A decorative scroll graphic with the word 'APPENDICES' centered inside. The scroll is oriented horizontally and has a shaded, rounded end on the right side. The word 'APPENDICES' is written in a bold, serif font.

APPENDICES

1. LESSON PLANS FOR CONTROL GROUP

LESSON PLAN-1 (CONTROL GROUP)

Date- 9th APRIL, 2022

Subject- SCIENCE

Duration- 30 minutes

Age level- 13 years

Class - VII

Name- Chakradhar Mahanta

Chapter- NUTRITION IN PLANTS

Topic- NUTRITION AND PHOTOSYNTHESIS

Learning Objectives

Students will be able to know-

- Nutrients
- Nutrition
- Autotrophic nutrition
- Food factories of plants- Leaves
- Food making process in plants
- Chlorophyll
- Source of energy for Photosynthesis
- Synthesis of carbohydrates

Process Skills:

Observation, investigations, interpretation, classification, communication, discussion with teacher and peers, reasoning, definitions, questioning, logical thinking, problem solving.

Opportunities for constructive learning environment:

Learners will be able to extend their understandings on nutrition, mode of nutrition and can observe in their day-to-day life.

Teaching learning Materials & Learning Resources:

Textbook, Blackboard, Chalk, a chart containing different kind of food, a chart containing different parts of a leaf etc.

Learning Situation:

Learning approach based on inquiry-based science teaching.

understanding of concepts)	The teacher must provide scaffoldings where needed.	explanation with respect to their pre-conceived knowledge.
Evaluate (On-going process)	Continuous process of making observations of learners as they apply new concepts and skills and looking for evidence that the learners have changed or modified their thinking. The learners who have lacked conceptual understanding after such rigorous intricate interventions are further explained and elaborated and course is delivered successfully.	Learners still would have queries about topic. Help could be provided.

Reflection: Learners were intrigued about the interdisciplinary dynamics of the topic and infographics and asked for explanations of processes occurring there.

LESSON PLAN-2 (CONTROL GROUP)

Date- 11th APRIL, 2022

Subject- SCIENCE

Duration-30 minutes

Age level- 13 years

Class -VII

Name- Chakradhar Mahanta

Chapter-NUTRITION IN PLANTS

Topic- SYNTHESIS OF PLANT FOOD

Learning Objectives

Students will be able to know-

- Synthesis of Protein and fat

Process Skills:

Observation, investigations, interpretation, classification, communication, discussion with teacher and peers, reasoning, definitions, questioning, logical thinking, problem solving.

Opportunities for constructive learning environment:

Learners will be able to extend their understandings on nutrition, mode of nutrition and can observe in their day-to-day life.

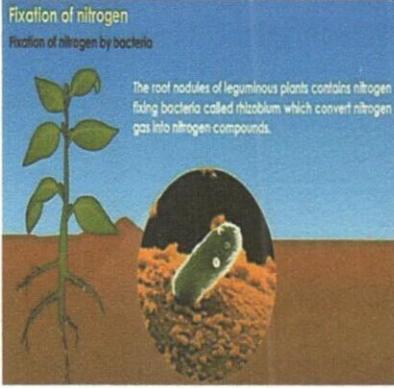
Teaching learning Materials & Learning Resources:

Textbook, Blackboard, Chalk etc.

Learning Situation:

Learning approach based on inquiry-based science teaching.

5E	Teacher	Learner
Engage (Prior knowledge or misconceptions)	To know Prior knowledge by questioning. Synthesis of carbohydrates? Other components of food if they?	They will answer
Explore (Introduction of new material)	Correlate with the text book.	Learner will think and initiate

