



Primary 5 Integrated Science

Term 2

Theme: THE WORLD OF LIVING THINGS

Topic 4/4 – Bacteria and Fungi

Learning outcome The learner is able to use scientific knowledge and skills about bacteria and fungi as disease agents and how they can be used to solve problems of everyday experiences.

Bacteria



Bacteria are **tiny living organisms** that can only be seen under a microscope.

They are among the smallest forms of life and can be found almost everywhere.

They have different shapes and forms

Characteristics of bacteria

- (i) They are microscopic
- (ii) They are single celled
- (iii) Have different shapes and forms
- (iv) Reproduce by binary fission (by splitting into two)

Places where bacteria are found

- (i) In the **air, water, and soil**.
- (ii) On **plants and animals**.
- (iii) Inside the **human body** (for example, in the stomach and skin).
- (iv) Even in extreme places like hot springs and ice.

Places where bacteria breed (Multiply)

Bacteria breed best in **warm, moist, and nutrient-rich environments**.

Examples:

- Spoiled food
- Dirty water
- Wounds on the body
- Damp places like bathrooms

Exercise 1

Mention one place where bacteria breed.

Nature of bacteria

Some bacteria are harmful while others are useful.

Useful Bacteria

- (i) Help in **digestion** (some live in our intestines and aid in breaking down food).
- (ii) Used in **food production** (e.g., making yogurt, cheese, vinegar).
- (iii) Improve **soil fertility** by fixing nitrogen, which helps crops grow.
- (iv) Used to make **medicine** (some bacteria produce antibiotics).

Harmful Bacteria

- (i) Cause **diseases** in humans, animals, and plants (e.g., tuberculosis, cholera, typhoid).
- (ii) Lead to **food spoilage** when they grow in stored crops or cooked food.
- (iii) Produce **toxins** that can make people sick.

Exercise 2

- (i) State two benefits and two dangers of bacteria

Prevention of bacterial diseases

- (i) **Good hygiene:** Regular handwashing, safe food handling, and clean water reduce the spread of bacteria.
- (ii) **Vaccination:** Some bacterial diseases (like tuberculosis, diphtheria, tetanus) can be prevented with vaccines.
- (iii) **Safe practices:** Avoiding contact with infected individuals, practicing safe sex, and using protective equipment in healthcare settings.
- (iv) **Environmental sanitation:** Proper waste disposal and clean surroundings limit breeding grounds for harmful bacteria.

Control of bacterial disease

- (i) **Surveillance:** Monitoring outbreaks helps detect and respond quickly.
- (ii) **Quarantine and isolation:** Keeping infected individuals separate prevents spread.
- (iii) **Public health measures:** Education campaigns, safe food storage, and clean water supply reduce risks.
- (iv) **Antibiotic stewardship:** Careful use of antibiotics prevents resistance and keeps them effective.

