Chapter-wise Instructional Objectives

### Nutrition
Learners will be able to

- Define the term Life Processes.
- Recognize the various forms of Life Processes.
- Recall the term Nutrition.
- Define the term Nutrition.
- Recall the types of Nutrition in Plants.
- Recognize the different types of Nutrition in Plants.
- Explain the different types of Nutrition in Plants.
- Cite examples of Autotrophic and Heterotrophic nutrition.
- Recall the term Photosynthesis.
- Recognize the conditions necessary for Photosynthesis.
- Identify the raw materials for Photosynthesis.
  - Explain the structure and working of Stomata.
  - Draw a well labeled diagram of structure of leaf to show chloroplast in it.
- Perform the experiment related to conditions necessary for photosynthesis.
- Recall the different types of Nutrition in Animals.
- Recognize the different types of Nutrition in Animals.
- Explain the different types of Nutrition in Animals.
- Cite examples of Herbivores, Carnivores and Omnivores.
- Identify the steps in the process of Nutrition in Animals.
- Explain the steps in the process of Nutrition in Animals.
- Recognize the steps in nutrition of Amoeba.
- Explain the stages in nutrition of Amoeba.
- Draw a well labeled diagram of different stages in nutrition of Amoeba.
- Explain the process of nutrition in Paramecium.
- Recall the different steps of nutrition in Human Beings
- Recognize the different steps of nutrition in Human Beings.
- Explain the different steps of nutrition in Human Beings.
- Analyze the functions of different digestive organs in Human Digestive System.
- Differentiate between functions of different digestive organs in Human Digestive System.
- Draw a well labeled diagram of Human Digestive System.
- Recall the term Dental Caries.
- Recognize the term Dental Caries
- Explain the mechanism of Dental Caries.
- Identify the precautions taken to prevent Dental Caries.
- Draw a well labeled diagram of parts of a Tooth.
- Discriminate and distinguish between Nutrition in Plants and Animals.
- Accept the significance of nutrition in plants and animals in Biological processes.
- Develop their keen interest in knowing about the types and functions of Nutrition in Plants and Animals.
<table>
<thead>
<tr>
<th>Respiration</th>
<th>Learners will be able to</th>
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<tbody>
<tr>
<td></td>
<td>• Recall the term Respiration.</td>
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<td></td>
<td>• Recognize the term Respiration.</td>
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<tr>
<td></td>
<td>• Define the term Respiration.</td>
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<tr>
<td></td>
<td>• Recall the term Breathing.</td>
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<td>• Recognize the term Breathing.</td>
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<td></td>
<td>• Define the term Breathing.</td>
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<tr>
<td></td>
<td>• Recall the types of Respiration.</td>
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<td></td>
<td>• Recognize the different types of Respiration.</td>
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<td></td>
<td>• Explain the different types of Respiration.</td>
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<tr>
<td></td>
<td>• Cite examples of Aerobic and Anaerobic Respiration.</td>
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<tr>
<td></td>
<td>• Differentiate between Aerobic and Anaerobic Respiration.</td>
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<tr>
<td></td>
<td>• Distinguish between Cellular Respiration and Breathing.</td>
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<tr>
<td></td>
<td>• Explain the process of respiration in plants.</td>
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<td></td>
<td>• Analyze the steps of Glycolysis and Kreb’s Cycle in respiration.</td>
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<td></td>
<td>• Explain the mechanism of Electron Transport System.</td>
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<td></td>
<td>• See interrelationships between different Metabolic Pathways.</td>
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<td></td>
<td>• Discuss the mechanism of Respiration in Fish.</td>
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<td></td>
<td>• Draw a well labeled diagram of structure of a Gill.</td>
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<td></td>
<td>• Recall the steps of respiration in Human Beings.</td>
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<tr>
<td></td>
<td>• Recognize the steps of respiration in Human Beings.</td>
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<tr>
<td></td>
<td>• Explain the steps of respiration in Human Beings.</td>
</tr>
</tbody>
</table>
- Analyze the various functions of Respiratory organs in Human Beings.
- Explain the process of respiration in Human Beings.
- Perform the activity that we breathe out CO₂ during respiration.
- Demonstrate the process of Fermentation.
- Draw a well labeled diagram of Human Respiratory System.
- Discriminate and distinguish between Respiration in Plants, Animals and Human Beings.
- Accept the significance of Respiration in Plants, Animals and Human Beings in Biological processes.
- Develop their keen interest in knowing about the types and functions of Respiration in Plants, Animals and Human Beings.
Transportation
Learners will be able to

