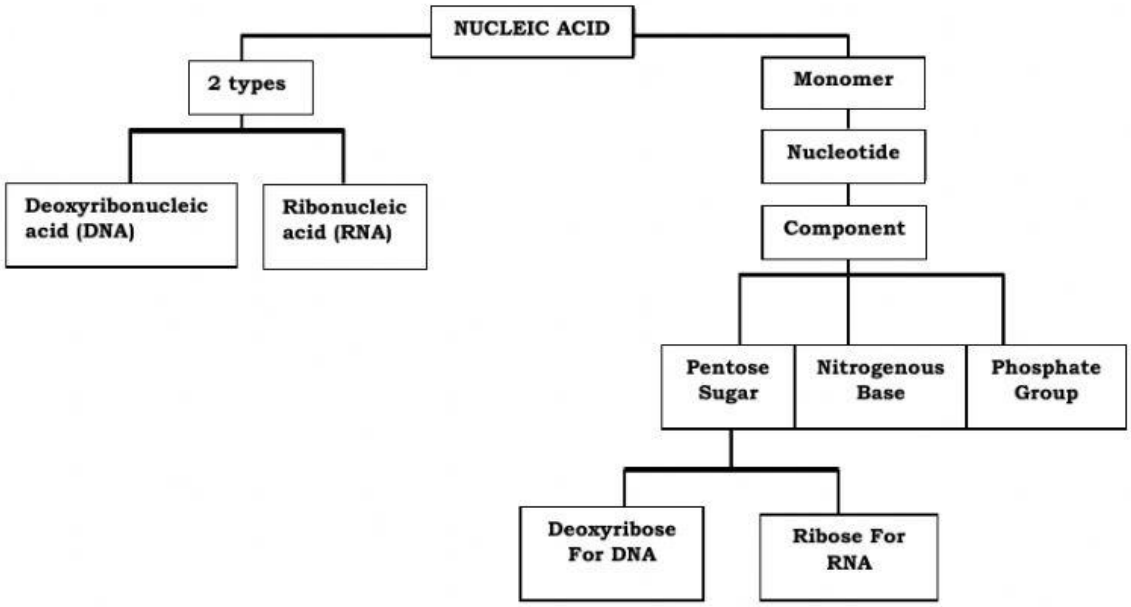
## 1.5 DNA AND RNA MOLECULES

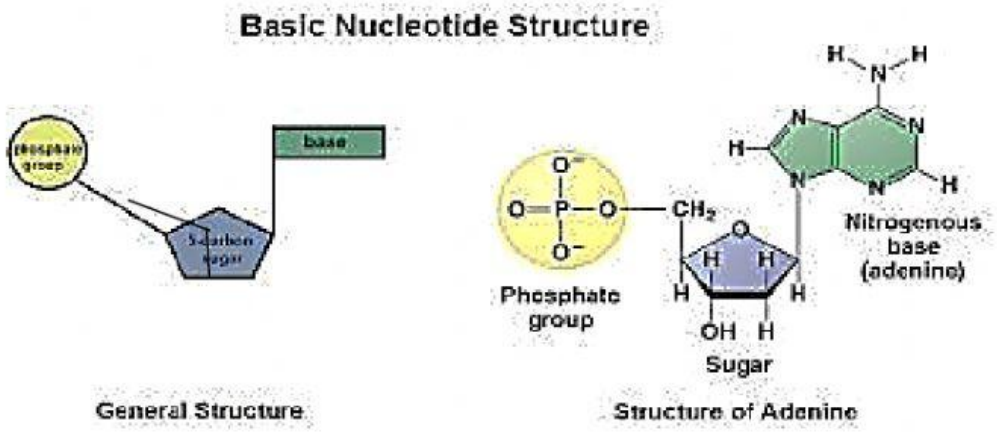
Learning outcome
At the end of the lessons, students should be able to:

a) State the structure of nucleotide as the basic composition of nucleic acids (deoxyribonucleic acid, DNA and ribonucleic acid, RNA).
b) Differentiate between RNA and DNA nucleotide.
c) Describe the structure of DNA based on the Watson and Crick Model.




