8.2 Structure of DNA

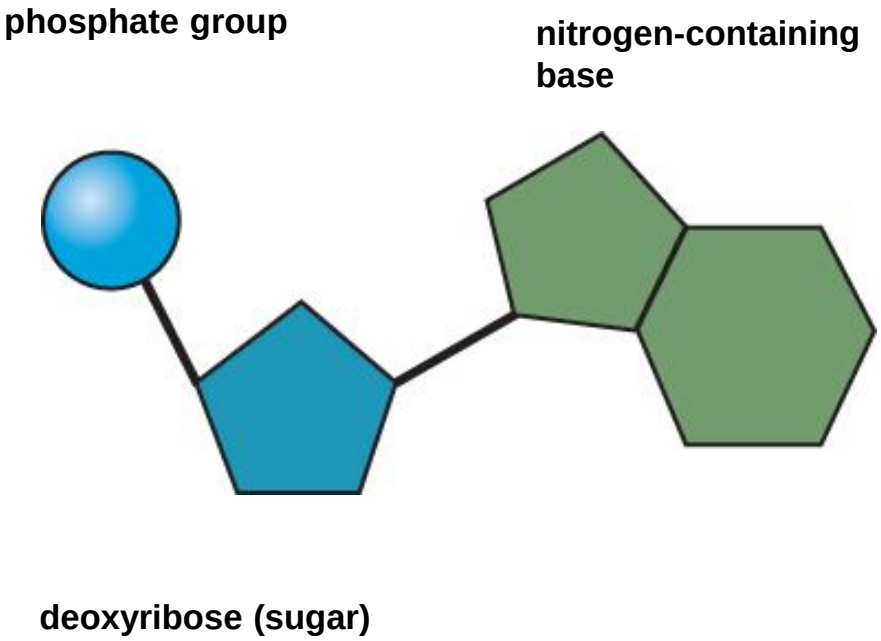
KEY CONCEPT

DNA structure is the same in all organisms.

8.2 Structure of DNA

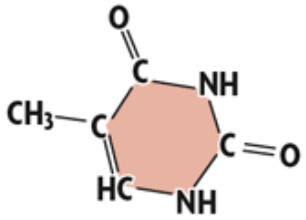
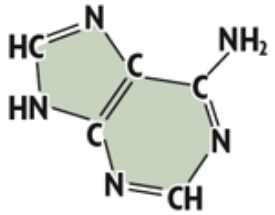
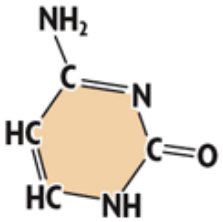
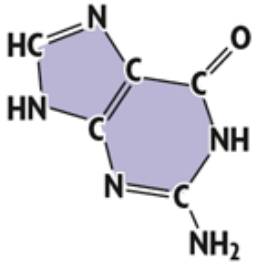
DNA is composed of four types of nucleotides.

- DNA is made up of a long chain of nucleotides.
- Each nucleotide has three parts.
  - a phosphate group
  - a deoxyribose sugar
  - a nitrogen-containing base



8.2 Structure of DNA

- The nitrogen containing bases are the only difference in the four nucleotides.

PYRIMIDINES = SINGLE RING			PURINES = DOUBLE RING		
Name of Base	Structural Formula	Model	Name of Base	Structural Formula	Model
thymine			adenine		
cytosine			guanine		

8.2 Structure of DNA

- **Watson and Crick determined the three-dimensional structure of DNA by building models.**
  - They realized that DNA is a double helix that is made up of a sugar-phosphate backbone on the outside with bases on the inside.

8.2 Structure of DNA

- Watson and Crick's discovery built on the work of Rosalind Franklin and Erwin Chargaff.
  - Franklin's x-ray images suggested that DNA was a double helix of even width.
  - Chargaff's rules stated that A=T and C=G.

8.2 Structure of DNA

Nucleotides always pair in the same way.

- The base-pairing rules show how nucleotides always pair up in DNA.
  - A pairs with T
  - C pairs with G
- Because a pyrimidine (single ring) pairs with a purine (double ring), the helix has a uniform width.

8.2 Structure of DNA

- The backbone is connected by covalent bonds.
- The bases are connected by hydrogen bonds.