GURU GOBIND SINGH PUBLIC SCHOOL

BIOLOGY ASSIGNMENT CLASS: 8

Microorganisms:
Study materials: Harmful microorganisms, Food preservation and Nitrogen cycle

HARMFUL MICROORGANISMS

Some microorganisms are harmful for us. They can cause diseases and can also spoil our food, clothes, etc.

►Disease causing microorganism in animals and plants

Microorganisms can cause diseases in both plants and animals. Some animal and plant diseases and their agents are listed in the table given below:

Animal diseases and causative agent	
Disease	**Causative agent**
1. Foot-and-mouth disease in cattle	Virus
2. Anthrax disease in cattle	Bacterium
3. Sleeping sickness in cattle, pigs and horses	Protozoa
Plant diseases and causative agent	
Disease	**Causative agent**
1. Potato blight	Virus
2. Tobacco mosaic	Virus
3. Rust of wheat	Fungi
4. Citrus canker	Bacterium
5. Yellow vein mosaic of okra	Virus

►Disease-causing microorganisms in humans

Pathogens cause diseases in humans. These diseases are called communicable diseases, as they can spread from one person to another. Pathogens enter the human body through the air we breathe, food we eat, water we drink, through direct

contact with a sick person or through carriers like insects.

►Direct transmission

(i) By direct contact
(ii) By droplet infection
(iii) By using an infected needle or syringe

Rust of wheat

Potato blight

►Indirect transmission

Modes of indirect transmission are through infected food and water, through clothes, towels or personal belongings of a patient or through dirty hands or unwashed fruits and vegetables.

►Spread of diseases by insects

Insects like mosquitoes and houseflies are the carriers of microorganisms.

Mosquitoes can act as a **vector** for many disease-causing viruses and parasites. For example: **Malaria** is spread by the female Anopheles mosquito. It is caused by the protozoan Plasmodium. **Houseflies** also carry harmful microbes from one place to another.

Stagnant water

Anopheles mosquito

FOOD PRESERVATION

Food gets spoilt when it is attacked by microorganisms. Spoiled food gives off foul smell and tastes bad. Sometimes its color may even change. Eating spoiled food can cause **food poisoning**. Food poisoning can cause vomiting, diarrhea and abdominal pain.

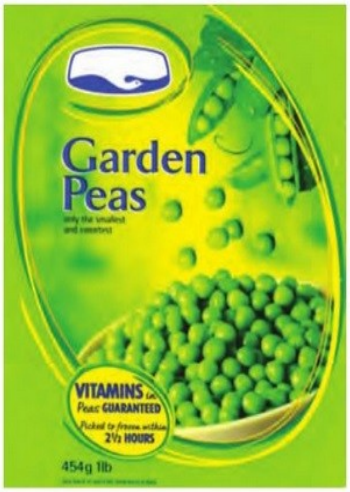
Microorganisms require air, water and warmth for growth. Food can be prevented from getting spoilt by preventing the growth of microorganisms.

►Methods of food preservation

- Drying (dehydration)
- Freezing or Refrigeration
- Pasteurization
- Salting and adding sugars
- By use of chemicals
- Canning
- By vacuum packing

►Advantages of food preservation

- It reduces the wastage of food by avoiding its spoilage.
- It helps to retain the nutritive value of food to a great extent.
- It ensures the food availability during off-season and at distant places.
- It increases the shelf life of perishable food items.



