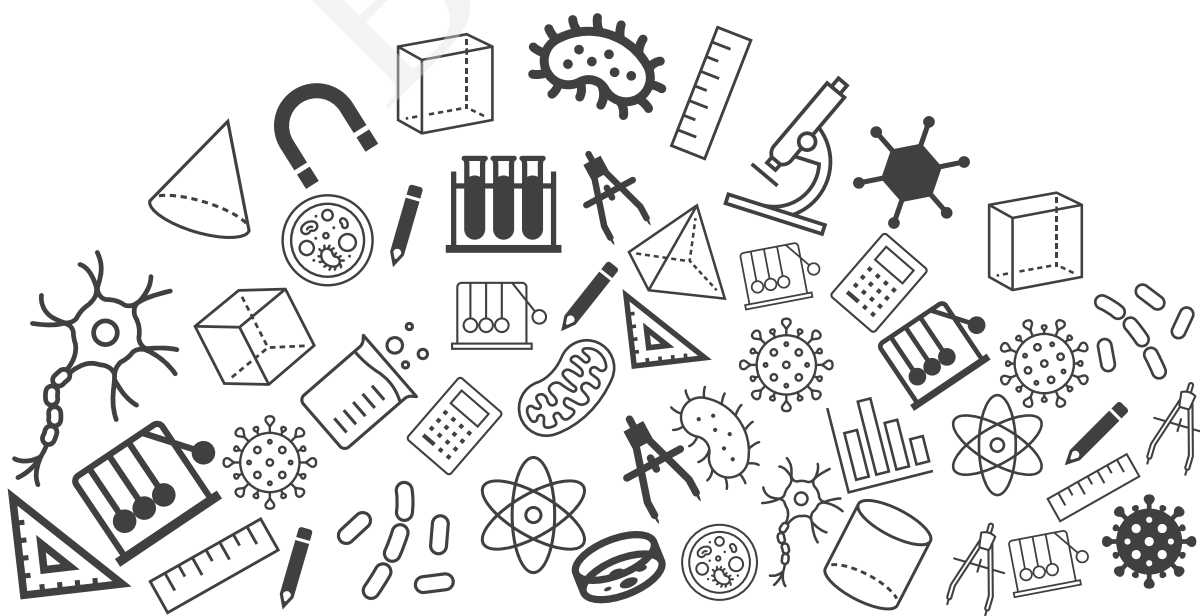




Grade 08

Chapter Notes



BYJU'S
CHAPTER NOTES

Microorganisms: Friend and Foe



Topics to be covered



1 Microorganisms

- 1.1 Types of Microorganisms
- 1.2 Where do Microorganisms Live?

2 Beneficial Microorganisms

- 2.1 In the Food Industry
- 2.2 In the Environment
- 2.3 In the Medical Industry

3 Harmful Organisms

- 3.1 Diseases in Humans
- 3.2 Diseases in Plants
- 3.3 Diseases in Animals

4 Food Preservation

- 4.1 Need for Preservation
- 4.2 Methods of Preservation

1. Microorganisms

Definition

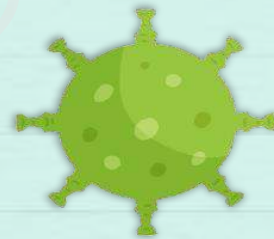
- A group of tiny organisms that are visible only under a microscope.
- Microorganisms are of different types such as virus, bacteria, fungi, protozoa, and some algae.

1.1 Types of microorganism

Bacteria



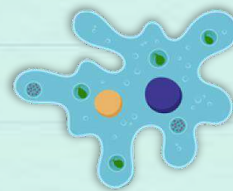
Virus



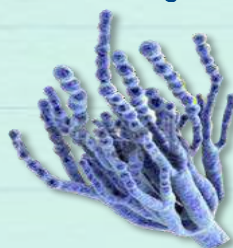
Algae



Protozoa



Fungi



1. Microorganisms

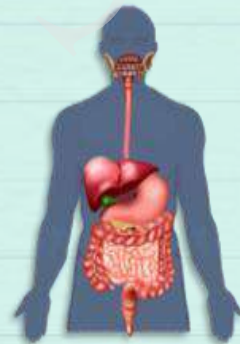
1.2 Where do microorganisms live?

They live in all types of environments, ranging from ice-cold climates to hot springs; and deserts to water bodies. They are also found inside the bodies of animals including humans.

Water bodies



Human digestive system



Extreme conditions



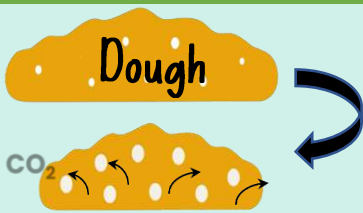
2. Beneficial Microorganism

2.1 In the Food Industry

Fermentation

Process of conversion of sugar into alcohol along with release of carbon dioxide by yeast in the absence of oxygen

Bread making



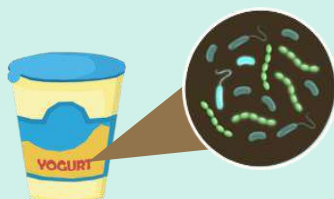
- Yeast is needed in the bread making. It feeds on the sugar present in the dough to release alcohol and carbon dioxide
- The presence of carbon dioxide in the dough gives the bread its fluffy texture.