<table>
<thead>
<tr>
<th>Objective</th>
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<tbody>
<tr>
<td>• Recall the term Transportation.</td>
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<tr>
<td>• Define the term Transportation.</td>
</tr>
<tr>
<td>• Recall the kinds of Transportation in Plants.</td>
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<tr>
<td>• Recognize the kinds of Transportation in Plants.</td>
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<tr>
<td>• Explain the types of Transportation in Plants.</td>
</tr>
<tr>
<td>• List out the types of Xylem and Phloem tissues in plants.</td>
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<tr>
<td>• Discuss the structure and functions of Xylem &amp; Phloem tissues in plants.</td>
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<tr>
<td>• Draw a well labeled diagram of structure of Xylem &amp; Phloem tissues in plants.</td>
</tr>
<tr>
<td>• Analyze the process of transport of water and minerals in plants through Xylem tissue.</td>
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<tr>
<td>• Analyze the process of transport of food and other substances in plants through Phloem tissue.</td>
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<tr>
<td>• Recall the term Transpiration.</td>
</tr>
<tr>
<td>• Define the term Transpiration.</td>
</tr>
<tr>
<td>• Explain the mechanism of Transpiration in Plants</td>
</tr>
<tr>
<td>• Perform the experiment related to transport of water through xylem cells in plants.</td>
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<tr>
<td>• Conduct the activity to show the phenomenon of transpiration in plants.</td>
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<tr>
<td>• Discuss the mechanism of Transportation in Human Beings.</td>
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<tr>
<td>• List out the components of Blood.</td>
</tr>
<tr>
<td>• Recognize the functions of Blood Circulatory System.</td>
</tr>
<tr>
<td>• Explain the functions of Blood Circulatory System.</td>
</tr>
<tr>
<td>• Identify the functions of Lymphatic System.</td>
</tr>
<tr>
<td>• Differentiate between Blood Circulatory System and Lymphatic System.</td>
</tr>
<tr>
<td>• Recognize the components of Blood Circulatory System and Lymphatic System.</td>
</tr>
</tbody>
</table>
- Distinguish between arteries, veins and capillaries.
- Distinguish between lymph, lymph nodes, lymph capillaries and lymph vessels.
- Describe the structure and working of Human Heart.
- Draw a well labeled diagram of Human Heart.
- Recall the term Blood Pressure.
- Recognize the term Blood Pressure.
- Define the term Blood Pressure.
- Explain the mechanism of Blood Pressure.
- Perform the activity to measure the Blood Pressure.
- Differentiate between Transport in Plants and Human Beings.
- Accept the significance of Transportation in Plants and Human Beings in Biological processes.
- Develop their keen interest in knowing about the types and functions of Transportation in Plants and Human Beings.
Excretion
Learners will be able to

- Recall the term Excretion.
- Recognize the term Excretion.
- Define the term Excretion.
- Recall the term Osmoregulation.
- Recognize the term Osmoregulation.
- Define the term Osmoregulation.
- Distinguish between Excretion & Osmoregulation.
- Identify the importance of Excretion & Osmoregulation.
- Cite examples of Excretion in Plants and Animals.
- Explain the various methods of Excretion in Plants.
- Explain the method of Excretion in Amoeba.
- Describe the method of Excretion in Earthworms.
- Explain the process of Excretion in Human Beings.
- List out the various excretory organs in Human Beings.
- Recall the structure and functions of Kidney.
- Explain the structure and functions of Kidney.
- Draw a well labeled diagram of Kidney.
- Recall the term Nephron.
- Recognize the term Nephron.
- Define the term Nephron.
- Discuss the structure and functions of Nephron.
| • Draw a well labeled diagram of structure Nephron. |
| • Identify the phenomenon of renal failure and technology for survival. |
| • Explain the steps in the process of nutrition in animals. |
| • Recall the term Dialysis. |
| • Recognize the term Dialysis. |
| • Define the term Dialysis. |
| • Explain the process of Dialysis. |
| • Discriminate and distinguish between Excretion in Plants and Animals. |
| • Accept the significance of excretion in Plants, Animals and Human Beings in Biological processes. |
| • Develop their keen interest in knowing about the functions of excretion in Plants, Animals and Human Beings. |
LESSON - PLAN FOR EXPERIMENTAL GROUP

Unit- Life Processes

CHAPTER- Introduction to Life Processes

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Introduction to life processes

Class: X
Subject: Science (Biology)
Time Limit: 40 Min.

