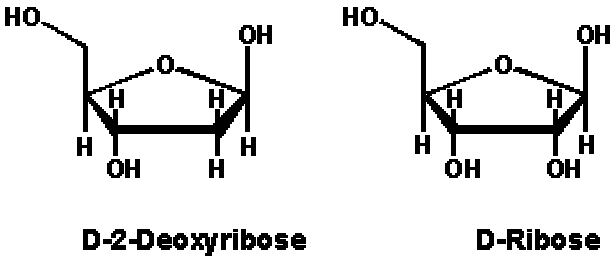
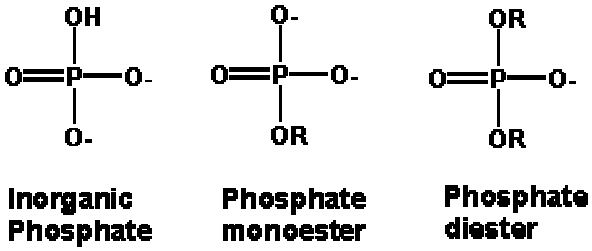
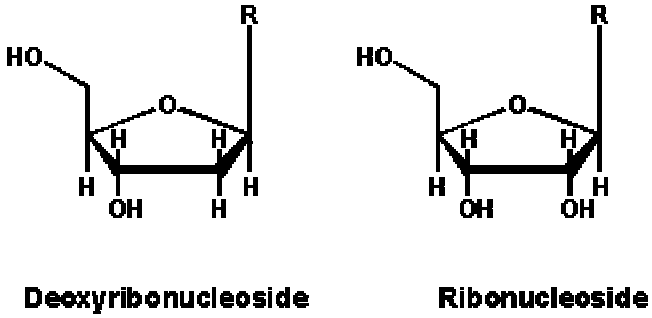
- Sugars.
  - DNA contains deoxyribose
  - RNA contains ribose



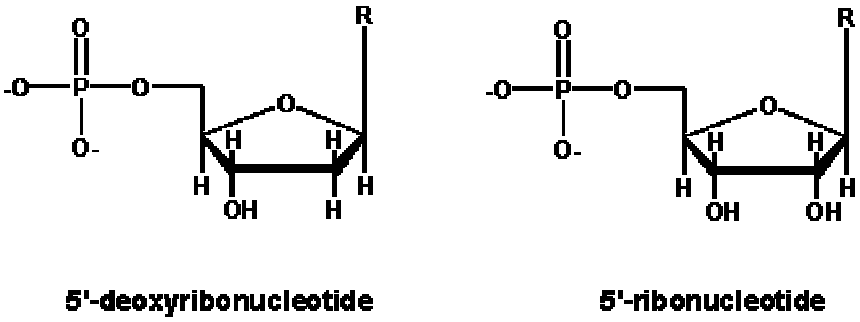
- Phosphate



- In DNA, the bases are linked by an N-1′-glycosidic bond to **2′ -deoxyribose** to form a **deoxynucleoside**.
- In RNA, the bases are linked by an N-1′-glycosidic bond to **ribose** to form a **nucleoside**.

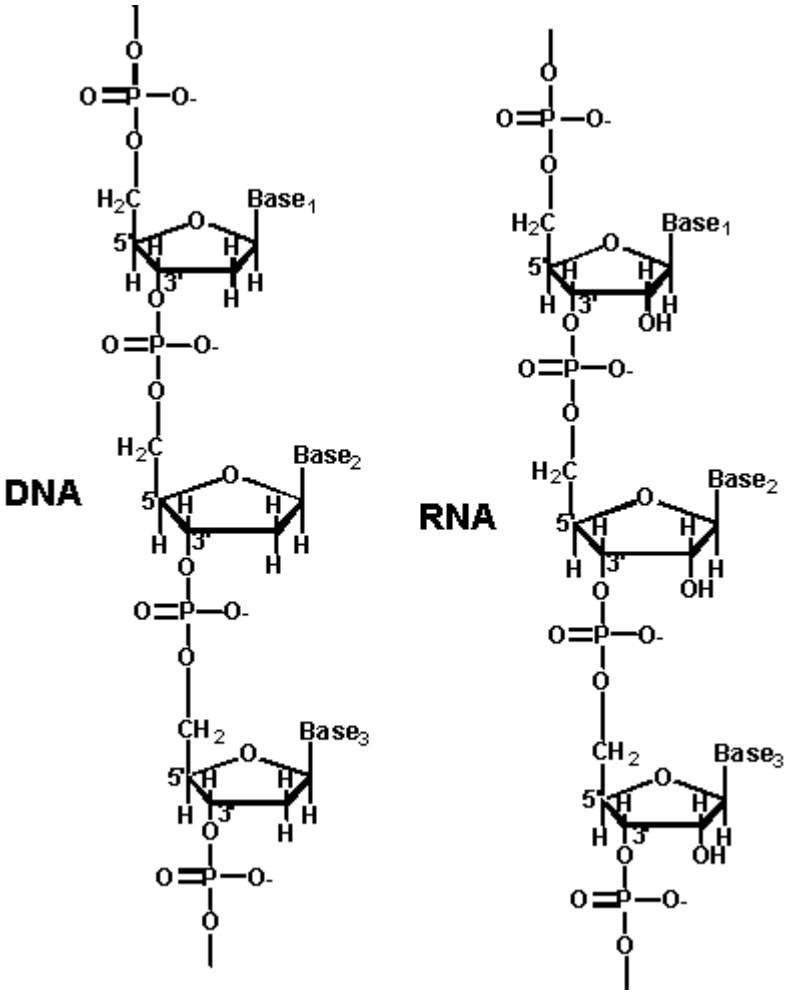


- **Deoxyribonucleotides** are **5′ -monophosphate ester** derivatives of deoxynucleosides.
- **Ribonucleotides** are **5′ -monophosphate ester** derivatives of nucleosides.



Nucleic Acids are Polymers of Nucleotide Phosphates

- The polymers, DNA or RNA, are formed by **phosphodiester bonds** between the 5′ hydroxyl of one nucleotide and the 3′ hydroxyl of the next.



- The nucleotides are strong acids: the two pK_as of the phosphomonoester are between 0.7 and 1.0 and between 6.1 and 6.3.
- Thus, in RNA and DNA the sugar phosphate backbone is negatively charged.
- The bases all absorb light strongly in the near ultraviolet (~ 260 nm).
- The phosphodiester bonds in nucleic acids are thermodynamically unstable (ΔG for hydrolysis is about -25 kJ/mol), but in the absence of a catalyst (enzyme) the polymers are quite stable.