Wine making



- Yeast is also needed for the fermentation of grapes to prepare wine.
- The sugar is broken down to form alcohol and carbon dioxide. This alcohol is processed to produce wine.

Curd making



- *Lactobacillus* helps in the preparation of curd by fermenting milk.
- The sugar molecules of milk is broken down into lactic acid. The lactic acid in the milk leads to the formation of curd.

2. Useful microorganisms

2.2 In the Environment

Nutrient Replenishment in soil



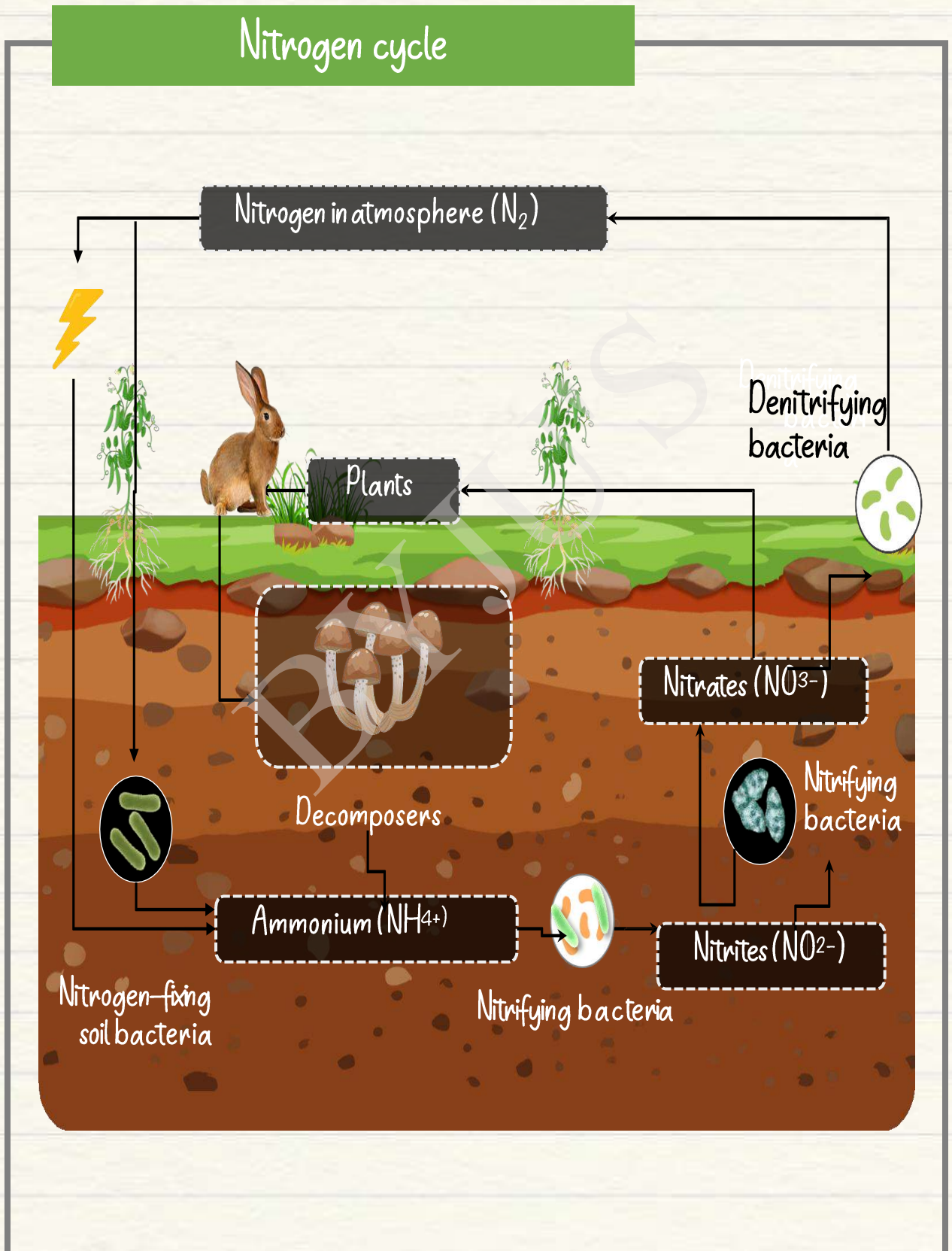
Some bacteria are able to fix nitrogen from the atmosphere in the soil. This enriches the soil with nitrogen and increases its fertility. These microbes are commonly called biological nitrogen fixers.

