

Mechanisms of Genetics

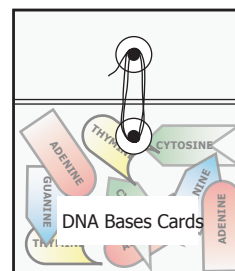
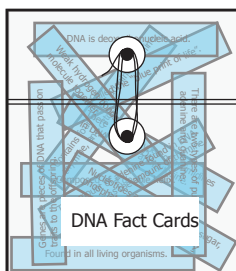
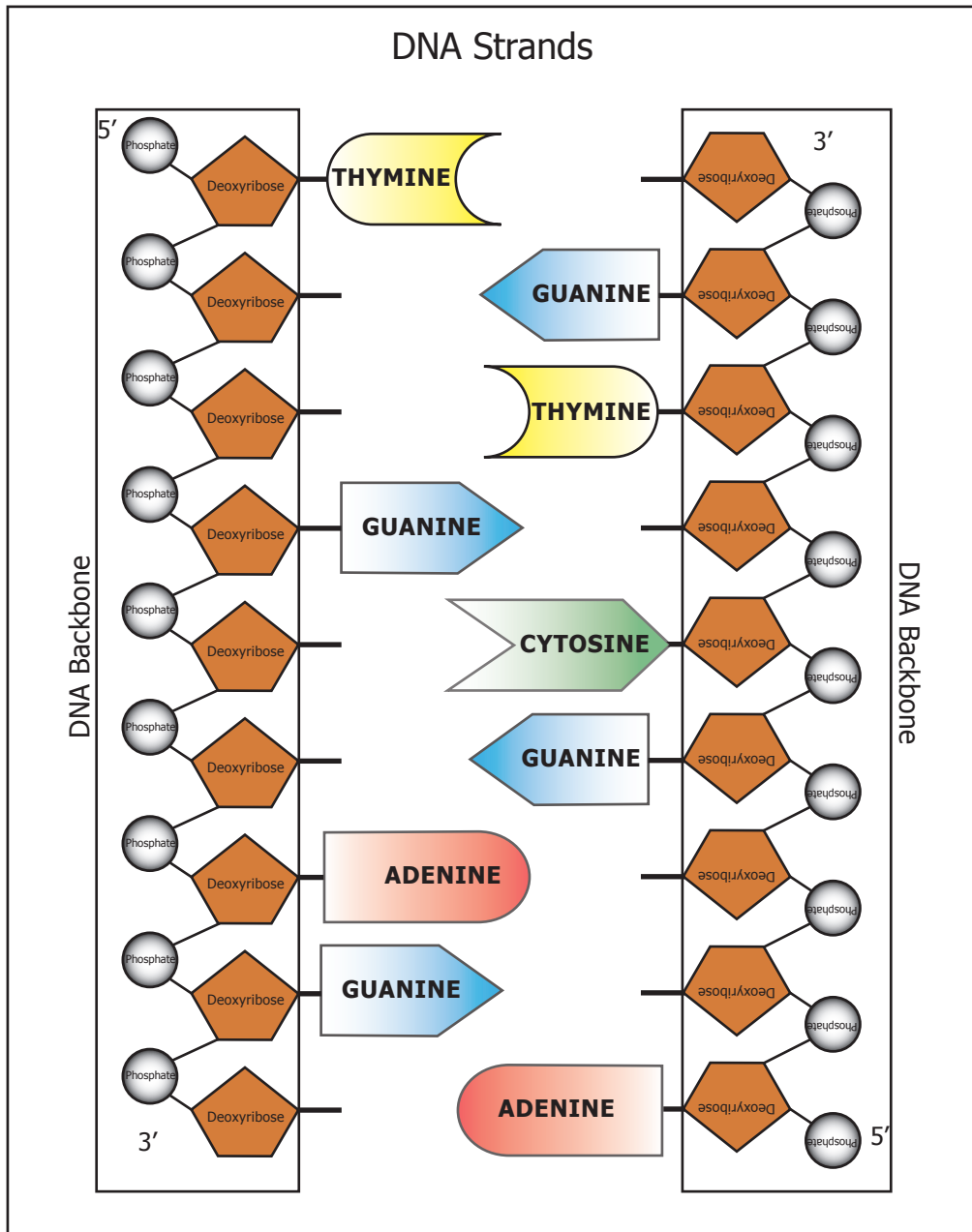
COMPONENTS OF DNA

