General Characteristics of Bacteria

1. Cellular Organization

Bacteria are prokaryotic - they lack a true nucleus and membrane-bound organelles. The genetic material (DNA) lies in the nucleoid region.

2. Size and Shape

Bacteria are very small (0.2-2 um). Common shapes include:

- Cocci (spherical) e.g., Streptococcus
- Bacilli (rod-shaped) e.g., Bacillus subtilis
- Spirilla (spiral-shaped) e.g., Spirillum volutans
- Vibrios (comma-shaped) e.g., Vibrio cholerae

3. Cell Wall

Most bacteria have a rigid cell wall made of peptidoglycan, providing shape and protection. They are classified as:

- Gram-positive (thick wall)
- Gram-negative (thin wall + outer membrane).

4. Cell Structure

A typical bacterial cell includes: Cell wall, Plasma membrane, Cytoplasm, Ribosomes, Nucleoid, Plasmids, Flagella, and Pili/Fimbriae.

5. Habitat

Bacteria are ubiquitous - found in soil, water, air, and inside other organisms. Some live in extreme conditions.

6. Mode of Nutrition

They show diverse nutrition types:

- Autotrophic (photosynthetic/chemosynthetic)
- Heterotrophic (saprophytic, parasitic, symbiotic).

7. Respiration

General Characteristics of Bacteria

Bacteria may be:

- Aerobic (need oxygen)
- Anaerobic (no oxygen)
- Facultative (either way).

8. Reproduction

Mainly asexual by binary fission. Genetic recombination occurs via conjugation, transformation, or transduction.

9. Importance

Beneficial: decomposition, nitrogen fixation, food & medicine production.

Harmful: cause diseases like cholera, TB, and typhoid.

Summary Table

Feature	Description
Type	Prokaryotic, unicellular
Cell wall	Made of peptidoglycan
Shape	Cocci, Bacilli, Spirilla, Vibrios
Nutrition	Autotrophic or Heterotrophic
Respiration	Aerobic or Anaerobic
Reproduction	Asexual (Binary fission)
Habitat	Ubiquitous (found everywhere)