

## CHAPTER OUTLINE

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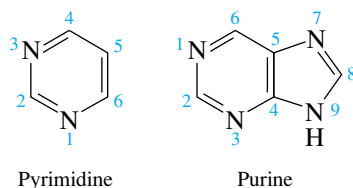
# CHAPTER 18

## NUCLEIC ACIDS

One of the major scientific achievements of the twentieth century was the identification, at the molecular level, of the chemical interactions involved in the transfer of genetic information and the control of protein biosynthesis. The substances involved are biological macromolecules called **nucleic acids**. We will conclude our look at biologically significant classes of organic compounds with a brief overview of these important molecules.

### 18.1 PYRIMIDINES AND PURINES

Nucleic acids were isolated over 100 years ago, and, as their name implies, they are acidic substances present in the nuclei of cells. There are two major kinds of nucleic acids: ribonucleic acid (RNA) and deoxyribonucleic acid (DNA). To understand the complex structure of nucleic acids, we first need to examine some simpler substances, nitrogen-containing aromatic heterocycles called **pyrimidines** and **purines**. The parent substance of each class and the numbering system used are shown:



The pyrimidines that occur in DNA are cytosine and thymine. Cytosine is also a structural unit in RNA, which, however, contains uracil instead of thymine. Other pyrimidine derivatives are sometimes present but in small amounts.

Recall that heterocyclic aromatic compounds were introduced in Section 6.15.