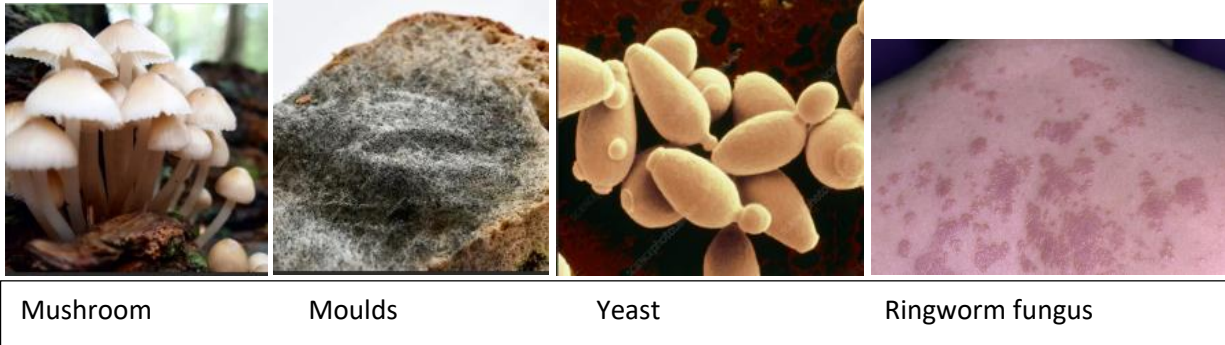
Treatment of bacterial diseases

- (i) **Antibiotics:** The main treatment for bacterial infections, prescribed according to the type of bacteria.
- (ii) **Supportive care:** Rest, fluids, and nutrition help the body recover.
- (iii) **Surgery or drainage:** In severe cases, infected tissue or abscesses may need removal.
- (iv) **Hospital care:** For serious infections like sepsis, patients may require intensive treatment.

Exercise 3

- (i) Give one way bacterial diseases can be controlled

Fungi



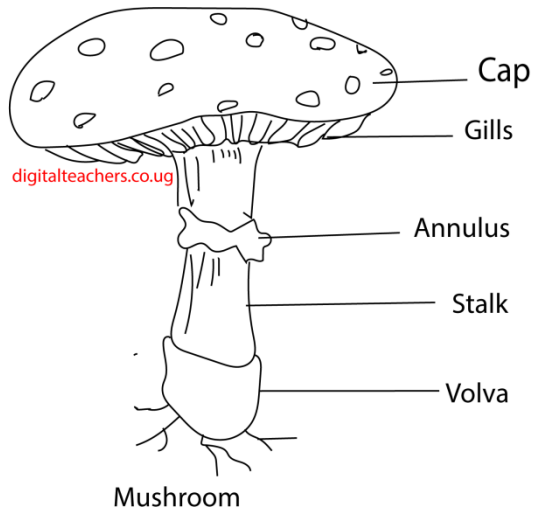
- (i) Fungi are **living organisms** that are not plants or animals.
- (ii) They do not make their food unlike plants
- (iii) They reproduce by spores

Examples

- (i) **Mushrooms** – edible fungi often grown for food.
- (ii) **Yeast** – used in baking bread and brewing beer.
- (iii) **Molds** – grow on spoiled food like bread, fruits, and vegetables.
- (iv) **Penicillium** – a mold used to make antibiotics (like penicillin) and some cheeses.
- (v) **Ringworm fungus**

Places where fungi are found

- (i) In **damp and warm places** such as soil, rotting wood, and decaying leaves.
- (ii) On **spoiled food** like bread, fruits, and vegetables.
- (iii) In the **air** as tiny spores.
- (iv) On or inside **plants, animals, and humans** (some cause infections).



- Cap protects the gills
- Gills produce spores
- Spores are reproductive cells
- Stalk support the cap.

Benefits of fungi

- (i) Decompose and recycle organic matter
- (ii) Production of antibiotics e.g. penicillin
- (iii) Production of alcohols
- (iv) Baking e.g. yeast

Dangers/Disadvantages of fungi

- (i) Cause diseases e.g. ringworm and meningitis



(ii) Food decay

Example fungal disease in plants



Anthracnose



Rots



Mildews



Rusts

Example of fungal diseases to animals



Athletic foot



Oral thrush

Exercise 5

- (i) State two benefits and two dangers of bacteria

Prevention and control of diseases caused by fungi.

Fungal diseases can affect humans, animals, and crops, but they can be managed through **prevention and control measures.**

Prevention of fungal diseases

- (i) **Maintain hygiene:** Keep skin clean and dry to prevent infections like athlete's foot.
- (ii) **Proper food storage:** Store grains and fruits in dry conditions to avoid mold growth.
- (iii) **Avoid sharing personal items:** Towels, shoes, and combs can spread fungal infections.
- (iv) **Vaccination and resistant varieties:** In agriculture, planting resistant crop varieties helps prevent fungal diseases.
- (v) **Environmental sanitation:** Reduce dampness and overcrowding, which encourage fungal growth.