Preserved peas packet


Refrigerator

Preserved pickle and jam

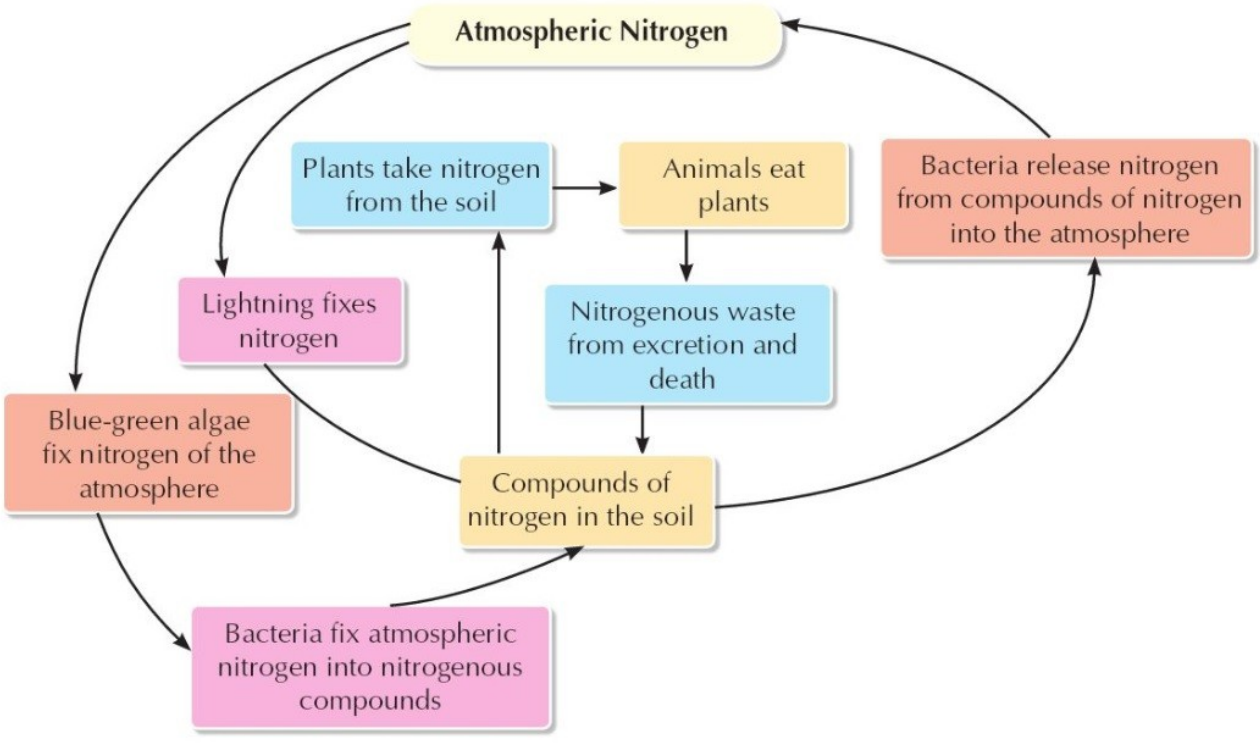
NITROGEN CYCLE

The cyclic process by which nitrogen is fixed, used by plants and animals and then returned to the atmosphere is called **nitrogen cycle**.

Important processes in the nitrogen cycle include nitrogen fixation, nitrogen assimilation, ammonification, nitrification and denitrification.

The atmosphere of earth contains approximately **78% nitrogen**. However, this atmospheric nitrogen has limited availability for biological use, leading to a scarcity of usable nitrogen. This atmospheric nitrogen must be processed or fixed to be used by plants.

The conversion of atmospheric nitrogen into a form which is readily available to plants is called **nitrogen fixation**. It is an important step in the nitrogen cycle, for supply of this essential nutrient.



Nitrogen cycle in nature

►By symbiotic bacteria (Biological Nitrogen Fixation)

Leguminous plants like peas and beans have a bacterium called Rhizobium in their root nodules. The bacterium can take up atmospheric nitrogen and converts it into nitrates. Nitrates get mixed up with the soil after decay of plants.

►During lightning (Atmospheric Nitrogen Fixation)

● When lightning occurs, the nitrogen and oxygen in the air react to form **oxides of nitrogen**.

● These compounds fall down to the earth with rainwater as nitric acid.

● The nitric acid reacts with soil **alkaline** such as limestone to form nitrates which are absorbed by the plants through their roots.

► ASSIGNMENT:

1. Who discovered penicillin?

2. Name a bacterium which causes food poisoning.

3. What are vaccines?

4. What are antibiotics?

5. How do insects act as a carrier of diseases? Explain giving examples.

RANJANA BHARTI