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THEME: SCIENCE IN HUMAN ACTIVITIES AND OCCUPATIONS

TOPIC : Science at Home and in Our Community

Water

What is water?

- **Water** is a universal solvent.
- **Water** is a liquid substance made of hydrogen and oxygen.

Give two components (gases) that make up water

- Oxygen
- Hydrogen

Name the lightest gas

- Hydrogen

What name is given to solid water?

- Ice/snow

What name is given to gaseous water?

- Vapour/steam

Name any four natural sources of water.

- Rain
- Lake
- River
- springs
- Swamps
- Oceans
- Seas

Give two artificial sources of water.

- Dams
- Boreholes
- Wells
- Tanks
- Ponds

Name the main natural source of water in the environment

- Rain

What is Pure water?

- This is water without impurities.

Give four properties of pure water

- Pure water is tasteless/ Pure water has no taste
- Pure water is colourless/ Pure water has no colour
- Pure water is odourless/ Pure water has no smell
- Pure water boils at $100^{o}C$/ $212^{o}F$
- Pure water freezes at $0^{o}C/32^{o}F$
- Pure water has no impurities
- Forms lather easily with soap

Give two types of water.

- Hard water
- Soft water

What is hard water

- This is the type of water that doesn't easily form lather with soap.
- This is water with high mineral content.

Name examples of hard water

- Ocean water
- Seawater
- Borehole water
- Water from lakes and rivers
- Muddy water

Give two ways of making hard water soft

- By distilling it
- By boiling it/ heating it
- By adding calcium bi-carbonate in hard water

State two disadvantages of using hard water to wash clothes.

- Hard water wastes soap.

- Hard water makes washing difficult.
- Hard water leaves stains/mineral deposits on clothes.

What is soft water?

- This is the type of water that easily forms lather with soap.
- This is the type of water with a low mineral content.

Name two examples of soft water

- Distilled water
- Rain water
- Boiled water
- Spring water

Give two advantages of using soft water to wash clothes.

- Soft water doesn't waste soap.
- Soft water removes stains from clothes.

Give any three domestic uses of water to people at home

- For drinking
- For cooking
- For washing clothes, utensils, cars and hands.
- For flushing toilets
- For bathing
- For mopping
- For irrigation
- For swimming

Why is borehole water safe for drinking?

- It can't easily be contaminated.
- It is free from germs/pathogens.

Write down any two uses of water in our bodies

- Water dissolves nutrients and mineral salts.
- Water lubricates joints.
- Water forms blood plasma.
- Water cleanses the body

- Water regulates body temperature.
- Water maintains the shape of body cells
- Water transports nutrients and oxygen in the body.
- Water is a medium of chemical reactions in the body.
- Water eases digestion of food
- Water increase the volume of blood

Give two industrial uses of water

- For cooling machines
- For washing machines
- For mixing chemicals and drugs.
- For generating hydro-electricity
- For making beverages

State four medical uses of water

- Washing surgical tools
- Mixing drugs
- Making solutions
- Cleaning wounds
- Diluting drugs

What is impure water?

- This is water with impurities in it

Give two characteristics of impure water

- Impure water is dirty
- Impure water smells
- Impure water is tasty
- It has unusual color
- It doesn't foam lather easily with soap

What is water pollution?

- This is the contamination of water sources with harmful substances.
- This is the addition of harmful substances into water sources.

Give any two ways of polluting/contaminating water

- By discharging sewage into water.
- By urinating in water sources
- By defecating in water sources
- By bathing/swimming in water sources
- By silting
- By releasing industrial wastes into water
- By dumping rubbish/garbage into water
- By using dirty containers to harvest water.

What are water pollutants/impurities?

- These are things that make water dirty.
- These are materials that contaminate water

Name four examples of water pollutants/impurities

- Urine
- Faeces
- Bacteria
- Herbicides
- Silt
- Fertilizers
- Dung
- Dust
- Sewage
- Garbage

Give two effects of water pollution

- Leads to death of marine animals
- Leads to outbreak of waterborne diseases.
- Leads to water toxicity.

What are waterborne diseases?

- These are diseases we get when we drink contaminated water.
- These are diseases spread through drinking contaminated water.

Mention four examples of waterborne diseases

- Cholera
- Polio
- Typhoid
- Diarrhea
- Dysentery

Preparation of clean and safe water for drinking and washing.

Give two ways of making water safe for drinking.

- By boiling water
- By treating water.
- By distilling water

Mention two methods of obtaining clean water from muddy water.

- Decantation
- Filtration
- Distillation

Name the commonest method used to prepare safe drinking water.

- Boiling

What is boiling?

- This is the process of heating water to its boiling point.

State the boiling point of water?

- $100^{o}C/212^{o}F$

What is the importance of boiling water for drinking?

- Boiling water helps to kills germs in it.

How does boiling make water safe for drinking?