Control of fungal diseases

- (i) **Early detection:** Identify fungal infections quickly to stop them from spreading.
- (ii) **Isolation:** In humans, infected individuals may need to avoid close contact until treated.
- (iii) **Crop rotation and field management:** Farmers rotate crops and remove infected plants to control spread.
- (iv) **Use of fungicides:** In agriculture, fungicides are applied to protect crops from fungal attacks.
- (v) **Public health education:** Teaching communities about fungal risks helps reduce outbreaks.

Treatment of fungal diseases

- (i) **Antifungal medicines:** Creams, tablets, or injections are used to treat human fungal infections.
- (ii) **Topical applications:** Skin infections are often treated with antifungal creams or ointments.
- (iii) **Systemic antifungals:** For severe infections (like in the lungs), stronger medicines are prescribed.
- (iv) **Agricultural fungicides:** Farmers use chemical or biological fungicides to treat crops.

Exercise 6

- (i) Mention two ways of minimizing fungal infections

Revision questions

1. Give any one way that can be used to prevent the spread of tuberculosis in a community.
 - (i) **Early diagnosis and treatment:** Ensure that people with TB are tested and treated promptly to stop transmission.
 - (ii) **Covering mouth and nose:** Encourage patients to cover their mouth when coughing or sneezing to reduce bacteria spread.
 - (iii) **Good ventilation:** Keep homes, schools, and workplaces well-ventilated since TB spreads more easily in crowded, poorly ventilated areas.
 - (iv) **BCG vaccination:** Give children the Bacillus Calmette–Guérin (BCG) vaccine to protect them against severe forms of TB.
 - (v) **Avoid overcrowding:** Reduce crowding in living spaces to limit close contact.
 - (vi) **Public health education:** Teach communities about TB symptoms, transmission, and the importance of completing treatment.
 - (vii) **Isolation of infectious patients:** In serious cases, patients may need to be isolated until they are no longer infectious.
2. Give one characteristic of bacteria
 - (i) They are microscopic
 - (ii) They are single celled
 - (iii) Have different shapes and forms
 - (iv) Reproduce by binary fission (by splitting into two)
3. Give one reason why we should regularly wash our hands with soap and water
 - (i) **Removes germs** – Soap and water wash away bacteria, viruses, and fungi that can cause diseases.
 - (ii) **Prevents infections** – Stops the spread of illnesses like diarrhea, cholera, flu, and COVID-19.

- (iii) **Protects others** – Clean hands prevent passing germs to family, friends, and the community.
- (iv) **Keeps food safe** – Washing hands before cooking or eating prevents food contamination.
- (v) **Promotes hygiene** – Regular handwashing keeps the body clean and reduces bad odors.
- (vi) **Reduces absenteeism** – In schools and workplaces, fewer people fall sick when handwashing is practiced.

4. (a) Name the germ that cause cholera

Bacteria/ *Vibrio cholerae*

(b) Explain why cholera is common in heavily populated communities

- (i) **Poor sanitation** – In crowded places, waste disposal is often not well managed, leading to contamination of water sources.
- (ii) **Unsafe drinking water** – Many people may share the same water supply, which can easily get polluted with germs like *Vibrio cholerae*.
- (iii) **Overcrowding** – When too many people live close together, diseases spread faster from one person to another.
- (iv) **Limited hygiene facilities** – Few toilets and washing areas mean germs spread more easily.
- (v) **Food contamination** – Street food or shared meals can get contaminated if prepared with dirty water or in unhygienic conditions.

(c) Apart from proper use of latrines, mention any one other way of controlling the spread of cholera in the community in (b) above.