Instructional Objectives: After presenting the lesson, the teacher expects that
Students will be able to
- Recall living things and non-living things.
- Define living things and non-living things.
- Cite examples of living and non-living things.
- List out the characteristics of living things.
- Define the term life processes.
- Cite examples of life processes.
- Apply the concept that energy is needed for life processes in daily life situations.
- Develop their keen interest to know about various life processes.

Material to be used: IT-Enabled Instructional Package in Science (Biology)

Introduction: First of all, teacher will establish a good rapport with the students and give
them orientation about IT-Enabled Instructional Package. After that he will quickly
review the basic concepts of students about various biological processes to make a strong
link between previous knowledge and current topic.

Previous Knowledge: The teacher will motive the students by asking them the following
questions with the help of their previous knowledge.

1. What are basic processes occurring in life?
2. What is needed to maintain a state of order in our body?
3. What is the most important criteria to decide whether something is alive or not?

Method and Procedures

A) Presentation

Teacher will present the content on basic concepts of life processes with the help of
IT-Enabled lesson plan slides arranged in logical and systemic manner one by one
.after teaching each sub-points there will be some evaluation slides (having MCQ) with positive feedback. During presentation, the teacher will communicate with the students to keep them active and to sort out their quarries. The content will be presented in a logical order as given below.

a) General introduction about living things
b) Concept of non-living things.
c) Characteristics of living things.
d) Definition and examples of Life Processes.

The multimedia slides of the topic ‘Life Processes’ are given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on ‘Life Processes’ in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
LESSON - PLAN FOR EXPERIMENTAL GROUP

Unit- Life Processes

CHAPTER- Nutrition

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Nutrition

Class: X
Subject: Science (Biology)
Time Limit: 40 Min.

Instructional Objectives: After presenting the lesson, the teacher expects that
Students will be able to

- Recall the term Nutrients.
- Define the term Nutrition.
- Recognize types of nutrition.
- Cite examples of Autotrophic and Heterotrophic Nutrition.
- Identify the types of Heterotrophic Nutrition.
- Differentiate between various types and sub-types of Nutrition.
- Accept the significance of nutrition in daily life situations.
- Develop their keen interest to know about Nutrition.

Material to be used: IT-Enabled Instructional Package in Science (Biology)

Introduction: First of all, teacher will quickly review the basic concepts of students about living things, non-living things and ask definition and examples of various life processes to make a strong link between previous knowledge and current topic.

Previous Knowledge: The teacher will motive the students by asking them the following questions with the help of their previous knowledge.

1. What are living things?
2. What is the basic unit of life?
3. How do we get energy to maintain a state of order in our body?
4. How do living things get their food?
5. Give some examples of nutrients.

Method and Procedures

A) Presentation

Teacher will present the content on basic concepts of nutrition with the help of IT-Enabled lesson plan slides arranged in logical and systemic manner one by one.
teaching each sub-points there will be some evaluation slides (having MCQ) with positive feedback. During presentation, the teacher will communicate with the students to keep them active and to sort out their quarries. The content will be presented in a logical order as given below.

a) General introduction about Nutrients

b) Definition and examples of Nutrients.

c) Definition of Nutrition.

d) Two Modes of Nutrition.

e) Autotrophic Nutrition and its examples.

f) Heterotrophic Nutrition and its examples.

i) Types of Heterotrophic Nutrition

j) Saprotrophic Nutrition

k) Parasitic Nutrition

l) Holozoic Nutrition

The multimedia slides of the topic ‘Nutrition’ are given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on ‘Nutrition’ in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
LESSON - PLAN FOR EXPERIMENTAL GROUP

Unit- Life Processes

CHAPTER- Nutrition in Plants

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Nutrition in Plants

Instructional Objectives: After presenting the lesson, the teacher expects that
Students will be able to
• Define the term Photosynthesis.
• Recall the process of Photosynthesis.
• Identify the steps of Photosynthesis.
• Explain the steps of Photosynthesis.
• Discuss the conditions necessary for Photosynthesis.
• Perform the experiments related to conditions necessary for Photosynthesis.
• Accept the significance of Photosynthesis in various biological activities
• or day today life.
• Develop their keen interest to know about Nutrition in Plants.