Blackline Masters

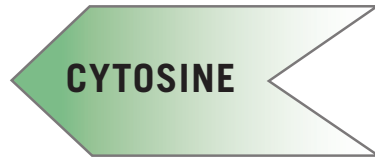
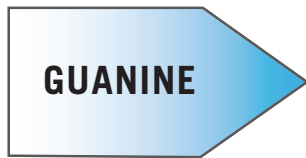
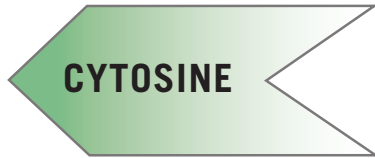
Contents

- Station Information sheet
- DNA Bases Cards
- DNA Strands sheet
- DNA Facts Cards
- Student Pages

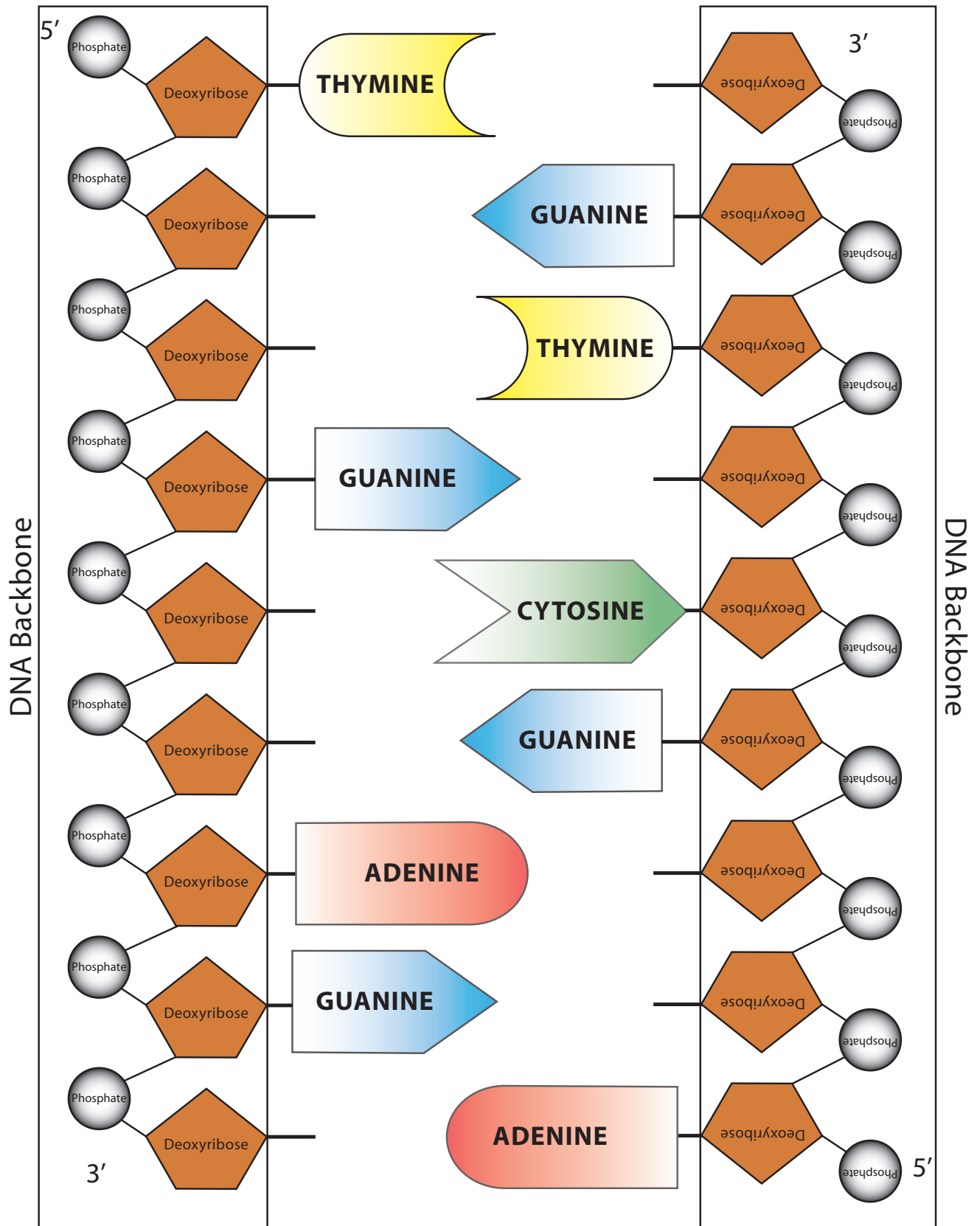
Station Information: Components of DNA



DNA Bases Cards



DNA Strands



DNA Fact Cards

Found in all living organisms.

Composed of a double helix.

Contains four bases: adenine, guanine, thymine, and cytosine.

The amount of adenine found in DNA is the same as the amount of thymine.

Weak hydrogen bonds hold the DNA molecule together.

Nucleotides are made up of a sugar, phosphate, and base, and a hydrogen bond.

Called the "blueprint of life."

