

## Lesson plan

Class 12<sup>th</sup>

Subject – Biology

Duration- 40-45 min

Topic the structure of DNA

### Learning outcomes

- 1.The student should know the components of DNA
- 2.The student should know the types of bonds for linkage in the components
- 3.Students should know the helical arrangement of nucleotides
- 4.Students should know the anti parallel nature of the two helices

### Learning objectives

Students will be told about:

1. The types of sugars on the basis of structure and number of carbon atoms
- 2.Difference between ribose and deoxyribose sugar
- 3.Formation of glycosidic and ester bonds
4. The linkage between the different components of nucleotides and attachment of nucleotides with each other to form helix

Complementary nature of the two helices

### Engage

From Mendel's experiments students know the tall plants produced tall plants ,now the students are asked to list similarities and differences between them and their parents

Students know the linkage between the two generations is through gametes so they are asked to predict the similarities in the gametes

## Explore

1. Why do you resemble your parents?
2. Which component of gametes is the cause of resemblance?
3. What is the composition of this component?

Announcement of the topic

After creating the interest among the students, the teacher will announce that we will discuss the structure of the molecule which is responsible for similarity between the parents and the offspring, i.e. **DNA**

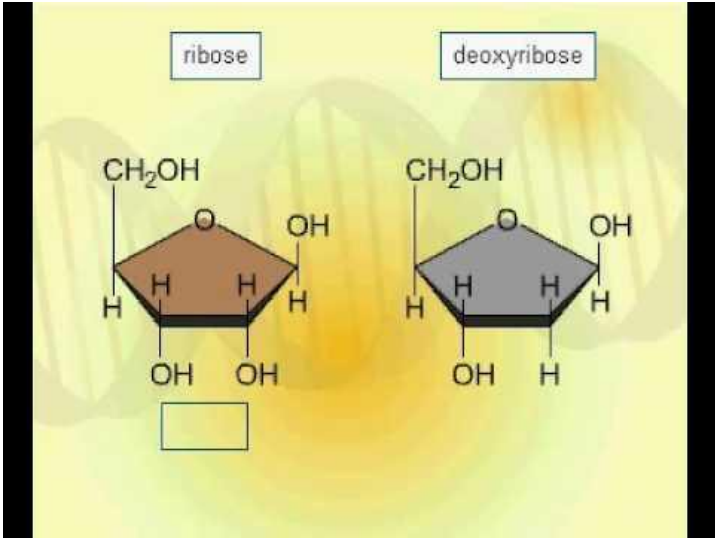
Learning Resources: Chalkboard, coloured chalk, smart board, pointer

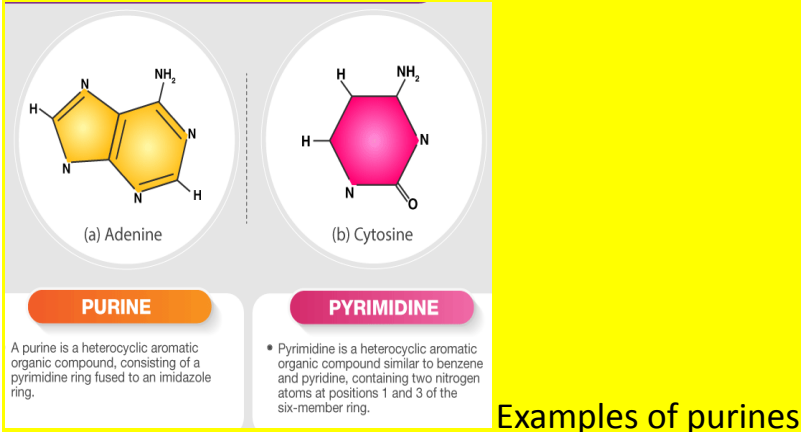
Chart of DNA showing Watson and Crick model of DNA

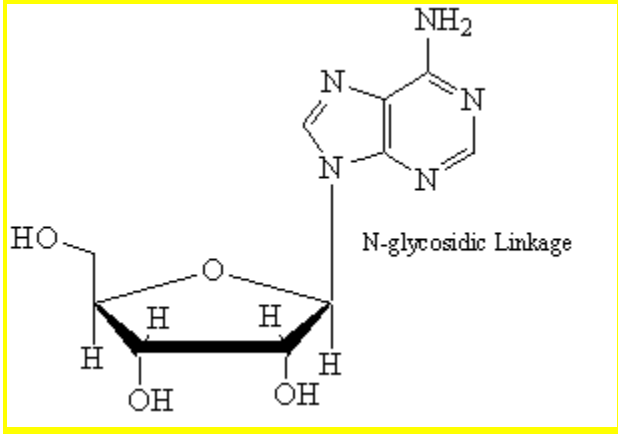
model of DNA

Announcement of topic: Finding the fact that students are not knowing the components of DNA, the teacher will start the topic "Structure of DNA" **Explanation**