Material to be used: IT-Enabled Instructional Package in Science (Biology)

Introduction: First of all, teacher will quickly review the basic concepts of students
about nutrition, modes of nutrition, difference between various types and sub-types of
nutrition to make a strong link between previous knowledge and current topic.

Previous Knowledge: The teacher will motive the students by asking them the following
questions with the help of their previous knowledge.
1. What is autotrophic nutrition?
2. Give some examples of autotrophic nutrition.
3. How green plants obtain their food?
4. What is the process of nutrition in plants?

Method and Procedures

C) Presentation

Teacher will present the content on basic concepts of nutrition in plants with the help
of IT-Enabled lesson plan slides arranged in logical and systemic manner one by one
after teaching each sub-points there will be some evaluation slides (having MCQ)
with positive feedback. During presentation, the teacher will communicate with the students to keep them active and to sort out their quarries. The content will be presented in a logical order as given below.

a) Concept of Photosynthesis.
b) Diagrammatic representation of steps of Photosynthesis.
c) Three basic steps of Photosynthesis.
d) Conditions necessary for Photosynthesis.
e) Experiment 1. To show that Sunlight is necessary for Photosynthesis.
f) Experiment 2. To show that Chlorophyll is necessary for Photosynthesis.
g) Experiment 3. To show that CO₂ is necessary for Photosynthesis.

The multimedia slides of the topic ‘Nutrition in Plants’ is given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on ‘Nutrition in Plants’ in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
LESSON - PLAN FOR EXPERIMENTAL GROUP

Unit- Life Processes

CHAPTER- Site of Photosynthesis - Chloroplast

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyaapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Site of Photosynthesis - Chloroplast

Class: X
Subject: Science (Biology)
Time Limit: 40 Min.

Instructional Objectives: After presenting the lesson, the teacher expects that
Students will be able to
- Define the term Chloroplast.
- Recognize the structure of Chloroplast.
- Explain the structure of Leaf.
- Describe the structure and working of Stomata.
- Discuss the mechanism of obtaining water by plants for Photosynthesis.
- Draw a well labeled diagram of structure of Leaf.
- Accept the significance of Photosynthesis in various biological activities.
- Develop their keen interest to know about Site of Photosynthesis - Chloroplast.

Material to be used: IT-Enabled Instructional Package in Science (Biology)

Introduction: First of all, teacher will quickly review the basic concepts of students about Photosynthesis, steps of Photosynthesis and conditions necessary for Photosynthesis to make a strong link between previous knowledge and current topic.

Previous Knowledge: The teacher will motive the students by asking them the following questions with the help of their previous knowledge.

1. What is Photosynthesis?
2. What are the basic steps of Photosynthesis?
3. What is the site of Photosynthesis?
4. Name the organelles responsible for Photosynthesis.

Method and Procedures

D) Presentation

Teacher will present the content on basic concepts of site of photosynthesis-chloroplast with the help of IT-Enabled lesson plan slides arranged in logical and systemic manner one by one. After teaching each sub-points there will be some evaluation slides (having MCQ) with positive feedback. During presentation, the
teacher will communicate with the students to keep them active and to sort out their quarries. The content will be presented in a logical order as given below.

a) Diagrammatic representation of chloroplasts by showing single green leaf.
b) Definition and location of chloroplasts.
c) Cross-section of Leaf.
d) Detailed diagrammatic representation of layers of Leaf.
h) Structure and working of Stomata.
i) Opening and Closing of Stomata.
j) Mechanism of obtaining water by plants for Photosynthesis.

