Honors Biology
End of Year Review!

Due by Thursday April 27/Friday April 28

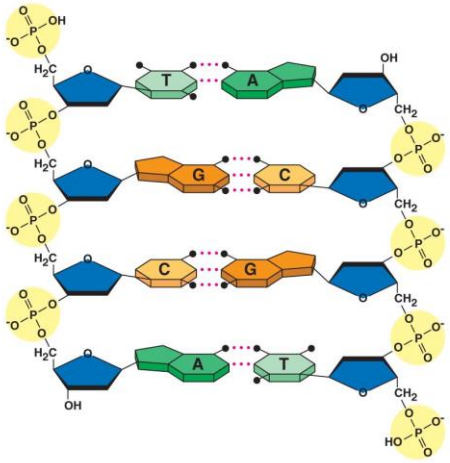
Name: _____ Period: _____

End of Year Review #2

Unit 4: Genetics

1. DNA is composed of _____ which are the most basic unit of DNA.
2. The three parts of a nucleotide are _____, _____, and _____.
3. The four nitrogen bases that are found in DNA are _____, _____, _____ and _____.
4. Two of the nitrogen bases are single ring structures known as _____.
5. The other two bases are double ring structures known as _____.
6. DNA looks like a ladder twisted into a shape known as a _____.
7. The sides of the DNA ladder are called _____.
8. The two molecules that make up the sides of the ladder or the side portion of a DNA molecule are _____ and _____.
9. The phosphate backbone of DNA is held together using _____ bonds, which are strong and not easily broken.
10. Which nitrogen bases always pair with one another?

11. The nitrogen bases are held together in the center of the molecule by _____.
12. The type of sugar found in DNA is _____.
13. Label the parts of the drawing below. Include all of these terms: nucleotide, phosphate, sugar, nitrogen base, hydrogen bond, covalent bond, purine, pyrimidine, adenine, thymine, cytosine, and guanine.



14. What is the primary function of DNA?

15. The process in which DNA builds an exact duplicate of itself is known as _____.
16. Why is it so important that the DNA molecule be able to make copies of itself? When would a cell need its DNA to replicate?

17. During replication, the two nucleotide chains _____ and each chain serves as a _____ for a new nucleotide chain. The site where DNA replication and separation occur is called _____.

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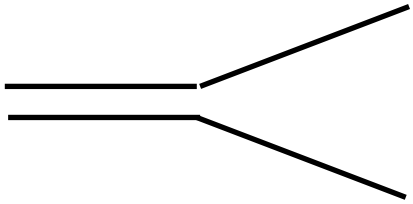
18. During replication, the enzyme _____ lays down new nucleotides on each template strand to create two new DNA strands. Finally, _____ "glues" the new nucleotides together.
19. In the space below, complete the diagram and label it to demonstrate your knowledge of DNA replication.



20. True or False? Each DNA molecule resulting from replication has one original strand and one new strand.
21. In RNA, adenine always pairs with the nitrogen base known as _____ instead of _____.
22. List three ways that DNA is different from RNA:
    a)
    b)
    c)
23. In the space below, diagram the Central Dogma of Genetics.
24. The process of making a strand of RNA from a strand of DNA is called _____.
25. _____ is the enzyme that synthesizes a new strand of mRNA from DNA.
26. The single section of DNA being transcribed is called a _____, which will make one protein
27. Transcription occurs in the _____ of the cell.
28. After transcription, the RNA strand leaves the _____ of the cell to the _____ of the cell where it will be "read" by a cell structure called a _____.
29. _____ is the process of reading a strand of RNA to create a strand of amino acids.
30. During translation, the RNA strand is read in 3-nucleotide "chunks" called _____, which code for one particular _____.
31. True or False? All amino acids are specified by only one codon.
32. Below is a chart of characteristics found in either DNA or RNA or both. Use check marks to indicate which are found in DNA and which are found in RNA.