<p>Explain (Teacher directs and guides the students)</p>	<p>Now the teacher can explain the synthesis of other food components like protein and fat.</p> 	<p>Learners will provide their explanation and understanding on concept before teacher starts explaining.</p> <p>Learners will further interrupt, interfere & question the explanations where they find any doubts and discrepancies.</p>
<p>Elaborate (Deeper and broader understanding of concepts)</p>	<p>Learners will be taught about nitrogen fixation.</p> <p>Different students will answer differently.</p> <p>The teacher must provide scaffoldings where needed.</p>	<p>Learners will ask doubts in the concepts and question the explanation with respect to their pre-conceived knowledge.</p>
<p>Evaluate (On-going process)</p>	<p>Continuous process of making observations of learners as they apply new concepts and skills and looking for evidence that the learners have changed or modified their thinking. The learners who have lacked conceptual understanding after such rigorous intricate interventions are further explained and elaborated and course is delivered successfully.</p>	<p>Learners still would have queries about topic.</p> <p>Help could be provided.</p>

Reflection: Learners were intrigued about the interdisciplinary dynamics of the topic and infographics and asked for explanations of processes occurring there.

LESSON PLAN-3 (CONTROL GROUP)

Date- 13TH APRIL, 2022

Subject- SCIENCE

Duration- 30 minutes

Age level- 13 years

Class - VII

Name- Chakradhar Mahanta

Chapter- NUTRITION IN PLANTS

Topic- HETEROTROPIC/ PARASITIC MODE OF NUTRITION

Learning Objectives

Students will be able to know-

- Plants without chlorophyll
- How do they survive?
- From where do they derive nutrition?
- Parasite

Process Skills:

Observation, investigations, interpretation, classification, communication, discussion with teacher and peers, reasoning, definitions, questioning, logical thinking, problem solving.

Opportunities for constructive learning environment:

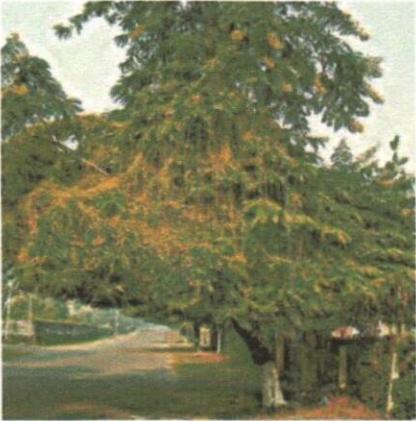
Learners will be able to extend their understandings on nutrition, mode of nutrition and can observe in their day-to-day life.

Teaching learning Materials & Learning Resources:

Textbook, Blackboard, Chalk etc.

Learning Situation: Learning approach based on inquiry-based science teaching.

5E	TEACHER	LEARNER
Engage (Prior knowledge or misconceptions)	To know Prior knowledge by questioning. Role of chlorophyll? What happens if a plant does lose leaves? Is there any possibility to survive?	They will answer

<p>Explore (Introduction of new material)</p>	<p>Correlate with the text book.</p>	<p>Learner will think and initiate</p>
<p>Explain (Teacher directs and guides the students)</p>	<p>Now the teacher can explain heterotrophic mode of nutrition.</p>  <p>Fig. 1.5 <i>Cuscuta</i> (Amarbel) on host plant</p>	<p>Learners will provide their explanation and understanding on concept before teacher starts explaining.</p> <p>Learners will further interrupt, interfere & question the explanations where they find any doubts and discrepancies.</p>
<p>Elaborate (Deeper and broader understanding of concepts)</p>	<p>Learners will be asked some questions regarding parasite.</p> <p>Different students will answer differently.</p> <p>The teacher must provide scaffoldings where needed.</p>	<p>Learners will ask doubts in the concepts and question the explanation with respect to their pre-conceived knowledge.</p>
<p>Evaluate (On-going process)</p>	<p>Continuous process of making observations of learners as they apply new concepts and skills and looking for evidence that the learners have changed or modified their thinking.</p> <p>The learners who have lacked conceptual understanding after such rigorous intricate interventions are</p>	<p>Learners still would have queries about topic.</p> <p>Help could be provided.</p>

	further explained and elaborated and course is delivered successfully.	
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Reflection: Learners were intrigued about the interdisciplinary dynamics of the topic and infographics and asked for explanations of processes occurring there.