The multimedia slides of the topic ‘Nutrition in Plants’ is given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on ‘Site of Photosynthesis - Chloroplast’ in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
LESSON - PLAN FOR EXPERIMENTAL GROUP

UNIT- Life Processes

CHAPTER- Nutrition in Animals

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Nutrition in Animals
Class: X
Subject: Science (Biology)
Time Limit: 40 Min.

Instructional Objectives: After presenting the lesson, the teacher expects that
Students will be able to
• Recall the concept of Nutrition in Animals.
• Recognize the categories of Holozoic Animals.
• Define Herbivores, Carnivores and Omnivores.
• Cite examples of Herbivores, Carnivores and Omnivores.
• Analyze the process of obtaining energy from the sun.
• Identify the structure of Amoeba.
• Explain the stages of nutrition in Amoeba.
• Describe the process of nutrition in Paramecium.
• Draw a well labeled structure of Amoeba and Paramecium.
• Accept the significance of Nutrition in Animals in various biological processes.
• Develop their keen interest to know about Nutrition in Animals

Material to be used: IT-Enabled Instructional Package in Science (Biology)

Introduction: First of all, teacher will quickly review the basic concepts of students
about Nutrition, Nutrition in Plants, Chloroplasts, Structure and working of Stomata,
Process of obtaining food and water by plants to make a strong link between previous
knowledge and current topic.

Previous Knowledge: The teacher will motive the students by asking them the following
questions with the help of their previous knowledge.
1. What is the site of Photosynthesis?
2. How plants obtain their food?
3. How plants obtain water for photosynthesis?
4. How animals obtain their food?
5. What is the process to get energy by plants and animals?
Method and Procedures

A) Presentation

Teacher will present the content on basic concepts of Nutrition in Animals with the help of IT-Enabled lesson plan slides arranged in logical and systematic manner one by one. After teaching each sub-point, there will be some evaluation slides (having MCQ) with positive feedback. During presentation, the teacher will communicate with the students to keep them active and to sort out their quarries. The content will be presented in a logical order as given below.

a) Concept of Nutrition in Animals.
b) Categories of Holozoic Animals.
c) Herbivores and its examples.
d) Carnivores and its examples.
e) Omnivores and its examples.
f) Nutrition in Amoeba.
g) Diagrammatic representation of Nutrition in Amoeba.
h) Nutrition in Paramecium.

The multimedia slides of the topic 'Nutrition in Plants' is given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on 'Nutrition in Animals' in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
LESSON - PLAN FOR EXPERIMENTAL GROUP

UNIT- Life Processes

CHAPTER- Nutrition in Human Beings

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Nutrition in Human Beings
Class: X
Subject: Science (Biology)
Time Limit: 40 Min.

**Instructional Objectives:** After presenting the lesson, the teacher expects that
Students will be able to
- Recall the concept of Nutrition in human beings.
- List out the various organs and associated glands of human digestive system.
- Explain the steps of human digestive system.
- Analyze the process take place in human digestive tract.
- Discuss the working of human digestive system.
- Label the diagram of Human Alimentary Canal.
- Draw a well labeled diagram of digestive organs.
- Perform an activity about the action of saliva on starch.
- Accept the significance of Nutrition in human beings in various biological processes.
- Develop their keen interest to know about human digestive system.

**Material to be used:** IT-Enabled Instructional Package in Science (Biology)

**Introduction:** First of all, teacher will quickly review the basic concepts of students about Nutrition, Nutrition in Plants, Nutrition in Animals, Categories of Holozoic Animals, Process of obtaining food by animals like Amoeba and Paramecium to make a strong link between previous knowledge and current topic.

**Previous Knowledge:** The teacher will motive the students by asking them the following questions with the help of their previous knowledge.
1. How plants obtain their food?
2. How animals obtain their food?
3. Name the category of human being. Are they Herbivores, Carnivores or Omnivores?
4. What is the process of nutrition in Human Beings?
Method and Procedures

B) Presentation

Teacher will present the content on basic concepts of Nutrition in Human Beings with the help of IT-Enabled lesson plan slides and video arranged in logical and systematic manner one by one. After teaching each sub-points there will be some evaluation slides (having MCQ) with positive feedback. During presentation, the teacher will communicate with the students to keep them active and to sort out their queries. The content will be presented in a logical order as given below.

a) Concept of Nutrition in Human Beings.
b) Diagrammatic representation of various organs and associated glands in Human Digestive System.
c) Steps of Nutrition in Human Beings.
d) Diagrammatic representation and explanation of Digestive Tract
e) Human Alimentary Canal (Press the button to know about body organs.)
f) Video of Human Digestive System.
g) Activity ‘To Demonstrate the Action of Saliva on Starch’.