- Boiling kills germs in water

Why should water be filtered before boiling it?

- To remove sediment.

Why is it advisable to drink boiled water?

- It helps to prevent waterborne diseases.

Why should boiled water be kept in clean and covered containers?

- To prevent recontamination.

Why should we cover the saucepan in which water is being boiled?

- To avoid water from being lost through evaporation.
- To make the water boil quickly

State one way in which boiled water can be recontaminated?

- By putting it in dirty containers

How is boiling different from evaporation?

- Boiling occurs throughout the liquid while evaporation occurs on the surface of the liquid.
- Boiling is a fast/quick process while evaporation is a slow process.
- Boiling takes place at a specific temperature while evaporation takes place at all temperatures

Give the disadvantages of boiling method

- It may lead to burns and scads.
- It leads to cutting down of trees for wood fuel.

What is water treatment?

- Is the process of improving the quality of water to make it usable.

What is chemical water treatment?

- This is the killing of germs in water using chemicals.

Mention examples of chemicals used to treat/kill germs in water

- Chlorine
- Fluorine
- Iodine
- Calcium chloride
- Potassium permanganate
- Chloramine

Give three disadvantages of treating water using chemicals.

- Chemicals are expensive to buy.
- Chemicals add smell to water
- Chemicals add taste to water

- Chemicals add some colour to water/ make it unclear

Reasons for water treatment

- To make water safe for use
- To remove impurities
- To kill germs in water

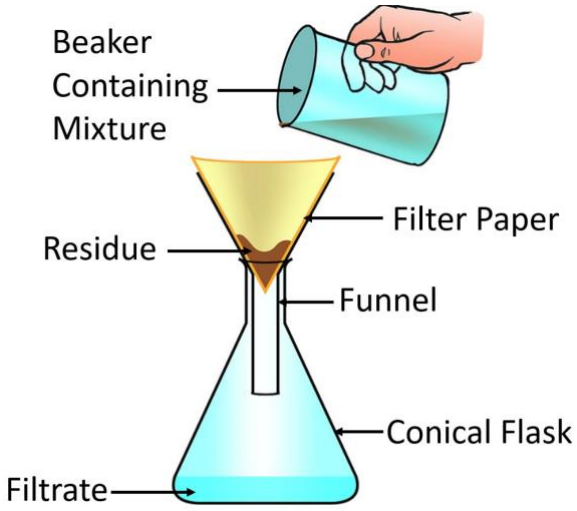
What is chlorination?

- Is the addition of chlorine to water to kill germs.

Filtration

What is filtration?

- This is the separation of solid matter from water using a filter.
- This is the separation of solid particles from water by passing the mixture through a filter.



What are residues (filtrides)

- Residues are solid particles left in the filter after filtration.
- Are solid substances that remain in the filter after filtration.
- Are solid particles trapped by a filter paper during filtration.

What is a filtrate?

- A filtrate is a clear liquid that has passed through a filter.

Application of filtration in our daily life

- Separating seeds from fruit juice

- Separating tea leaves from tea
- Obtaining clear water from muddy water.
- Separating particles from local brew

Materials used for filtration

- Filter paper
- Sieve
- A clean piece of cloth
- Sand
- Leaves/grass

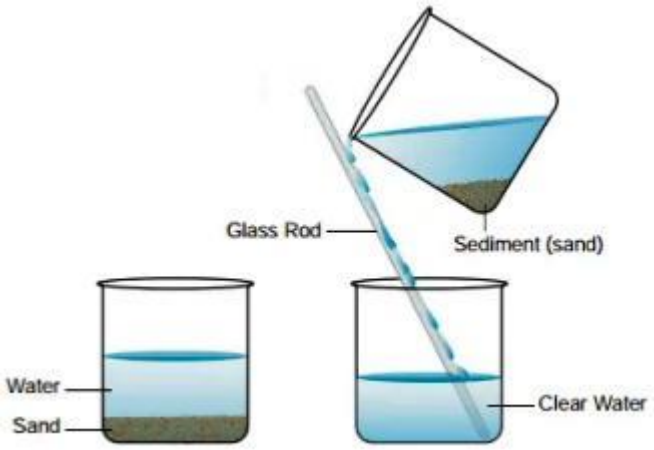
Why is filtered water not good for drinking?

- It may still contain germs.
- The filter can't kill germs.

Decantation

What is decantation?

- This is the process of pouring out a clear liquid from a container without disturbing the sediment at the bottom.
- This is the process of separating clear water from the sediment .
- The clear liquid remain at the top in a container.
- The solid particles settle at the bottom of the container.
- The solid particles that settle at the bottom are called sediment.
- The clear liquid is then poured off into another container without disturbing the sediment



How decantation is used in our daily life

- When separating clear water from muddy water.
- When separating juice from seeds.

Why is water obtained by decantation not good for drinking?

- It may contain germs.
- Decantation doesn't kill germs in water.