LESSON PLAN-4 (CONTROL GROUP)

Date- 16TH APRIL, 2022

Subject- SCIENCE

Duration-30 minutes

Age level- 13 years

Class -VII

Name- Chakradhar Mahanta

Chapter-NUTRITION IN PLANTS

Topic- INSECTIVOROUS/CARNIVOROUS PLANTS AND SAPPROPHITIC MODE OF NUTRITION

Learning Objectives

Students will be able to know-

- How these plants take insects as their food
- Mushrooms
- Fungi
- How different from green plants

Process Skills:

Observation, investigations, interpretation, classification, communication, discussion with teacher and peers, reasoning, definitions, questioning, logical thinking, problem solving.

Opportunities for constructive learning environment:

Learners will be able to extend their understandings on nutrition, mode of nutrition and can observe in their day-to-day life.

Teaching learning Materials & Learning Resources:

Textbook, Blackboard, Chalk etc.

Learning Situation: Learning approach based on inquiry-based science teaching.

5E	Teacher	Learner
Engage (Prior knowledge or misconceptions)	To know Prior knowledge by questioning. If they know about these kinds of plants?	They will answer

	saprophytic mode of nutrition of Fungi?	
Explore (Introduction of new material)	Correlate with the text book.	Learner will think and initiate
Explain (Teacher directs and guides the students)	<p>Now the teacher can explain the mode of nutrition of these kinds of plants.</p>  <p>Fig. 1.6 Pitcher plant showing lid and pitcher</p>  <p>Fig. 1.8 Fungi growing on bread</p>  <p>Fig. 1.7 Packet of mushrooms, a mushroom growing on decayed material</p>	<p>Learners will provide their explanation and understanding on concept before teacher starts explaining.</p> <p>Learners will further interrupt, interfere & question the explanations where they find any doubts and discrepancies.</p>

<p>Elaborate (Deeper and broader understanding of concepts)</p>	<p>Learners will be asked some questions-</p> <p>Why do they need other kind of foods when they are autotrophs?</p> <p>Different students will answer differently.</p> <p>The teacher must provide scaffoldings where needed.</p>	<p>Learners will ask doubts in the concepts and question the explanation with respect to their pre-conceived knowledge.</p>
<p>Evaluate (On-going process)</p>	<p>Continuous process of making observations of learners as they apply new concepts and skills and looking for evidence that the learners have changed or modified their thinking.</p> <p>The learners who have lacked conceptual understanding after such rigorous intricate interventions are further explained and elaborated and course is delivered successfully.</p>	<p>Learners still would have queries about topic.</p> <p>Help could be provided.</p>

Reflection: Learners were intrigued about the interdisciplinary dynamics of the topic and infographics and asked for explanations of processes occurring there.

2. LESSON PLANS FOR EXPERIMENTAL GROUP

COOPERATIVE LEARNING STRATEGY LESSON PLAN-01

Subject: Science

Class: VII

Chapter: Nutrition in Plants

Topic: Photosynthesis

Duration: 30 min

Date: 9TH April, 2022

Materials: Visual Aids, pictures, drawing sheets, pencils, cards etc.

Previous Knowledge: The students are aware that all living things have life and have certain characteristics.

Objectives: Provided with materials, students will be able to:

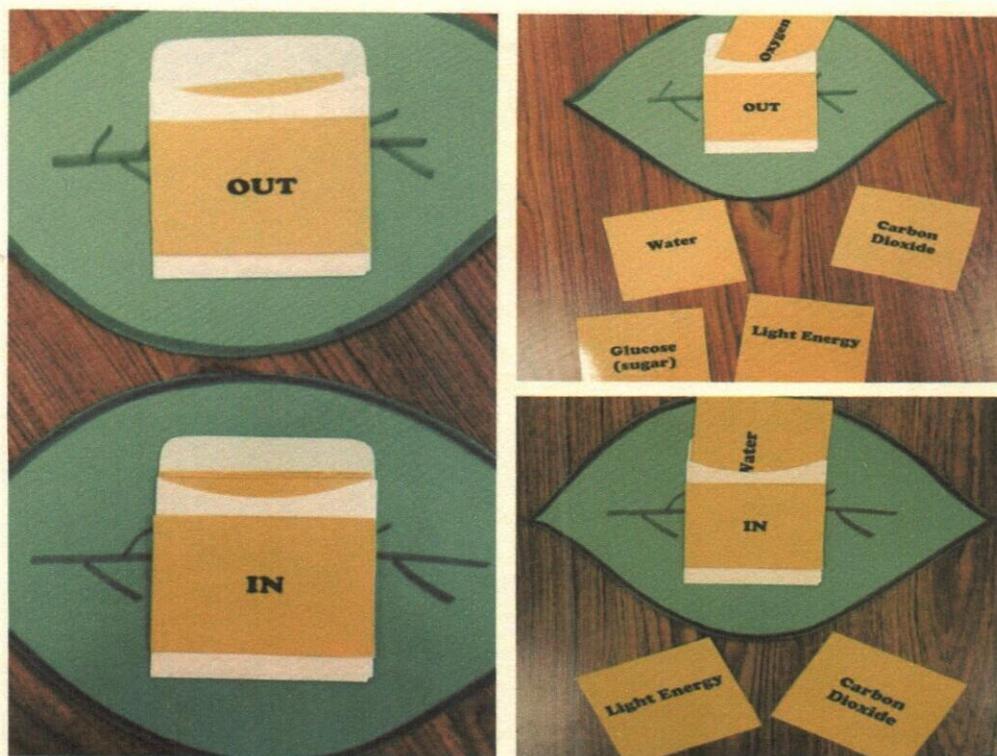
- Define the word “Photosynthesis” and understand the autotrophs.
- Assemble the pictures of reactants and products.
- Appreciate the importance of Photosynthesis.

Concepts:

- Plants can produce food themselves by photosynthesis.
- Source of energy for Photosynthesis.
- Synthesis of carbohydrates.

Skills:

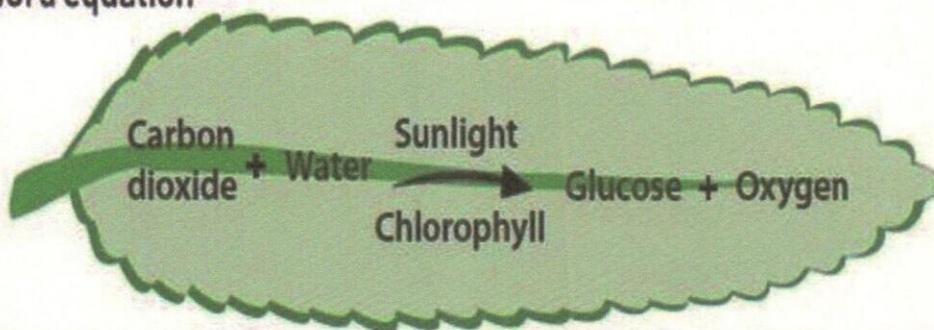
Define photosynthesis.



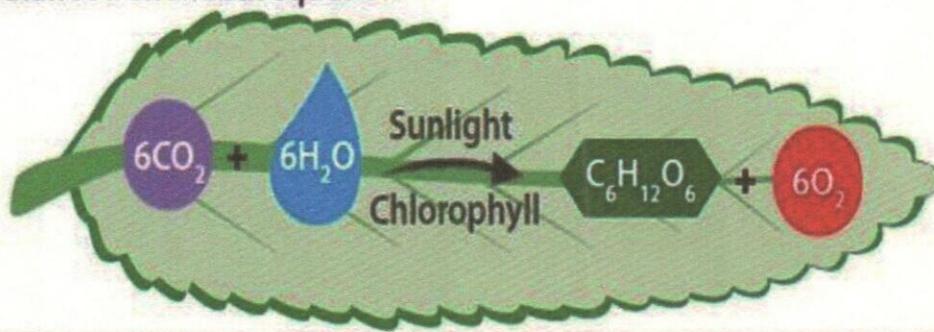
Construct the photosynthesis equation with given pictures - Discuss its importance.