The multimedia slides of the topic ‘Nutrition in Human Beings’ is given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on ‘Nutrition in Human Beings’ in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
LESSON - PLAN FOR EXPERIMENTAL GROUP

UNIT- Life Processes

CHAPTER- Dental Caries

Name of Teacher: Parvesh Lata
School: Bal Bharti Vidyapeeth Sr. Sec. School, Gohana
Class: X
Age level of class: 16-18 yrs.
Group: Experimental
Estimated Time of Lesson: 40 minutes
LESSON - PLAN

Name of Teacher: Parvesh Lata
Group: Experimental
Topic: Dental Caries

Class: X
Subject: Science (Biology)
Time Limit: 40 Min.

Instructional Objectives: After presenting the lesson, the teacher expects that Students will be able to

- Recall the term Dental Caries.
- Define the term Dental Caries
- Recognize the Parts of Tooth.
- Explain the concept of Dental Caries.
- Discuss the process of Enamel Dissolution.
- List out the precautions taken to prevent Dental Caries.
- Draw a well labeled diagram of Parts of Tooth.
- Apply the precautions taken to prevent dental caries in daily life situations.
- Develop their keen interest to know Dental Caries.

Material to be used: IT-Enabled Instructional Package in Science (Biology)

Introduction: First of all, teacher will quickly review the basic concepts of students about Nutrition, Nutrition in Plants, Nutrition in Animals, Nutrition in human beings, working of human digestive system to make a strong link between previous knowledge and current topic.

Previous Knowledge: The teacher will motive the students by asking them the following questions with the help of their previous knowledge.

1. What is the process of nutrition in Human Beings?
2. List out the food items which you eat daily.
3. What is the effect of junk food on our body organs?
4. Which part of our body badly affected by eating chocolates?
5. Which is the most sensitive part of our body?
Method and Procedures

C) Presentation

Teacher will present the content on basic concepts of Nutrition in Human Beings with the help of IT-Enabled lesson plan slides and video arranged in logical and systematic manner one by one. After teaching each sub-points there will be some evaluation slides (having MCQ) with positive feedback. During presentation, the teacher will communicate with the students to keep them active and to sort out their quarries. The content will be presented in a logical order as given below.

a) Diagrammatic representation of Parts of Tooth.
b) Concept of Dental Caries.
c) Process of Enamel Dissolution
h) Diagrammatic representation of Dental Caries.
i) Precautions taken to prevent Dental Caries.

The multimedia slides of the topic ‘Dental Caries’ is given in Appendix E-2.

B) Formative Evaluation

After finishing the presentation, the teacher will do formative evaluation of the students with the help of MCQs based on ‘Dental Caries’ in an interactive manner with positive feedback. The evaluation slides are given in Appendix E-2.
MULTIMEDIA PRESENTATION SLIDES
Conventional Method of Instruction
Laboratory Method
IT-Enabled Instructional Method
The most important criteria to decide whether something is alive or not is the movement. All the living things (which are alive) move by themselves without any external help.

Non living things can not move by themselves. See the stone movement by applying force.

All the living things are made up of tiny living units called cells. The life processes performed by living organisms to maintain their life on this earth are called life processes. E.g. nutrition and respiration, transport and excretion, control and coordination, growth movement and reproduction. Energy is needed for the life processes.
All living organisms need nutrients (food) to build up their body molecules & to get energy for doing work.

(Glucose + Starch) Carbohydrate

Nutrients are inorganic as well as organic substance which the organism obtain from their surrounding in order to synthesize their body constituents and use them as a source of energy.

Nutrition (the word derived from the term nutrient) is defined as the intake of nutrients and utilization by an organism in various biological activities.

Autotrophic Nutrition

Autotrophic Nutrition is that mode of nutrition in which an organism makes its own food from the simple inorganic material like CO2 and water present in the surroundings. Green plants have an autotrophic mode of nutrition.