Genes are pieces of DNA that pass traits to offspring.

There are two types of pyrimidines in DNA, thymine and cytosine.

There are two types of purines in DNA, adenine and guanine.

DNA is deoxyribonucleic acid.

Mechanisms of Genetics

COMPONENTS OF DNA

Student Pages**Purpose**

The purpose of this activity is to reinforce your understanding of the components of DNA.

Before You Begin

Check to see that all the items are present and organized according to the Station Information sheet. If you notice a problem, notify your teacher immediately.

Materials

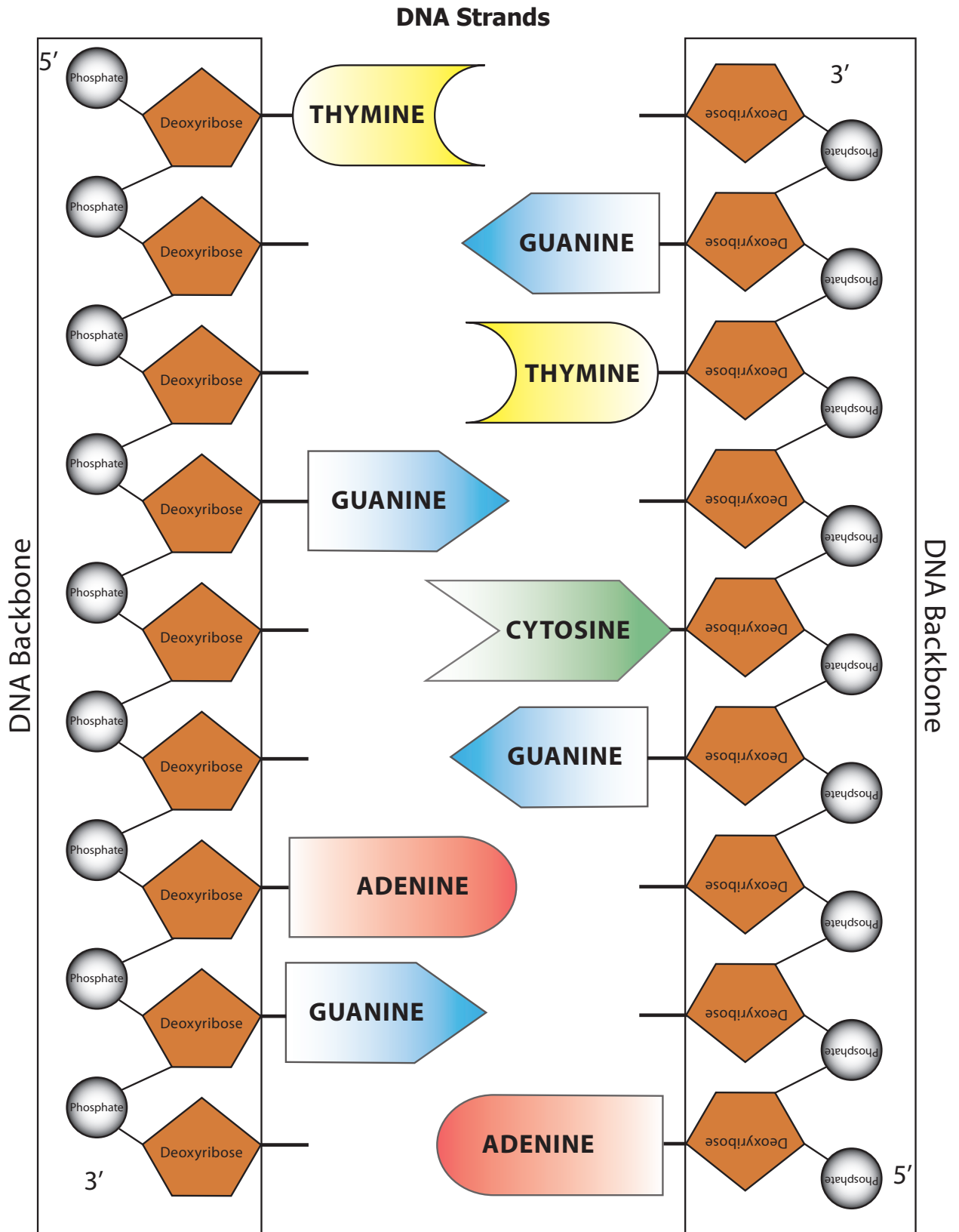
- Envelope containing DNA Bases Cards
- DNA Strands sheet (1 at the station)
- Envelope containing DNA Facts Cards

