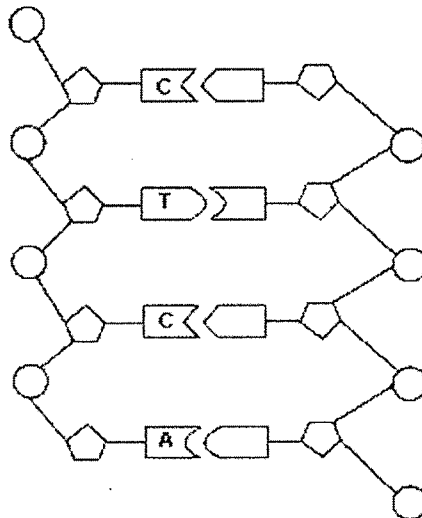


Lab: Modeling DNA Structure

Objective: To understand the structure and function of DNA

Directions: Each student group will construct a portion of a DNA molecule from 4 DNA nucleotides.

1. Cut the four nucleotides from your student handout.
 2. Examine the parts that make up each nucleotide.
 - 3a. How are the nucleotides similar?
b. How are the nucleotides different?
 4. Based on your observations, identify the three parts of a nucleotide.
 5. Each nucleotide resembles a puzzle piece. Solve the puzzle by fitting your nucleotides together in the proper order.
 5. Identify the areas where the nucleotides fit together.
 6. In nature, DNA molecules consist of thousands of pairs of nucleotides. Identify the pairing arrangement of nitrogenous bases adenine, (A), cytosine (C), thymine (T) and guanine (G).
 7. How many types of nucleotides are there? **Explain your answer.**
 8. Are there always equal numbers of nitrogenous bases in a DNA molecule? **Explain your answer.**
- DNA is made up two strands of nucleotides held together by weak hydrogen bonds between pairs of nitrogenous bases. When discussing a DNA model, scientists often refer to its structure as a "ladder".
9. Based on your observations, explain why you think DNA is ladder shaped. In your answer identify the following:
 - ✓ Which parts of the nucleotides form the rungs of the ladder?
 - ✓ Which parts of the nucleotides form the sides of the ladder?
 10. The following diagram illustrates a segment of a DNA molecule. Label all the missing parts of this molecule.



13. Color your nucleotide using the following color key:

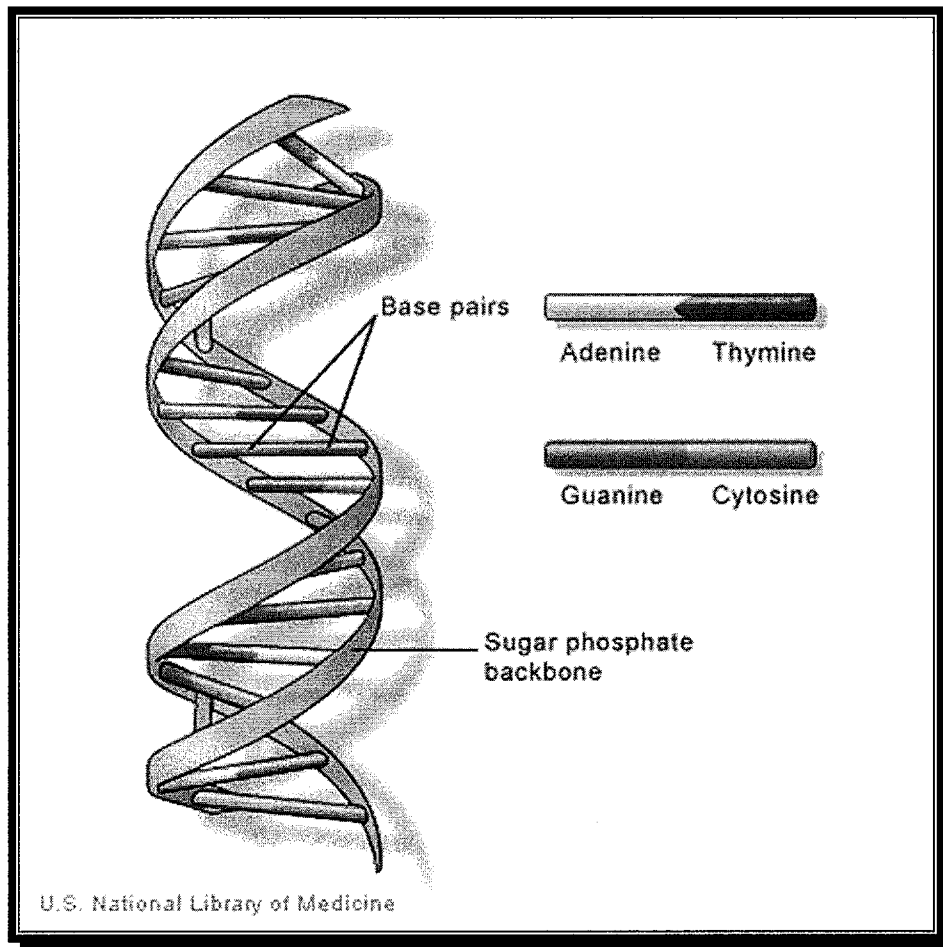
- Phosphates: yellow
- Deoxyribose: green
- Cytosine: purple
- Guanine: orange
- Adenine: red
- Thymine: blue

14. Tape your group's nucleotides together (remember A-T and G-C)

15. Join your nucleotide with the other units from your class to create one large DNA molecule.

Conclusions:

1. Identify 2 places where DNA can be found in the cell.
2. Describe the relationship among nucleotides, DNA, genes, chromosomes, and the nucleus of the cell.
3. Which part of the DNA molecule carries the genetic hereditary code? **Explain your answer.**
4. Define the term gene and, in general, describe the function of a gene.
5. Identify the group of organic compound that the genetic code instructs the cell to produce.



DNA Nucleotides

Color the nucleotides using the following key:

Deoxyribose = red

A (Adenine) = green

G (Guanine) = purple

Phosphate = blue

C (Cytosine) = yellow

T (Thymine) = orange

Cut out your nucleotides.

