

## DNA Structure & Replication

- I. Chromosome (Chapter 12-2 pg 295-297)
  - a. What is a chromosome
  - b. How many chromosomes are in one human body cell
  - c. How many chromosomes did an individual get from their mother? \_\_\_\_\_ their father? \_\_\_\_\_
  - d. How many chromosomes does a fruit fly have? \_\_\_\_\_
- II. Nucleic Acid Structure (Chapter 2-3 pg47 & 12-1 pg 291-294)
  - a. What is the smallest unit of a nucleic acid
    - i. What are the 3 parts of a nucleotide
    - ii. Draw a nucleotide
  - b. What are the two types of nucleic acid
    - i.
    - ii.
  - c. What does DNA stand for
  - d. What does RNA stand for
  - e. What are 3 differences between DNA and RNA

DNA	RNA
i.	i.
ii.	ii.
iii.	Iii.
  - f. List the 5 nitrogen bases
  - g. Explain the base pairing rule (DNA & RNA)
  - h. What is DNA's function in an organism
  - i. What is RNA's function in an organism
  - j. DNA is double helix, which means that DNA has...
  - k. What type of bond holds two nitrogen bases together
  - l. How are the 2 strands of DNA double helix related?
  - m. Define and show antiparallel
  - n. Draw a DNA ladder with 4 rungs (8 nucleotides)
  - o. Where is DNA found in the body
- III. DNA Replication (Chapter 12-2 pg 297-299)
  - a. Why is DNA replicated
  - b. When is DNA replicated
  - c. What makes DNA replication possible
  - d. Before DNA can be replicated helicase cause what 2 things to happen to the DNA strand?
  - e. Once the helicase unzips what is the next step?
  - f. What role does RNA polymerase play in DNA replication?
  - g. What role does DNA polymerase play in DNA replication?
  - h. Replicate the following DNA sequence. Show the old and new strands each step of the way  
5' ATCGGCAATACGTACCGATAACAGTACGGTATACATGACT3'  
3' TAGCCGTTATGCATGGCTATTGTCATGCCATATGTACTGA5'
  - i. The two stands of DNA will be what to each other?
  - j. Why is it important for DNA replication to create two identical DNA strands

Website Resources:

<http://www.pbs.org/wgbh/aso/tryit/dna/index.html#>

I. Protein synthesis (Chapter 12-3 pages 300-306)

- A. What is the smallest unit of a protein
- B. How many different amino acids are there
- C. What are some of the functions of proteins
- D. List the 3 types of RNA and what the function of each
- E. Identify the two steps of protein synthesis
- F. Where does transcription occur
- G. What happens to the DNA before transcription can occur
- H. How much of the DNA is opened for transcription
- I. What is the difference between the sense and nonsense strand of DNA
- J. What is made during transcription
- K. Why is mRNA edited before it leaves the nucleus
- L. How many letter for a codon
- M. What does a codon on mRNA code for
- N. How do you figure out what the code means on the codon
- O. On what organelles does translation occur, where can that organelle be found
- P. Translation forms what
- Q. What brings amino acids to the ribosome
- R. What does tRNA do after it drops off an amino acid
- S. What kind of bond forms between 2 amino acids
- T. Use the DNA code below to answer the following questions
  - 1. Sense strand
    - a. 5' TACGACATACGTTTCGGGGTGACAAC 3'
    - b. \_\_\_\_\_
- U. Create the nonsense strand of DNA directly below the sense strand
- V. Which strand will be used to make mRNA
- W. Write the mRNA sequence on the line below

a. \_\_\_\_\_

X. Write the tRNA sequence below

a. \_\_\_\_\_

Y. What will the amino acid sequence will be determined by DNA/ mRNA/ rRNA/ tRNA (circle one)

Z. Write out the complete amino acid sequence on the line below

a. \_\_\_\_\_

II. Mutations (Chapter 12-4 pages 307-308)

A. Gene Mutations

- 1. Gen mutations affect the \_\_\_\_\_.
- 2. A point mutation is when a base is \_\_\_\_\_. They only affect one \_\_\_\_\_.
- 3. Frame shift mutations is when a base is \_\_\_\_\_ or \_\_\_\_\_. This will affect all of the amino acids \_\_\_\_\_ the mutation.

B. Chromosomal Mutation is when the \_\_\_\_\_ is affected.

- 1. \_\_\_\_\_ is when a gene on the chromosome is removed.
- 2. \_\_\_\_\_ is when a gene on the chromosome moved to a different chromosome.
- 3. \_\_\_\_\_ is when a gene on the chromosome has two copies.
- 4. \_\_\_\_\_ is when a gene on the chromosome is moved to a new location.