Name_____ period_____

Unit 4 Review

DNA

1. The primary function of DNA in cells is to...
   A. Serve as a storage for unused nucleotides
   B. Occupy space in the nucleus to keep it from collapsing
   C. Store information that tells the cell how to make certain proteins
   D. Serve as a template for making long carbohydrates and lipids

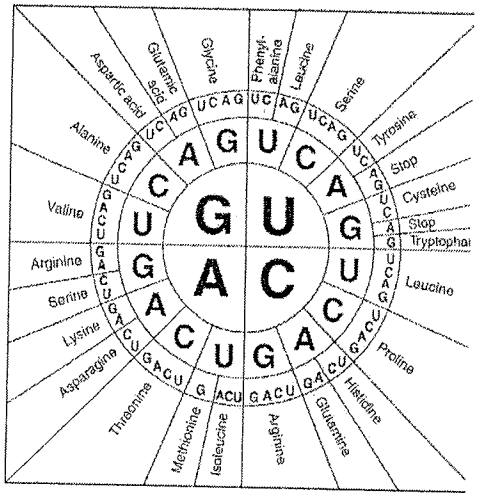
2. The two strands of a DNA molecule are held together by hydrogen bonds
   A. We mentioned that these need to be weak bonds. Why? to seperate strands for replication

3. What are Chargaff's base pairing rules? A-T C-G

4. What is the goal of DNA Replication? And **when** does DNA Replication happen?
   to make exact copies Nucleus during S phase of interphase before cell division

5. Every living organism has a genetic code called DNA. Differences between species come from a different order of nucleotides within that genetic code.

6. The basic building block for DNA is the nucleotide. Nucleotides are made up of....
   A. Phosphate, sugar, nitrogen base
   B. Phosphate, sugar, DNA polymerase
   C. Uracil, Adenine, Cytosine, Guanine
   D. Uracil, Adenine, Cytosine, Thymine



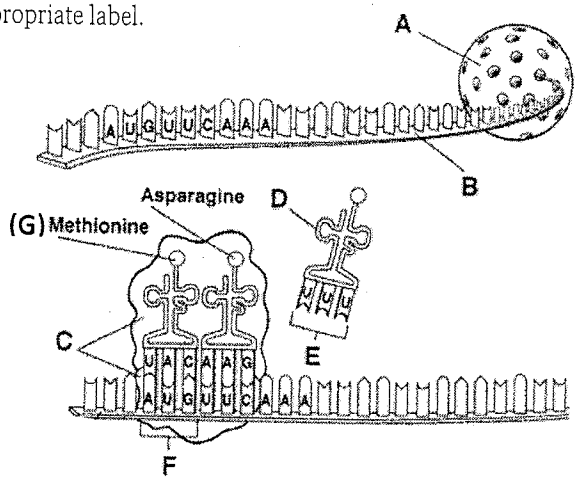
Transcription & Translation

7. Below are two mRNA strands. There have been multiple mutations in the bottom strand. Which amino acid will be affected in the resulting protein?_____

	Ala	Phe	Ser	Lys
Normal mRNA:	GCA	UUU	AGC	AAA
Mutated mRNA:	GCU	UUC	UCC	AAC
	Ala	1 Phe	2 Ser	3 Thr 4

8. Label the following pieces of this diagram and match #9- with the appropriate label.

A nucleus
B mRNA
C ribosome
D tRNA
E Anti-codon
F Codon
G Amino Acid



9. Using the picture to the right, where does ....
   A. transcription take place? A
   B. translation take place? C

Mutations

10. Give 2 examples of a "mutagen".

UV rays, radiation, cigarette smoke

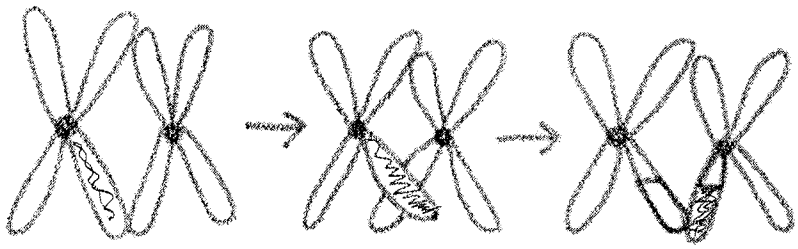
11. ***Circle*** which effects these mutations can have on a resulting protein... (could have multiple answers)

A.	Substitution:	no effect	affects one amino acid	affects all amino acids after that point
B.	Insertion:	no effect	affects one amino acid	affects all amino acids after that point
C.	Deletion:	no effect	affects one amino acid	affects all amino acids after that point

Cell Cycle

12. All cells come from pre-existing cells. ~~Mitosis~~ cell division is the process where a body cell divides to produce more body cells. If a 1 one body cell goes through 4 divisions, how many cells would you end up with?
    A. 4
    B. 8
    C. 16
    D. 32

13. Color code the following diagram to the right to best represent "crossing over"



    A. What does crossing over do?

14. Label each of the following as either "mitosis" or "meiosis".

Creates more body cells mitosis
Creates 2 genetically identical cells mitosis
Creates gametes meiosis
Makes haploid cells meiosis
Makes diploid cells mitosis
Helps you grow mitosis
Creates the "ingredients" for sexual reproduction to occur meiosis
Helps repair an open wound mitosis
Creates 4 genetically different cells meiosis

15. **Examine the following table. Calculate how many chromosomes the haploid gametes will have, or the diploid zygote.**

	Chicken	Human	Cow
# of chromosomes in zygote	78	46	60
# of chromosomes in gamete	39	23	30

16. Why do gametes need to be made haploid?

17. How are mutated cells, such as those in tumors, able to keep replicating? uncontrolled division

Gene Regulation

18. Gene regulation allows for cell differentiation to happen.

19. Describe what Hox genes do, and give an example of what happens if they mutate.

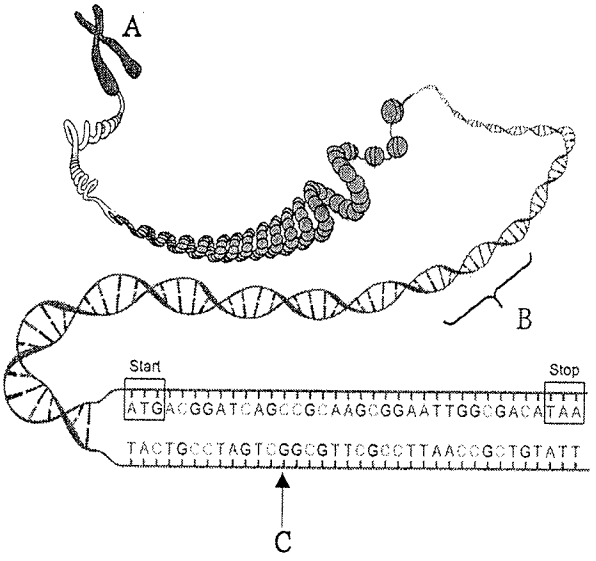
align body parts

20. Do lung cells and heart cells have the same DNA? If so, how are they doing different jobs?

yes - controlled by different segments of DNA

21. Label the following "levels" of genetic code. Use the word bank to the right.

A. Chromosome
B. Gene
C. nitrogen base



Word Bank

Gene
Nitrogen Base
Chromosome

22. Why is it beneficial to have DNA coiled into chromosomes?

to protect; to organize for replication

23. Identical twins share identical genomes. At age 40, will they still look completely identical?

No - environment

24. Is all of the DNA considered usable? Explain.

No some not "coded"