Photosynthesis - Equations

Word equation



Balanced chemical equation



TOPIC	TEACHER ACTIVITY	STUDENTS ACTIVITY	SKILLS
Photosynthesis	<ul style="list-style-type: none"> -provides cards to each student -instructs the students to observe the process through Visual aids -Facilitates the students to know the Inputs and out puts of photosynthesis 	<ul style="list-style-type: none"> -write down various inputs like sun lights, CO₂, water etc and outputs like Oxygen. -construct the process of photosynthesis 	<ul style="list-style-type: none"> -brain-storming -sharing thought -creativity -discipline -character building

Conclusion: Provide a worksheet for students,

Students will be asked to construct their own and to label a plant performing photosynthesis.

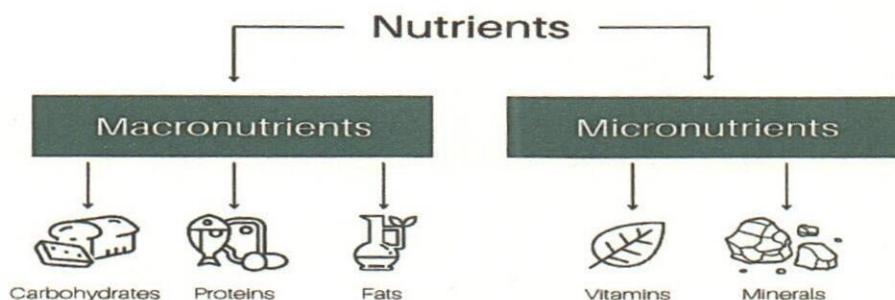
Evaluation:

Strengths:

Areas for Improvement:

Nitrogen Fixing bacteria like Rhizobium converts atmospheric nitrogen in to nitrogenous compound for plants and in return they get photosynthesis products from the plants.

Macronutrients and micronutrients-



TOPIC	TEACHER ACTIVITY	STUDENTS ACTIVITY	SKILLS
Carnivorous Plants	provides cards to each student -instructs the students about Nitrogen Fixing bacteria like Rhizobium etc. and their work. -Facilitates the students how to differentiate- Macronutrients and micronutrients.	Students will mention Nitrogen fixation. With the cooperation of all the students show the different examples of Macronutrients and micronutrients.	-sharing thought -creativity -democratic environment -character building -respect to others' opinion.

Conclusion: Provide a worksheet for students;

- Students will be asked to construct their own and to label Nitrogen fixation.

Evaluation:

Strengths:

Areas for Improvement:

COOPERATIVE LEARNING STRATEGY LESSON PLAN-03

Subject: Science

Class: VII

Chapter: Nutrition in Plants

Topic: Heterotrophic/ Parasitic Mode of Nutrition

Duration: 30 min

Date: 13TH April, 2022

Materials: Visual Aids, pictures, drawing sheets, pencils, cards etc.

Previous Knowledge: The students are aware that all living things and their mode of nutrition.

Objectives: Provided with materials, students will be able to:

- Define the word 'Heterotrophic Mode of Nutrition' and understand the heterotrophs.
- Assemble the pictures of different heterotrophs.

Concepts:

- Who are the heterotrophs?
- Source of energy for them.
- Classification and different examples.

Skills:

Define Heterotrophic Mode of Nutrition and Classification-

COOPERATIVE LEARNING STRATEGY LESSON PLAN-04

Subject: Science

Class: VII

Chapter: Nutrition in Plants

Topic: Carnivorous Plants

Duration: 30 min

Date: 16TH April, 2022

Materials: YouTube, Visual Aids, pictures, drawing sheets, pencils, cards etc.

Previous Knowledge: The students are aware of different mode of nutrition by plants and animals.

Objectives: Provided with materials, students will be able to:

- Define Carnivorous Plants.
- Assemble the pictures of Carnivorous Plants
- Why these plants are carnivores?

Concepts:

- Some kind of Plants feed on insects although they produce food themselves by photosynthesis.
- The deficiency of nutrients from soil compels these plants to be carnivores.

