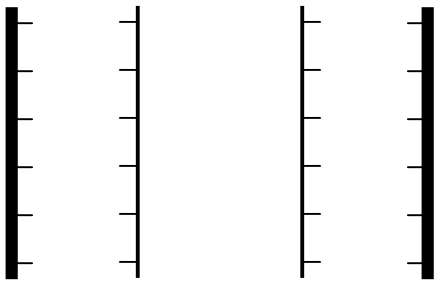
1. □ Fill in the complementary nitrogen bases on the right-hand side. (Check off the box when this step is complete.)
2. □ Fill in the correct number of bonds between the base pairs.
3. □ Circle the triplet codons, starting at the top.
4. What do the squares in the diagram represent? _____
5. What do the pentagons represent? _____
6. What do the outer circles represent? _____
7. How many bonds are there between:
   C & G? _____
   A & T? _____
   Why is the number of bonds important?

DNA Replication

8. What kind of bond "unzips" as replication starts? _____
9. Fill in the missing nitrogen bases in the gene segment that is replicating below:



10. What enzyme is necessary to "unzip" the molecule as shown above?
    _____
11. Fill in the new complementary nitrogen bases for the old template DNA strands:



12. What enzyme bonds the new nucleotides to their complementary bases during replication as shown above (that is, what enzyme zips the new DNA back together)? _____

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Transcription

13. What is transcription?

14. Starting at the top of your DNA on the previous page, transcribe the code into messenger RNA. Use the LEFT side of the DNA as your template. Circle the mRNA triplet codons.

_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

_____ _____ _____

The Genetic Code:

First letter	Second letter: U	Second letter: C	Second letter: A	Second letter: G	
U	UUU, UUC: Phenylalanine UUA, UUG: Leucine	UCU, UCC, UCA, UCG: Serine	UAU, UAC: Tyrosine UAA: Stop codon UAG: Stop codon	UGU, UGC: Cysteine UGA: Stop codon UGG: Tryptophan	U C A G
C	CUU, CUC, CUA, CUG: Leucine	CCU, CCC, CCA, CCG: Proline	CAU, CAC: Histidine CAA, CAG: Glutamine	CGU, CGC, CGA, CGG: Arginine	U C A G
A	AUU, AUC, AUA: Isoleucine AUG: Methionine; initiation codon	ACU, ACC, ACA, ACG: Threonine	AAU, AAC: Asparagine AAA, AAG: Lysine	AGU, AGC: Serine AGA, AGG: Arginine	U C A G
G	GUU, GUC, GUA, GUG: Valine	GCU, GCC, GCA, GCG: Alanine	GAU, GAC: Aspartic acid GAA, GAG: Glutamic acid	GGU, GGC, GGA, GGG: Glycine	U C A G