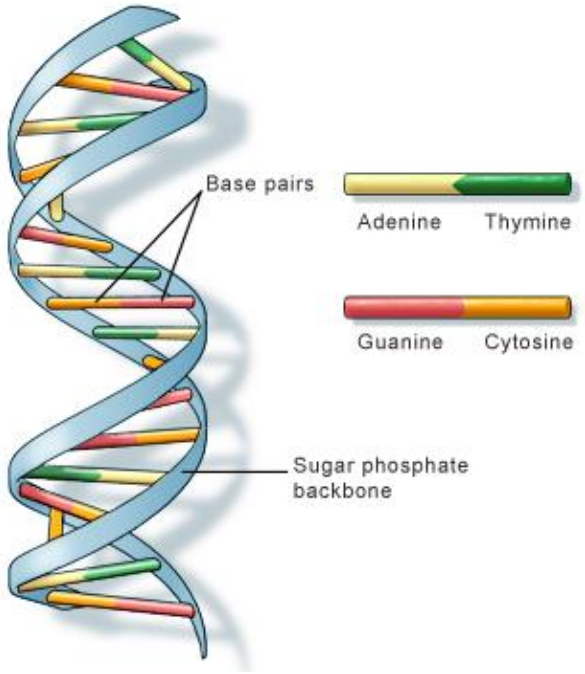
Name _____ Date _____ Period _____

Lab: DNA Modeling

BIOLOGY: Chapter 8

Introduction: The following activity will introduce students to DNA. DNA is a complex molecule that is found in all living organisms. The students will be able to manipulate the nucleotides (basic building blocks) of DNA and get a feel of how the molecule is produced.



Objectives:

- The students will learn the names of the four different nucleotides making up a DNA molecule
- Produce and replicate the DNA by following the proper steps.

Materials:

- Cut Outs of basic subunits of DNA
- Scissors
- Tape or glue.

Procedure:

1. Find a partner and cut out all of the units needed to make eight nucleotides from the handout provided. Cutouts include Nitrogenous bases (Adenine, Guanine, Thymine , Cytosine) phosphates and sugars, (deoxyribose).
2. Using the small squares and stars as guides, line up the bases, phosphates and sugars.
3. Now glue/tape the appropriate parts together forming nucleotides.
4. Construct DNA model using the following sequence to form a row from top to bottom:
    - Cytosine
    - Thymine
    - Guanine
    - Adenine
5. Let this arrangement represent the left half of your DNA molecule.
6. Complete the right side of the ladder by adding the complementary bases. You will have to turn them upside down in order to make them fit.
7. Your finished model should look like a ladder.
8. To show replication you will need to get with another pair of students to combine your nucleotides. Separate the left side from the right side, leaving a space of about 6-8 inches.
9. Use the other groups nucleotide, complete the molecule using the left side as the base.
10. Build a second DNA model by adding new nucleotides to the right half of the original piece of the molecule.
11. Tape the nucleotides together to form 2 complete DNA ladders.
12. Answer Conclusion questions when you are finished.

Conclusion Questions:

1. Of the 4 bases, which other base does adenine most closely resemble?

Why?

2. What three molecules make up a nucleotide?

3. List the 4 different nucleotides:

4. Which 2 molecules of a nucleotide form the sides (the backbone) of a DNA ladder?

5. What molecules form the “rungs” of the DNA ladder?

6. If 30% of a DNA molecule is Adenine, what percent is Cytosine?

What is this rule called?

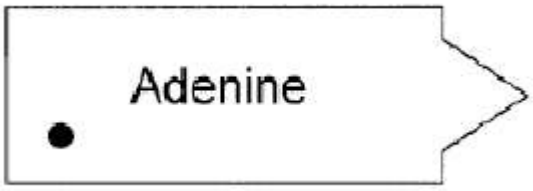
7. What does the term “complimentary” mean as it applies to DNA?

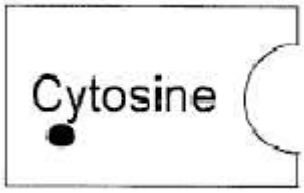
8. What does the term replication mean?

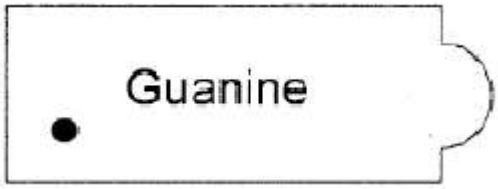
9. What does the term “helix” mean?

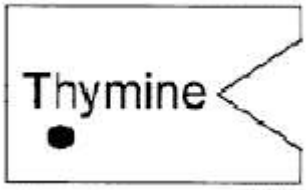
10. What scientists contributed to the discovery of the structure of the DNA molecule?

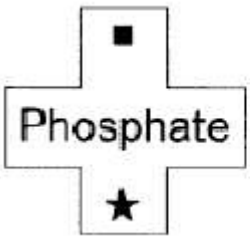
Directions: *Cut out the following DNA model pieces below. You will need to work with one partner to construct your DNA molecule*

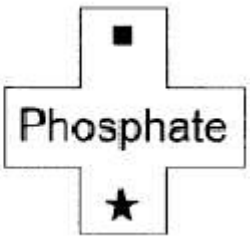


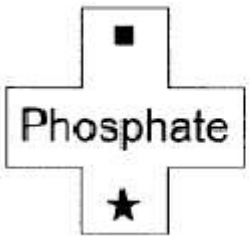


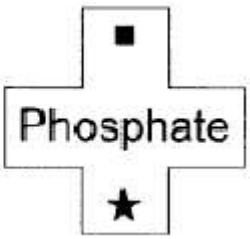












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