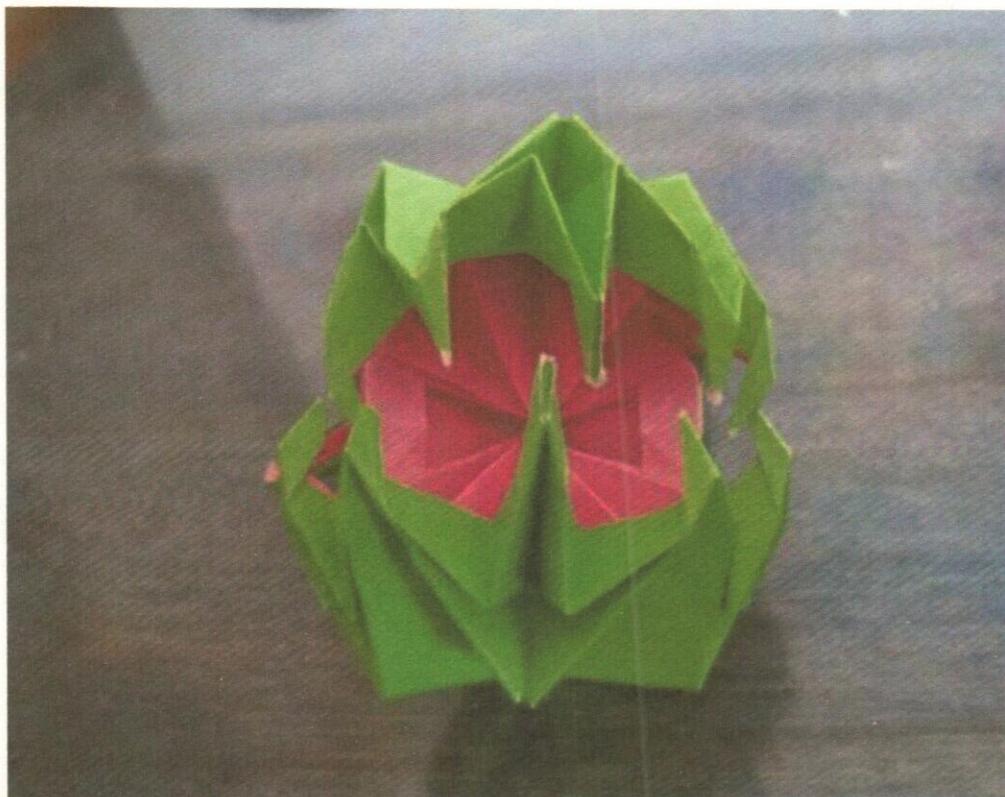
Skills:

Define Saprophytic Mode of Nutrition.

Carnivorous Plants Collection



Construct the carnivorous plants



TOPIC	TEACHER ACTIVITY	STUDENTS ACTIVITY	SKILLS
Carnivorous Plants	<p>provides cards to each student</p> <p>-instructs the students about Carnivorous Plants</p> <p>-Facilitates the students how to differentiate with the aids provided.</p>	<p>Students will mention different Carnivorous Plants With the cooperation of all the students show the different examples of Carnivorous Plants and their mode of nutrition, i.e., Drosera, Venus flytrap, sun dew plant etc.</p>	<p>-sharing thought</p> <p>-creativity</p> <p>-democratic environment</p> <p>-character building</p>

Conclusion: Provide a worksheet for students;

- Students will be asked to construct their own and to label Carnivorous Plants.

Evaluation:

Strengths:

Areas for Improvement:

3. ACHIEVEMENT TEST

NUTRITION IN PLANTS

QUESTIONNAIRE

DT- 18/04/2022

Multiple Choice type

01. What would happen, If a goat eats away all the leaves of a small plant?
- A. Plant will no more.
 - B. Remaining leaves and branches will help to sustain the plant.
 - C. The small plant survived on the food stored in the stem and roots.
 - D. Soil nutrients will help to survive the plant once again.
02. "Leaves Are the Food Factories of Plant". But, How Does Cactus (Desert Plants) Carry Out Photosynthesis?
- A. Roots
 - B. Spines
 - C. Stems
 - D. Green leave
03. Food is essential for all living organisms because
- A. It provides energy
 - B. It helps in growth and repair cells
 - C. It protects our body from various diseases.
 - D. All of these
04. The Cell is enclosed by a thin outer boundary, Called
- A. Cell membrane
 - B. Chromatin
 - C. Cytoplasm
 - D. Nucleus membrane
05. About "Mosquito", which of the following statement is incorrect?
- A. It can be considered as an omnivore.
 - B. The Adult female feeds on blood to supply protein for eggs.
 - C. The larva of mosquito, feeds on microorganisms.
 - D. None of the above