Heterotrophic Nutrition

Heterotrophic Nutrition is that mode of nutrition in which an organism can not make its own food from simple inorganic material like CO2 and water and depends on other organism for its food.
APPENDIX-E-2

Types of Heterotrophic Nutrition

Saprotrophic Nutrition
in which an organism obtains its food from decaying organic matter of dead plants, dead animals and rotten bread etc.

Parasitic Nutrition
in which an organism derives its food from the body of another living organism (called its host) without killing it.

Holozoaic Nutrition
means "feeding on solid food" In which an organism takes the complex organic food materials into its body by the process of ingestion, digestion, absorption.
What criteria can be used to decide whether something is alive?

A) Movement  
B) Growth  
C) Reproduction  
D) Respiration

Choose the right Option

Which of the following type of energy is used by living organisms to perform vital life processes?

A) Kinetic energy  
B) Chemical energy  
C) Potential energy  
D) Nuclear energy

Choose the right Option

Which is the basic requirement of living organism for obtaining energy?

A) Air  
B) Water  
C) Food  
D) None of the above

Choose the right Option

Nutrition includes the study of

1. The organism's food  
2. Process of digestion  
3. The way an organism obtains food  
4. All of the above

Choose the Right Option
### Autotrophic organisms include
1. Green plants and sulphur bacteria
2. Green plants and all the bacteria
3. Bacteria and virus
4. Bacteria and fungi

Well Done

Move to the next Question

### What is the mode of nutrition in fungi?
A) Saprotrophic
B) Heterotrophic
C) Parasitic
D) Holozoic

Choose the Right Option

### What is the mode of nutrition in fungi?
A) Saprotrophic
B) Heterotrophic
C) Parasitic
D) Holozoic

Choose the Right Option

### In Saprophytes, food is digested
1. Within the cells
2. In the digestive tract
3. Outside the cells
4. Within the food vacuole

You have given all Right Answers
What is Photosynthesis?

The process by which green plants make their own food from Carbon Dioxide and water by using sunlight energy in the presence of chlorophyll, is called photosynthesis.

6 CO₂ + 6 H₂O → light energy → C₆H₁₂O₆ + 6 O₂

The process by which green plants make their own food from Carbon Dioxide and water by using sunlight energy in the presence of chlorophyll, is called photosynthesis.

So, the process of Photosynthesis takes place in the following three steps:

1. Absorption of sunlight energy by chlorophyll
2. Conversion of light energy into chemical energy and splitting of water into hydrogen and oxygen by light energy
3. Reduction of Carbon Dioxide by hydrogen to form carbohydrate like glucose by utilising the chemical energy

Conditions necessary for photosynthesis:

- **Sunlight**
- **Chlorophyll**
- **Carbon dioxide**
- **Water**

The experiment on photosynthesis is depends on the fact that green leaves make starch as food and starch gives a blue black colour with iodine solution.

Let us do some experiments to show that Sunlight, Chlorophyll & Carbon Dioxide are necessary for Photosynthesis by Green Plants.
How Digestive System Works?

Let us perform an activity
To demonstrate the action of saliva on starch

OBSERVATION AND CONCLUSION
The blue colour appears in test tube B showing the presence of starch.
The blue colour does not appear in test tube A.
This indicates that salivary amylase present in saliva has broken down
into soluble sugar.
The area of leaf which was covered with aluminium foil does not turn blue black on adding iodine solution showing no presence of starch.

The area of the leaf which was exposed to sunlight turns blue black on adding iodine solution showing presence of starch. We can conclude that sunlight is necessary for photosynthesis.

Activity 1
To show that sunlight is necessary for photosynthesis

Conclusion:
Outer Part turns Blue Black Showing the presence of starch
Inner Part does not turn blue black showing no presence of starch.
So, Chlorophyll is necessary for the process of photosynthesis to take place.

Activity 2
To show that chlorophyll is necessary for photosynthesis

Activity 3
To show that CO₂ is necessary for photosynthesis
The area of leaf which was covered with aluminium foil does not turn blue black on adding iodine solution showing no presence of starch. The area of the leaf which was exposed to sunlight turns blue black on adding iodine solution showing presence of starch. We can conclude that sunlight is necessary for photosynthesis.