Activities and Questions***Essential Question***

How does the structure of DNA make it possible for traits to be passed on from one generation to another?

Discuss the essential question with your teammate(s) and record your answer below.

1. Locate the envelope containing the DNA Bases Cards. Use the cards to complete the DNA molecule on the DNA Strands sheet. Then record the information on the sheet below.

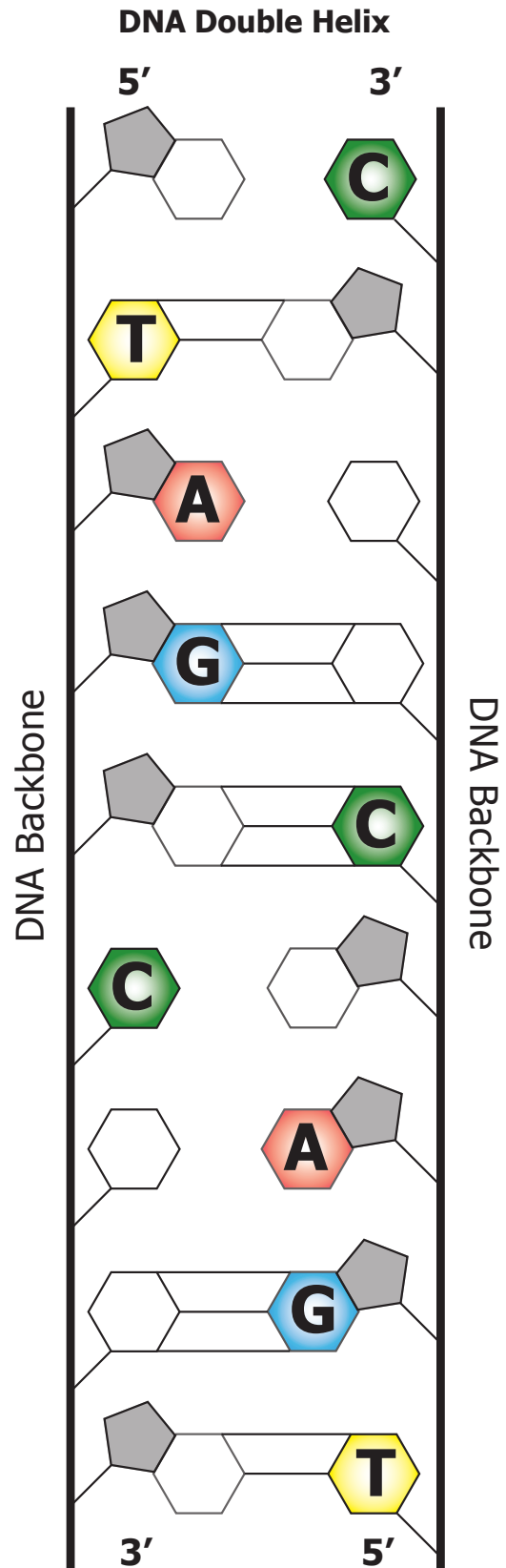
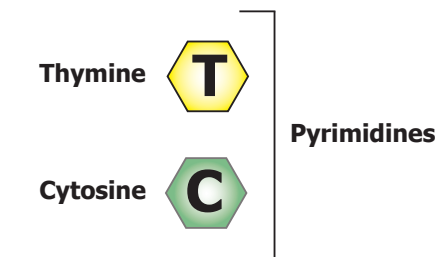
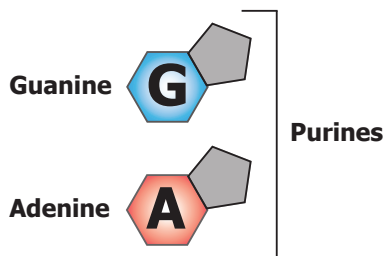
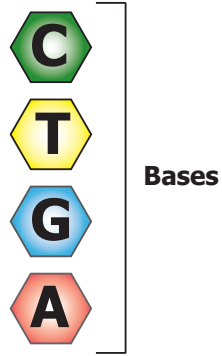


2. What are the components of a DNA molecule?

3. Take the DNA Facts Cards out of the envelope and sort them according to whether the fact is correct or not. Record the correct facts in the space below.

4. Fill in the DNA double helix. Include the complementary bases and hydrogen bonds. Use the legend to guide you.

Legend



I Need to Remember . . .

Complete this part **after** class discussion of this station.

I need to remember...

A large, empty rectangular box with a thin black border, intended for students to write their responses to the prompt 'I need to remember...'. The box is currently blank.

Glossary

Deoxyribonucleic acid

Deoxyribonucleic acid (DNA) is the large, double-stranded polymer inside a cell that carries the genetic information necessary for protein synthesis. Structurally, DNA looks like a long twisted ladder, with the sugar (deoxyribose) and phosphate groups forming the sides and complementary nucleotide bases forming each rung.

Hydrogen bonds

Hydrogen bonds provide the stability of the DNA double helix structure. The two strands of DNA are held together by the hydrogen bonds that join the complementary nucleotide base pairs. Two hydrogen bonds join the adenosine and thymine base pairs, and three pairs join the cytosine and the guanine.

Nucleotides

Nucleotides make up a nucleic acid. Nucleotides are composed of a 5-carbon sugar, a phosphate group, and a nitrogen base.

Nucleotide bases

Nucleotide bases are the organic molecules found in nucleic acids. The nucleotide bases in DNA are thymine, guanine, adenine, and cytosine; specific sequences of these bases code for specific proteins.

Purines

Purines are one of two building blocks of nucleic acids. There are two purines in DNA: adenine and guanine.

Pyrimidines

Pyrimidines represent the other building block of nucleic acids. There are two pyrimidines in DNA: cytosine and thymine. RNA contains a third pyrimidine called uracil.

5' and 3'

The 5' and 3' mean "five prime" and "three prime." These numbers indicate the carbon numbers in the DNA's backbone. The 5' carbon has a phosphate group attached to it, and the 3' carbon has a hydroxyl group. These notations indicate in which direction nucleotides are added to the backbone, going from 5' to 3'.