06. A Parasitic Plant with Yellow, Slender and Tubular Stem
- A. Cuscuta
 - B. Pitcher plant
 - C. Golden roads
 - D. All the above
07. In Non-Green Plants and Animals, their mode of Nutrition is
- A. Saprophytic
 - B. Parasitic
 - C. Heterotrophic
 - D. Autotrophic
08. The term that is used for the mode of Nutrition in Yeast, Mushrooms and Bread

Mould is:

- A. Autotrophic
 - B. Insectivorous
 - C. Saprophytic
 - D. Parasitic
09. Pitcher plant traps insect because it
- A. is a heterotroph.
 - B. grows in soils which lack in nitrogen.
 - C. does not have chlorophyll.
 - D. has a digestive system like human beings.
10. Human beings get food from
- A. Plants
 - B. Animals
 - C. neither (a) or (b)
 - D. both (a) and (b)

Filling the blanks (Completion items)

1. Green plants are called _____ since they synthesise their own food.
2. The food synthesised by the plants is stored as _____.
3. In photosynthesis solar energy is captured by the pigment called _____.

4. During photosynthesis plants take in _____ and release _____.
5. _____ traps insects because it grows in soils which lack in nitrogen.
6. _____ are the association of an autotroph and a heterotroph.
7. Carbon dioxide + Water + (Sunlight and Chlorophyll) → Carbohydrates + _____.
8. _____ is a parasite.
9. Algae and Fungi are _____ organisms which prepare food for themselves using simple naturally available raw.
10. Materials are referred to as _____

True or false

1. A Parasitic plant with Yellow, Slender and Tubular Stem is called Cuscuta. (T/F)
2. In Non-Green plants and Animals, their mode of Nutrition is heterotrophic. (T/F)
3. Pitcher plant traps insect because it grows in soils which lack in nitrogen. (T/F)
4. Lichens are the association of an autotroph and a saprotroph. (T/F)
5. When we observe the lower surface of a leaf through a magnifying lens, we see numerous small openings called as Lamina. (T/F)
6. Farmers do not apply nitrogenous fertilizers in the cultivation of pulses plant because pulses plant derive nutrition from the symbiotic association. (T/F)
7. Photosynthesis requires chlorophyll and a few other raw materials as H₂O, Solar energy, CO₂ and oxygen. (T/F)
8. Fungus is a Parasite. (T/F)
9. A Greenhouse is built of any material through which sunlight can't pass. (T/F)
10. Organisms which prepare food for themselves using simple naturally available raw materials are referred to as heterotrophs. (T/F)

4. CONTROL GROUP

STUDENTS	ACHIEVEMENT SCORE
Student-1	17
Student-2	14
Student-3	15
Student-4	16
Student-5	18
Student-6	26
Student-7	21
Student-8	22
Student-9	22
Student-10	18
Student-11	27
Student-12	27
Student-13	18
Student-14	19
Student-15	17
Student-16	16
Student-17	19
Student-18	14
Student-19	20
Student-20	22
Student-21	20
Student-22	21
Student-23	24
Student-24	16

5. EXPERIMENTAL GROUP

STUDENTS	ACHIEVEMENT SCORE
Student-1	29
Student-2	27
Student-3	28
Student-4	26
Student-5	25
Student-6	21
Student-7	25
Student-8	19
Student-9	25
Student-10	24
Student-11	25
Student-12	24
Student-13	23
Student-14	25
Student-15	26
Student-16	24
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Student-20	23
Student-21	26
Student-22	19
Student-23	21
Student-24	26