Characteristic	Found in DNA	Found in RNA
Ribose present		
Deoxyribose present		
Phosphate present		
Adenine present		
Thymine present		
Uracil present		
Guanine present		
Cytosine present		
Double stranded		
Single stranded		
Remains in the nucleus		
Moves out of the nucleus		

33. During translation, a _____ reads the RNA code. Each codon on the RNA calls for one _____.
34. The ribosome connects _____ together to form a long polypeptide chain, which will result in a protein.
35. If the sequence on the DNA molecule calls for a protein with the following DNA codons, (1) what would be the sequence on the mRNA, (2) what would be the amino acid sequence of the protein being made?

    DNA: TAC TTA CAA ACC ATA ATT

    RNA:

    Amino Acids:

36. A change or mistake in the nucleotide sequence of DNA or RNA is called a _____.
37. True or False: A mutation will always cause a negative effect on a cell or organism.
38. Define each of the following mutations:
    a. Point
    b. Frameshift
        i. Insertion
        ii. Deletion
    c. Silent
    d. Nonsense

Unit 5: Patterns of Inheritance

Answer choices for questions 1-10:

A. Asexual Reproduction
B. Sexual Reproduction
C. Unisexual Reproduction
D. All of the above
E. None of the above

1. _____ Requires one parent cell
2. _____ Results in one genetically unique daughter cell
3. _____ Requires two parent cells
4. _____ It is advantageous because it results in genetically unique offspring cells
5. _____ Performed by large, complex, multi-cellular organisms
6. _____ Organisms that perform this form of reproduction are less likely to survive or adapt in a changing environment
7. _____ Results in two genetically identical daughter cells
8. _____ It is advantageous because it is a fast form of reproduction
9. _____ Organisms that perform this form of reproduction are more likely to survive & adapt in a changing environment
10. _____ Performed by single cells, single-celled organisms, or very simple organisms
11. Which of the following statements best describes the differences between meiosis and mitosis?
    A. Meiosis and mitosis both result in genetically unique cells but meiosis has two sets of phases and mitosis one.
    B. Meiosis and mitosis both have one set of phases but meiosis results in genetically unique cells.
    C. Meiosis and mitosis are both types of cell division, but meiosis results in genetically unique cells.
    D. Meiosis is an ancient form of cell division that no longer exists, but mitosis continues to occur.

12. Which of the following correctly BEST describes the result or outcome of Meiosis?
    A. Two genetically identical diploid gametes
    B. Four genetically identical diploid gametes
    C. Two genetically different haploid gametes
    D. Four genetically different haploid gametes
13. The purpose of Meiosis I is to separate _____, and the purpose of Meiosis II is to separate _____.
    A. Sister chromosomes, Homologous chromosomes
    B. One pair of sister chromosomes, Another pair of sister chromosomes
    C. Homologous chromosomes, Sister chromosomes
    D. Chromatin, Chromatids
14. The cells of Meiosis from a male and a female will undergo _____ in sexual reproduction to produce a _____ .
    A. Fusion, Digamete cell
    B. Fertilization, Somatic cell
    C. Meiosis, Gamete cell
    D. Fertilization, Zygote cell

For 16-19, match the statement with the correct cell division answer choice on the right. Each answer choice can be used more than once or not at all.

15. _____ Cross-over event occurs resulting in genetic variation.
16. _____ Genetically unique sister chromatids are separated in a haploid cell.
17. _____ Four genetically unique/different haploid gametes are created.
18. _____ Homologous chromatids are separated in a diploid cell.

Answer choices for 16-19:

A. Pre-Meiosis
B. Meiosis I
C. Meiosis II
D. Mitosis
E. None of the above

32. _____ Mixing/blotching of two dominant alleles, where dominant allele is lost
33. _____ A trait with three or more possible alleles for a genotype
34. _____ A trait found on the X or Y chromosomes
35. _____ A trait controlled by two or more genes or segments of DNA
36. _____ Blending of two dominant traits, neither allele shows up completely

Answer choices for 32-36:

F. Polygenic Trait
G. Monogenic Trait
H. Multiple Allele Trait
I. Codominance