Decomposition



The microorganisms decompose dead organic waste of plants and animals, converting them into simple substances. Thus, it helps in keeping the environment clean.

2. Useful microorganisms



2. Useful microorganisms

2.3 In the Medical Industry

Vaccines

- Made up of dead or weakened microbes
- Provides immunity to our body
- Can be injected or given through drops
- Edward Jenner first discovered the vaccine in 1798 for smallpox.
- He used the cowpox virus for the vaccine



Edward Jenner

Antibiotics

- Chemical substances produced by microbes to kill other microbes
- Streptomycin, tetracycline, and erythromycin are some examples of antibiotics.






3. Harmful Microorganism

Pathogens

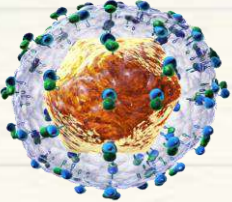
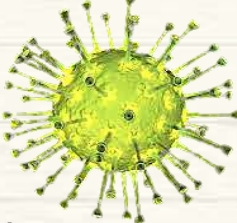
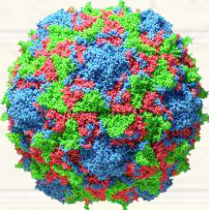
Some of the microorganisms cause diseases in human beings, plants and animals. Such disease-causing microorganisms are called pathogens.

3.1 Bacterial Diseases in Humans

Disease	Mode of transmission	Pathogens
Tuberculosis	Contaminated air droplets	 <i>Mycobacterium tuberculosis</i>
Typhoid	Contaminated water or food	 <i>Salmonella typhi</i>
Cholera	Contaminated water or food	 <i>Vibrio cholerae</i>




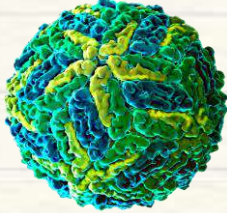
3. Harmful Microorganism

3.2 Viral Diseases in Humans

Disease	Mode of transmission	Pathogens
Hepatitis A	Contaminated water or food	 <p>Hepatitis A virus</p>
Chickenpox	Contaminated air or direct contact	 <p>Varicella-zoster virus</p>
Polio	Contaminated air or water	 <p>Poliovirus</p>

3. Harmful Microorganism

3.3 Vector-borne Diseases in Humans

Disease	Mode of transmission	Pathogens
Malaria	 Female <i>Anopheles</i>	 <i>Plasmodium</i>
Dengue	 Female <i>Aedes</i>	 Dengue virus

3. Harmful Microorganism

3.4 Diseases in Animals

Disease

Foot and Mouth Disease (FMD)



Causal Agent and Symptoms

- Transmitted through direct contact and contaminated air droplets
- Caused by *Aphthovirus*
- Symptoms include:
 - i. Lesions
 - ii. Painful blisters
 - iii. Excessive salivation

Disease

Anthrax






Causal Agent and Symptoms

- Transmitted through contaminated soil, food, and water
- Caused by *Bacillus anthracis*
- Symptoms include:
 - i. Difficulty in breathing
 - ii. Convulsions
 - iii. Fever

3. Harmful Microorganism

3.5 Diseases causing microbes in Plants

Disease	Mode of transmission	Pathogens
 <p>Citrus canker</p>	<p>Air</p>	<p>Bacteria <i>Xanthomonas axonopodis</i></p>
 <p>Wheat rust</p>	<p>Air, seeds</p>	<p>Fungi <i>Puccinia rust fungus</i></p>
 <p>Yellow vein mosaic</p>	<p>Insects</p>	<p>Virus <i>Yellow vein mosaic virus</i></p>

4. Food Preservation

4.1 Need for Preservation

- Microorganisms spoil food by releasing toxic substances. Consuming such food leads to food poisoning.
- For example: *E.coli* enters the body through vegetables and fruits contaminated by sewage water.
- Spoiled food emits bad smell and has a bad taste and changed colour.

Symptoms of Food Poisoning



Abdominal
cramps



Nausea



Fever



Vomiting



Diarrhoea

4. Food Preservation

4.2 Methods of Preservation

Vacuum Packing



- Foods are stored in packets from which air is removed.
- The removal of air prevents the growth of microorganism.

Pasteurisation



- Milk is heated to a certain temperature to kill microbes.
- It is then quickly cooled at a low temperature to prevent further growth of microbes.

Addition of Chemical Preservatives



- Sodium benzoate and sodium metabisulphite are commonly used chemical preservatives.

Salt and Sugar



- Meat and fish are preserved by curing them with salt.
- Jam and jellies are preserved by sugar.
- Both inhibit the growth of microorganisms.



Mind Map

Need

Methods

Food Preservation

Microorganisms:
Friend and Foe

Useful
Microorganism

Harmful
Microorganism

Food

Medicine

Environment

Humans

Animals

Plants