Making Water Fit for Use

Why is Water Important?

Water is called the "universal solvent" because it can dissolve most substances. The water we get from rain, wells, rivers, and streams is not pure. To make it safe for use, it must be cleaned and purified.

Potable Water:

- Potable water is safe for drinking and other household uses.
- It is free from harmful impurities and germs.

Types of Impurities in Water

i. Insoluble Impurities :

These are solid particles that do not dissolve in water. They remain suspended, making the water look muddy or dirty.

Examples:

- Dust
- Fine sand
- Clay
- Rust

ii. Soluble Impurities :

These are substances that dissolve in water and make it impure.

Examples:

- Dissolved gases (carbon dioxide, oxygen)
- Salts (calcium, magnesium)
- Minerals and chemicals

iii. Germs :

Tiny living organisms (microorganisms) that cannot be seen with the naked eye. They can cause harmful diseases.

Examples:

- Bacteria → Causes cholera, typhoid

- Viruses → Causes hepatitis, dysentery

iv. How to Make Water Fit for Use

Filtration: The process of removing insoluble impurities by passing water through a filter.

Filtration methods:

- Cloth or sieve filtration → Removes large impurities.
- Sand and gravel filtration → Removes smaller impurities.

Example:

- Using a water filter at home.

Boiling: Boiling water at 100°C for 10-15 minutes kills germs and makes it safe to drink.

Example:

- Boiling tap water before drinking.

Sedimentation and Decantation:

i. Sedimentation:

- The process of letting insoluble impurities settle at the bottom of the container.

ii. Decantation:

- Gently pouring the clear water into another container, leaving the impurities behind.

Example:

- Letting muddy water settle before using the clean water.

Chlorination: Adding chlorine tablets or bleach to water to kill germs. This is used in large-scale water treatment plants.

Example:

- Chlorinated tap water in cities.

Using Water Purifiers: Modern homes use water purifiers with UV and RO (Reverse Osmosis) technology. RO purifiers remove dissolved salts, while UV filters kill germs.

Example:

- RO water filters used in homes and offices.

Activity: Purifying Dirty Water

Materials Needed:

- Dirty water (water with mud or sand)
- Cotton cloth or coffee filter
- Clear glass or container
- Chlorine tablet (optional)

Instructions:

i. Filtration:

- Pour the dirty water through a cotton cloth or coffee filter into a glass.
- This removes large impurities.

ii. Sedimentation:

- Let the water sit for 10-15 minutes.
- Heavier particles will settle at the bottom.

iii. Decantation:

- Gently pour the clear water into another glass, leaving the impurities behind.

iv. Boiling:

- Boil the clear water for 10-15 minutes to kill germs.

v. Chlorination (optional):

- Add a chlorine tablet to further purify the water.

vi. Observation:

- The water becomes clear and safe for drinking.

Importance of Clean Water

Prevents diseases: Clean water reduces the risk of waterborne diseases.

Keeps us healthy: Drinking pure water improves health and boosts immunity.

Used in daily life:

- Drinking
- Cooking
- Cleaning
- Farming

Conserving water: It is important to save and use water wisely.

Conclusion

Water from natural sources is not always safe to drink. It needs to be purified by filtration, boiling, or chlorination. Clean water is essential for good health and safe daily use!