Activity.1
To show that sunlight is necessary for photosynthesis

Activity.2
To show that chlorophyll is necessary for photosynthesis

Activity.3
To show that CO$_2$ is necessary for photosynthesis

Let us do an experiment to show that Carbon Dioxide is necessary for photosynthesis. Take a potted plant having long and narrow leaves.
### Assignment: Nutrition in Plants

#### Start

**During photosynthesis, food is synthesized in the form of:**

- (A) Proteins
- (B) Fats
- (C) Carbohydrates
- (D) Vitamins

**Move to the next Question.**

**Choose the right option:**

**The end products of photosynthesis are:**

- (A) Carbohydrate and Hydrogen
- (B) Carbohydrate and Oxygen
- (C) Water and Carbon Dioxide
- (D) Carbohydrate, Water and Oxygen

**Choose the right option**

**Iodine turns blue black on reacting with:**

- (A) Starch
- (B) Alcohol
- (C) Chlorophyll
- (D) None of the above

**Well Done**
Different Stages in the Nutrition of Amoeba

- Pseudopodia
- Enzymes entering
- Food/Vecuote
- Amoeba

- (Ingestion)
- (Digestion)
- (Absorption)
- (Assimilation)
- (Egestion)

Nutrition in Paramecium

Paramecium is also a tiny unicellular animal which lives in water. It uses its hair-like structure like cilia to sweep the food particles from water and put them into mouth.

The various organs of the human digestive system: mouth, oesophagus, stomach, small intestine, and large intestine. Associated glands are: salivary glands, liver, and pancreas.

Various Steps of Nutrition in Human Beings

- Ingestion
- Digestion
- Absorption
- Assimilation
- Egestion

DIGESTIVE TRACT

The stomach is a muscular organ responsible for the storage and mixing of food. The food then travels down to the small intestine, where digestion continues.

Next Next
Let Us Do Some Practice Questions

Nutrition in Animals

Start

What is the ultimate source of energy for all living organisms?

(a) **Solar energy** Right Answer
(b) Water energy
(c) Muscular energy
(d) Wind energy

Choose The Right Option

Amoeba feeds with the help of ____________

(a) Tentacles
(b) **Pseudopodia** Right Answer
(c) Food vacuole
(d) None of the above

Choose The Right Option

An example of a herbivore is ____________

(a) Amoeba
(b) Hydra
(c) **Grasshopper** Right Answer
(d) None of the above

Choose The Right Option

Human beings are ____________

(a) Herbivores
(b) **Carnivores** Try Again
(c) Omnivores
(d) None of the above

Choose The Right Option
The hard outer covering of a tooth is called enamel. The part of tooth below enamel is called dentine. Inside the dentine is pulp cavity it contains nerves and blood vessels.

DENTAL CARIES

The formation of small cavities in the teeth due to action of acid forming bacteria and improper dental care is called dental caries. If the teeth are not cleaned regularly, they become covered with a sticky yellowish layer of food particles and bacteria cells called dental plaque. Since plaque covers the teeth forming a layer over them the, alkaline saliva cannot reach the tooth surface to neutralise the acid formed by bacteria and hence tooth decay sets in.

HOW ENAMEL DISSOLUTION TAKES PLACE?

PREVENTION

Brushing the teeth regularly after eating food removes the plaque before bacteria produces acids. Getting professional dental cleaning twice a year

Reduce the amount of acid in your mouth by eating sugary or starchy foods less often during the day. Snacking is more likely to lead to caries than avoiding between-meal snacks. Chewing gum that contains xylitol helps to counteract the acidity that occurs after eating.

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What is the part of the tooth you can see above the gum?

a) Crown  

b) Pulp  \textit{Wrong Answer}

c) Cap  

d) Cavity

Choose The Right Option

What hard, tough and shiny substance cover the crown?

a) Wax  

b) Diamond  

c) Keratin  

d) Enamel  \textit{Right Answer}

Choose The Right Option

The pulp contain \underline{\textit{\textbf{\textcolor{red}{Nerves}}}}, which send messages to the brain if your ice pop is too cold.

a) Blood vessels  

b) Nerves  \textit{Right Answer}

c) Receptors  

d) Brain waves

Well Done

You're right. Thank you from Teeth.