### a) State the structure of nucleotide as the basic composition of nucleic acids (deoxyribonucleic acid, DNA and ribonucleic acid, RNA).

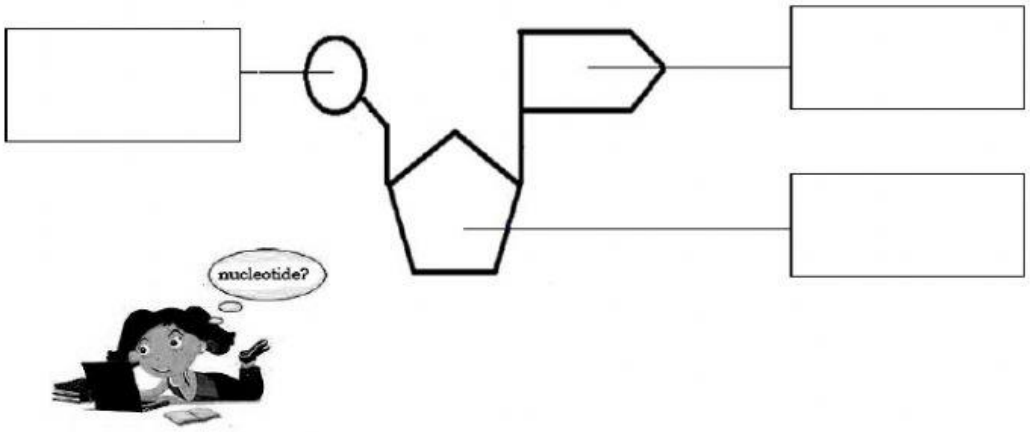
- There are two types of nucleic acid: _____(DNA) and _____(RNA).



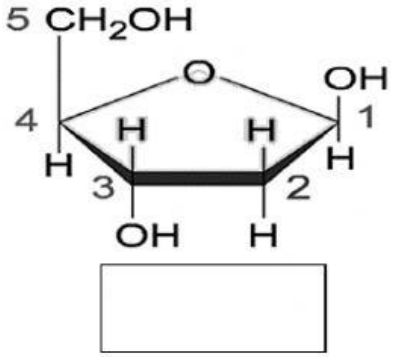

LIVEWORKSHEETS
LIVEWORKSHEETS

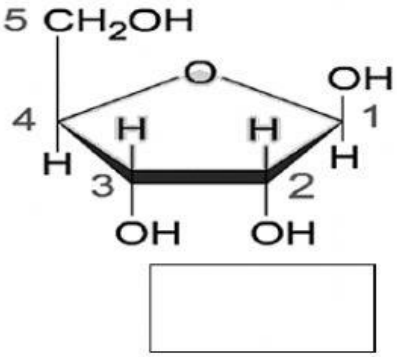
- Monomer for nucleic acid is _____.
  - It is made of three components: _____ sugar, _____ base and _____ group.
- In a nucleotide, _____ is attached to the carbon number one of pentose sugar while _____ is joined to the carbon number five of pentose sugar.
- Pentose sugar of DNA is known as _____ sugar while for RNA known as _____ sugar.
- There are two types of nitrogenous base which are _____ and _____.
- Purine consist of Adenine and _____ base
- Pyrimidine consist of Cytosine, _____ and Uracil.

**Exercise 1.5 (a):** Identify each component of the nucleotide below.



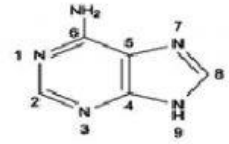
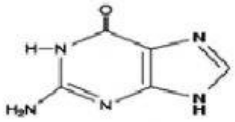
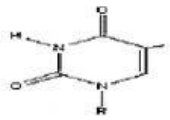
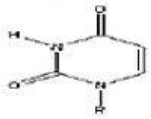

**Exercise 1.5 (b):** Name and circle the difference between the two different types of pentose sugars shown in figure below.