Distillation

What is distillation?

- This is the method used to get a pure liquid from an impure liquid by heating it and condensing its vapour.
- This is a method used to separate impurities dissolved in a liquid by heating it and cooling its vapour.
- The impure liquid is heated and its vapour is condensed to get a pure liquid.
- The pure liquid obtained is called a **distillate**.

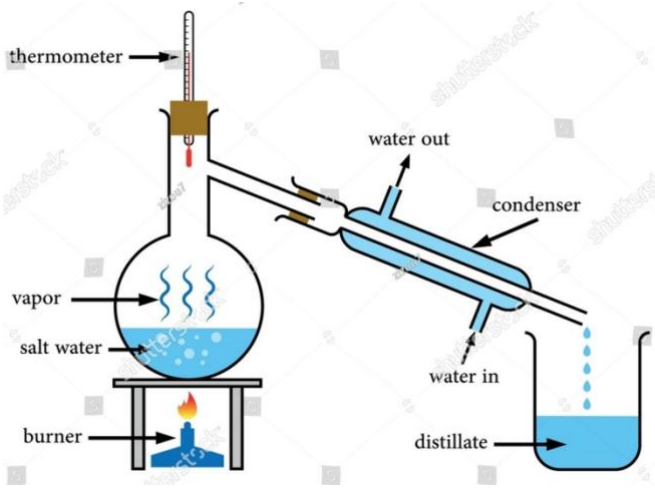
What is a distillate?

- This is a pure liquid obtained through distillation.

Processes involved in distillation

- Evaporation/heating

- Condensation/cooling



The thermometer measures temperature of the vapour

The condenser turns vapour into water.

Why distilled water is not good for drinking?

- It lacks mineral salts/ It lacks electrolytes

Importance of distilled water

- It is used to mix drugs for injection.
- It is used to clean injection sites.
- It is used for wound cleansing.
- It is added to blood in the body through drips.
- It is used to prepare solutions.

Cleaning clothes in a home

Give two importance of clothes

- Keep us warm
- Protect our bodies from injuries.
- Make us look nice

Ways of cleaning clothes

- By washing them
- By ironing them

Name the place where clothes are washed and ironed

- Laundry

Steps used in cleaning clothes.

- Sorting
- Soaking
- Washing
- Rinsing
- Wringing
- Drying
- Ironing

Sorting clothes

- This is the grouping of clothes to be washed.
- This is the putting of clothes to be washed into different categories.

Factors considered when sorting clothes

- Colour
- Type of fabric
- Nature of clothes
- Grade/intensity of dirt
- Purpose/ use of clothes

Reasons for sorting clothes before washing them.

- To prevent dye transfer into other clothes/colour bleeding.
- To protect delicate fabrics/clothes.
- To preserve colour of clothes.
- To prevent less dirty clothes from being soiled.

Soaking clothes

- This is the immersion of clothes in soapy water for sometime before washing.

Importance of soaking clothes

- It helps to soften and loosen dirt/stains

- It helps to dissolve dirt/stains.

Washing clothes

- This is the squeezing of clothes in soapy water to remove dirt or stains from them.

Types of washing

- Hand washing
- Machine washing

Reasons why we wash clothes

- To remove dirt and stains
- To control germs and parasites
- To prevent bad smell/odour

Rinsing

- This is the act of washing clothes in clean water to remove lather from them.

Reasons for rinsing clothes

- To remove lather from clothes
- To remove all the dirt left in clothes.

Wringing

- This is the act of squeezing or twisting clothes to remove water from them.

Reasons for wringing clothes

- To dehydrate clothes
- To remove water from clothes for easy drying.

Drying

- This is the spreading of clothes on a clean surface or clothesline under sunshine for them to dry.

Note: Clothes shouldn't be left to dry completely.

- Clothes should be ironed when they still have some little moisture.

Reason: For easy ironing/It makes ironing easy.

Ironing

- This is the act of pressing clothes with a flatiron to remove creases.

Reasons for ironing clothes

- To remove creases/folds/wrinkles
- To kill germs and parasites

Making local salt from plant materials

- Things needed include
- Tin
- Plant materials
- A jar

Examples of plant materials used

- Banana peelings
- Pods/husks of legumes

Procedures/steps taken

- Collect dry plant materials (banana peelings/stems/ pods/husks of legumes/potato peelings)
- Burn them and collect their ash
- Get a tin and make tiny holes in its bottom
- Put the ash in the tin
- Pour water on the top layer of ash in the tin
- Let water drip through tiny holes into a jar.
- The dripping water in the jar is called filtrate
- The filtrate will be salty
- Boil the filtrate to dryness

Importance of salt

- Salt is used to preserve food
- Salt is used to flavor food
- Salt is sold to get money
- Salt is used to turn soft water into hard water
- Salt is used in animal feeds
- Salt is used to make simple acids.