

# Human and Harmful Microbes

## I. Types of Microbes

1. Bacteria: single-celled, prokaryotic organisms
2. Viruses: small, non-cellular particles
3. Fungi: eukaryotic organisms
4. Protozoa: single-celled, eukaryotic organisms

## II. Harmful Microbes

1. Pathogens: disease-causing microbes
2. Bacterial pathogens: tuberculosis, pneumonia
3. Viral pathogens: influenza, HIV
4. Fungal pathogens: athlete's foot, ringworm
5. Protozoan pathogens: malaria, giardiasis

### III. Human-Microbe Interactions

1. Symbiotic relationships: mutualism, commensalism, parasitism
2. Microbiome: collection of microbes living within/around humans
3. Benefits of microbiome: immune system development, digestion, skin health

## IV. Diseases Caused by Microbes

1. Infectious diseases: common cold, flu, tuberculosis
2. Non-infectious diseases: cancer, heart disease
3. Emerging diseases: Ebola, Zika

## V. Prevention and Treatment

1. Vaccination
2. Antibiotics
3. Antivirals
4. Antifungals
5. Personal hygiene

## **VI. Microbe-Related Careers**

1. Microbiologist
2. Epidemiologist
3. Immunologist
4. Public health specialist

## Key Terms

1. Microbe
2. Pathogen
3. Symbiosis
4. Microbiome
5. Vaccination



## Discussion Questions

1. What are the different types of microbes?
2. How do harmful microbes cause disease?
3. What is the role of microbiome in human health?
4. How can we prevent microbe-related diseases?
5. What are the different careers related to microbes?



## Activities

1. Research a specific microbe
2. Create a diagram illustrating microbe-human interactions
3. Debate: "Should antibiotics be used to treat viral infections?"
4. Write a persuasive essay on vaccine importance
5. Develop a public health campaign promoting microbiome awareness