LIVEWORKSHEETS LIVEWORKSHEETS

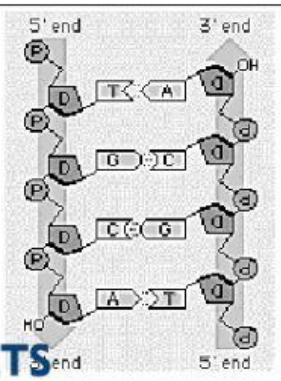
**Types of nitrogenous base:**

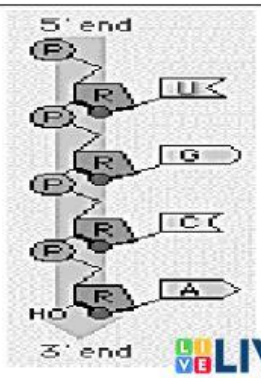
| _____??? | _____??? |
|---|---|
| • _____ **rings**<br><br>Adenine<br><br>Guanine | • _____ **ring**<br> Thymine<br> Cytosine<br> Uracil |

b) Differentiate between RNA and DNA nucleotide.

**Exercise 1.5 (c):** List all the differences between DNA dan RNA.

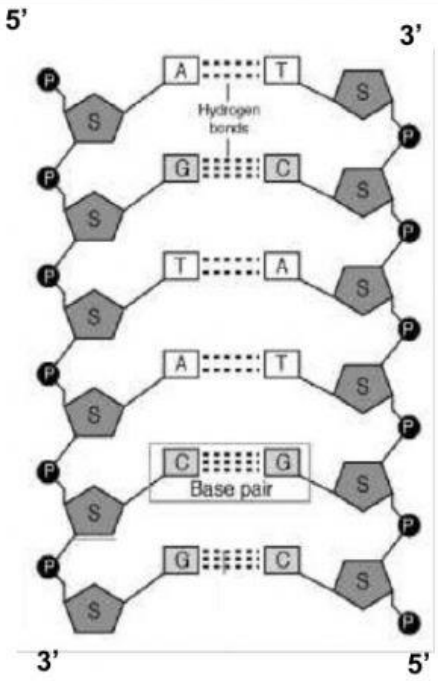
| DNA | RNA |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |




LIVEWORKSHEETS LIVEWORKSHEETS

c) Describe the structure of DNA based on the Watson and Crick Model.

| Stucture | Characteristics (Features) |
|---|---|
| <br>**Functions of nucleic acids:**<br>1. Storage of genetic information (DNA)<br>2. Transmit genetic information from generation to generation (DNA)<br>3. Self-replication (DNA)<br>4. Transmit genetic information for cell use (RNA) | • Consist of _____ polynucleotide strands<br>• The 2 strands are _____ and coiled in a spiral forming _____ _____ structure.<br>• The pentose sugar in its nucleotide is _____ sugar.<br>• The nucleotides in each strands are joined by _____ bond (between its phosphate group of one nucleotide and carbon number five of pentose sugar of another nucleotide), forming _____ backbone.<br>• The two strands are anti-parallel and must be complementary to each other.<br>• Involve pairing of four organic bases: _____ ,Guanine (G), Thymine (T), _____.<br>• The organic bases are paired and linked by _____ bond.<br>• Adenine must pair with _____ with _____ hydrogen bonds.<br>• Guanine must pair with _____ with _____ hydrogen bonds.<br>• Chargaff's rules (base pairing rules):<br>i. Pairing of bases must be between purine and _____<br>ii. The ratio of (G+C) to (A+T) is different for each species. |

LIVEWORKSHEETS LIVEWORKSHEETS