- (i) **Boil or treat drinking water** before use to kill germs.
- (ii) **Wash hands with soap and clean water** after using the toilet and before eating.
- (iii) **Keep food covered and eat it while still hot** to prevent contamination.
- (iv) **Dispose of rubbish properly** to avoid attracting flies that can spread germs.
- (v) **Clean the surroundings regularly**

5. The diagram below shows a person wearing a protective item made of cloth. Use it to answer the following questions.



- (a) Name the protective item labelled K
Face mask
- (b) Identify any two diseases that can be prevented by the use of the protective Item K.
flu, tuberculosis, and COVID-19.
- (c) Mention any one good practice of using the protective Item k
- Cover both the nose and mouth properly without leaving gaps.
 - Washing hands before putting on or removing the mask.
 - Avoiding touching the front of the mask while wearing it.
 - Using a clean mask and replacing it when dirty or wet.
6. State any way of controlling the spread of ring worm among children.
- (i) **Maintain good personal hygiene** – children should bathe regularly and keep their skin clean.
- (ii) **Avoid sharing personal items** – such as towels, clothes, combs, or bedding.
- (iii) **Keep fingernails short and clean** – to reduce scratching and spreading the fungus.
- (iv) **Wash clothes and bedding in hot water** – to kill the fungus.

- (v) **Treat infected children promptly** – with antifungal medicine as advised by a health worker.
- (vi) **Keep pets clean and check them for infections** – since animals can also spread ringworm.

7. State one condition that favor multiplication of bacteria.

- (i) **Moisture (water):** Bacteria need water to grow and survive.
- (ii) **Warm temperature:** Most disease-causing bacteria grow best at moderate warmth (around human body temperature).
- (iii) **Nutrients (food):** They multiply faster when there is enough food like sugars and proteins.
- (iv) **Suitable pH:** Many bacteria prefer a neutral or slightly acidic environment.
- (v) **Oxygen availability:** Some bacteria need oxygen (aerobic), while others grow without oxygen (anaerobic).

8. Name one way of preventing diseases that are spread by fingers.

- Washing hands regularly with soap and water
- Proper hygiene

9. Name the human respiratory disease whose signs are loss of weight, chronic cough and blood stained sputum

Tuberculosis

10. Apart from causing diseases, give one other way in which fungi are harmful to people?

Food spoilage: Molds grow on bread, fruits, and other foods, making them unsafe to eat.

11. Name the vaccine which is given to prevent three childhood immunizable diseases.

DPT stands for **Diphtheria, Pertussis (whooping cough), and Tetanus.**

12. The table below shows some common infection, organisms that cause it and the body part affected. Study and complete it correctly.

Common infections	Organism that cause it	Body parts affected
<u>Trachoma</u>	Chlamydia	Eyes
Tuberculosis	bacteria	<u>lungs</u>
<u>Polio</u>	Virus	Muscle and bones
Ringworm	<u>fungi</u>	Skin

13. (a) Name any one organism that makes fresh meat go bad.

Bacteria, fungi

(b) State any three ways of preventing fresh meat from going bad

- (i) **Keep meat in a refrigerator or freezer** – cold temperatures slow down bacterial growth.
- (ii) **Salt or dry the meat** – salting draws out moisture, making it harder for germs to grow.
- (iii) **Smoke the meat** – smoking preserves meat by drying it and adding protective chemicals.
- (iv) **Cook meat thoroughly** – cooking kills bacteria and makes meat safe to eat.
- (v) **Store meat in clean containers** – to avoid contamination from dirt or flies.

14. Apart from pasteurizing, give any one way milk can be prevented from going bad.

- (i) **Keeping milk in a refrigerator or cool place** – cold slows down bacterial growth.
- (ii) **Adding preservatives like pasteurization** – treating milk to make it last longer.
- (iii) **Storing milk in clean, covered containers** – prevents contamination from dirt or flies.
- (iv) **Avoiding leaving milk in the sun or warm places** – heat makes it spoil quickly.

15. Which communicable disease in human affects both the skins and the skeletal system?

Tuberculosis

Thank You

Dr. Bbosa Science