Teaching point	Presentation on Chalk board	Student's activity
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<p>Introduction of pentose sugar</p>		<p>Students will draw the structure and observe the difference between the two types of sugar</p>
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<p>Types of nitrogenous bases</p>	 <p>Examples of purines: Adenine, Guanine</p> <p>Pyrimidines: Thymine, Cytosine</p>	<p>Observe the structure and write the names of the nitrogenous bases</p>
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<p>Linkage between sugar and nitrogenous base and type of bond between sugar and</p>		<p>Students will observe the linkage and draw the structure</p>
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nitrogenous base		
Attachment of phosphoric acid to nucleoside (Nitrogenous base plus sugar)	<div style="border: 2px solid yellow; padding: 10px; text-align: center;"> <p>Nucleotides (Guanine Nucleotide)</p> <p>Phosphate molecule + Deoxyribose (Sugar) + Nitrogenous (Guanine Base) = Nucleotide (Guanine Nucleotide)</p> </div>	Students will draw the structure of basic unit of DNA (Nucleotide)

Attachment of nucleotides		Students will observe the linkage and draw the structure
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Explanation of Antiparallel nature of the two helices with different types of bonds	<p>A list of bonds found in biological molecules is provided. Which of these bonds is found between adjacent nucleotides in a DNA double helix?</p> <ol style="list-style-type: none"> <li>1. Hydrogen</li> <li>2. Peptide</li> <li>3. Phosphodiester</li> <li>4. Ionic</li> <li>5. Glycosidic</li> </ol> <div style="display: flex; align-items: center;"> <div style="border: 1px solid green; padding: 2px; margin-right: 20px;">phosphodiester bond</div> </div>	Students will observe and draw the diagram
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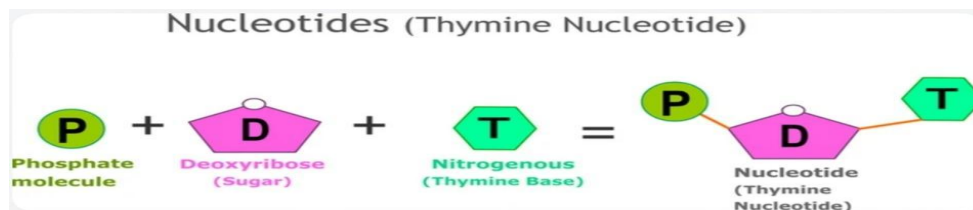
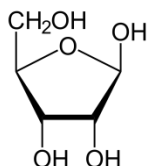
**Elaboration**

After going through the structural details of DNA ,teacher will give additional information on types of DNA on the basis of structure i.e A,B,C,D, and Z form of DNA

Teaching point	Chalk board work	Student' activity
B DNA	Most common type of DNA,10 Base pairs per helix and stable	Note down the information
A DNA	Unstable,12 base pairs per helix	Will note the content
C DNA	Unstable 9.33 base pairs	Will note it
D DNA	Unstable 8 base pairs per helix	Listen carefully and note
ZDNA	Unstable 12 base pairs per helix	Will note
Comparison between different types of DNA		Student's will tabulate the differences

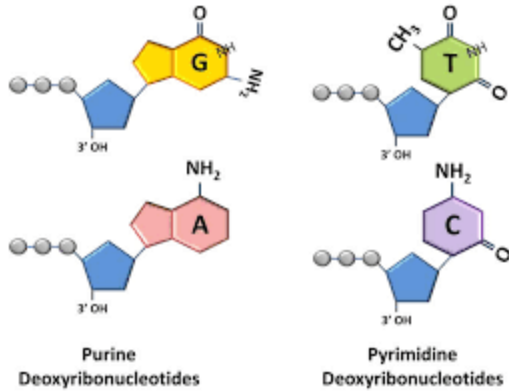
### Evaluation

name the sugar in figure



Which type of base is depicted in the nucleotide ,purine or pyrimidine

Name the bond between sugar and nitrogen base



Find out double membered nitrogen bases

Recaptulation: After discussing the detailed following points should berevised

- 1 .Sugar present in DNA Deoxyribose having five carbons
2. The different types of bonds between the components in DNA are Hydrogen bond, Glycosidic bond ,ester bond
- 3.The two helices are antiparallel
- 4.There are varieties of DNA depending on different features

Homework

Draw labelled diagram of Watson and Crick Model of DNA

Write difference between purines and pyrimidines