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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 liquid substance made up of hydrogen and oxygen.

Water is a universal solvent because;

- It dissolves almost all solutes

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

Why is water said to be life?

- It supports plant and animal life

Name any four natural sources of water.

- Rain
- Lakes
- Rivers
- springs
- Swamps
- Oceans
- Seas

Give two artificial sources of water.

- Dams/Valley dams
- Boreholes
- Wells
- Tanks
- Ponds

Name the main/primary natural source of water in the environment

- Rain

What is Pure water?

- This is water without any impurities in it.

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 100^0C/ 212^0F
- Pure water freezes at 0^0C/32^0F
- 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 water that does not form lather easily with soap.

Reason why hard water does not form lather with soap easily

- It contains dissolved mineral salts
- It contains high mineral content

Name two mineral salts that make water hard

- Calcium
- Magnesium

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 distillation
- By boiling it/ heating it
- By adding chemicals in hard water.

Give one advantage of hard water

- It contains mineral salts which are good for our health.

State two disadvantages of using hard water.

- Hard water wastes soap.
- Hard water makes washing difficult.
- Hard water stains clothes.
- It forms stains in containers

What is soft water?

- This is water that forms lather easily with soap.

Reason why soft water forms lather easily with soap.

- It has low mineral content.
- It doesn't contain mineral salts

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 does not waste soap.
- Soft water does not stain clothes
- It does not form fur in containers.

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 which contains impurities in it.

Give two characteristics of impure water

- Impure water contains impurities.
- Impure water smells/ It has bad odor
- Impure water has taste
- Impure water has color
- It doesn't foam lather easily with soap

What is water pollution

- This is the introduction of harmful substances into water sources.

What is water contamination?

This is the release of harmful substances into water.

Give any two ways of polluting/contaminating water

- By discharging sewage into water.
- Washing clothes and containers from water sources
- By urinating in water sources
- By defecating in water sources
- By bathing/swimming in water sources
- Allowing animals to drink from water sources
- By silting
- By releasing industrial wastes into water
- By dumping rubbish/garbage into water sources

What are water pollutants/impurities/contaminants.

- These are substances that change the quality of water and make it unsafe.

Name four examples of water pollutants/impurities/contaminants

• Urine • Faeces • Bacteria • Herbicides • Silt • Industrial wastes	• Fertilizers • Pesticides • Dung • Dust • Sewage • Garbage

Name two examples of organic water impurities/pollutants.

- Bacteria
- Viruses
- Protozoa
- Fungi

Sitting

- This is the deposition of silt into waterbodies.
- This is the deposition of eroded materials into waterbodies
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Silt

- Particles of soil and other materials which are carried into waterbodies by flowing water.

Causes of silting

- Soil erosion
- Cultivation along waterbodies

Disadvantages/dangers of silting

- It makes waterbodies shallow
- It contaminates/pollutes waterbodies
- It leads to death of aquatic/marine animals
- It destroys habitats of marine animals.

Give two effects of water pollution/contamination

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

Water associated diseases

- These are diseases connected to dirty/contaminated water.

Groups of water associated diseases

- Waterborne diseases
- Water cleaned diseases
- Water habitat vector diseases
- Water contact diseases

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

Disease	**Germ group**	**Germ name**
Cholera	Bacteria	Vibrio cholerae
Polio	Viruses	Poliovirus
Typhoid	Bacteria	Salmonella typhi
Dysentery	Bacteria Amoeba	Shigella Entamoeba histolytica
Diarrhea	Bacteria	Escherichia coli.

Bilharziasis	Worms	Schistosoma
Hepatitis A	Viruses	Hepatitis A virus

What are water habitat vector diseases?

- These are diseases spread by vectors that live or breed in water.

Mention examples water habitat vector diseases

Disease	**Vector**	**Germ**	**Germ name**
Yellow fever	Tiger mosquito Aedes mosquito	Virus	Yellow fever virus
Dengue fever	Tiger/Aedes mosquito	Virus	Dengue virus
Malaria	Anopheles mosquito	Protozoa	Plasmodium
River blindness	Blackfly	Worm	Onchocerca volvulus
Elephantiasis	Culex mosquito	Worm	Filaria
Bilharziasis	Fresh water snail	Worm	Schistosoma

What are water cleaned diseases?

- These are diseases we get when we lack enough clean water to clean our bodies.
- These are diseases we get when we don't use enough clean water to clean our bodies.

Mention examples of water cleaned diseases

- Conjunctivitis
- Scabies
- Impetigo
- Eczema
- Trachoma

What are water contact diseases?

- These are diseases got from bathing or swimming in contaminated water.
- These are diseases we get when our bodies get into contact with contaminated water.

Mention examples of water contact diseases?

- Bilharziasis

- Swimmer's itch

Preparation of clean water for washing, bathing and cooking.

What is clean water?

- This is water which is free from impurities.

Give two ways of purifying water/ making water clean

- By filtering it
- By decanting it
- By distilling it

Mention three methods of purifying water/making water clean

- Filtration
- Decantation
- Distillation

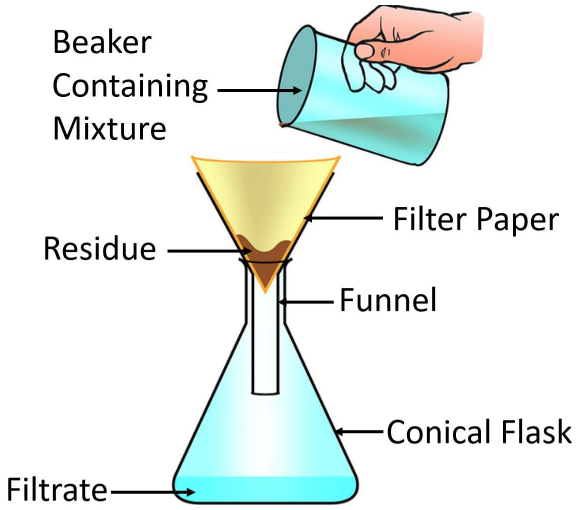
FILTRATION

- This is the separation of solid impurities from water using a filter.
- This is the separation of solid particles from water using a filter/sieve

Materials used when filtering water

- Filter paper
- Sieve
- A clean cloth
- Sand
- Water purifier
- Grass/leaves
- A funnel
- Porcelain filter

An illustration showing filtration



What are residues?

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

What is a filtrate?

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

Application/importance of filtration.

- It is used to separate seeds from fruit juice
- It is used to remove tea leaves from tea
- It is use to remove mud, soil particles and stones from water.
- It is used to remove solid particles from local brew

W**hy is filtered water not good for drinking?**

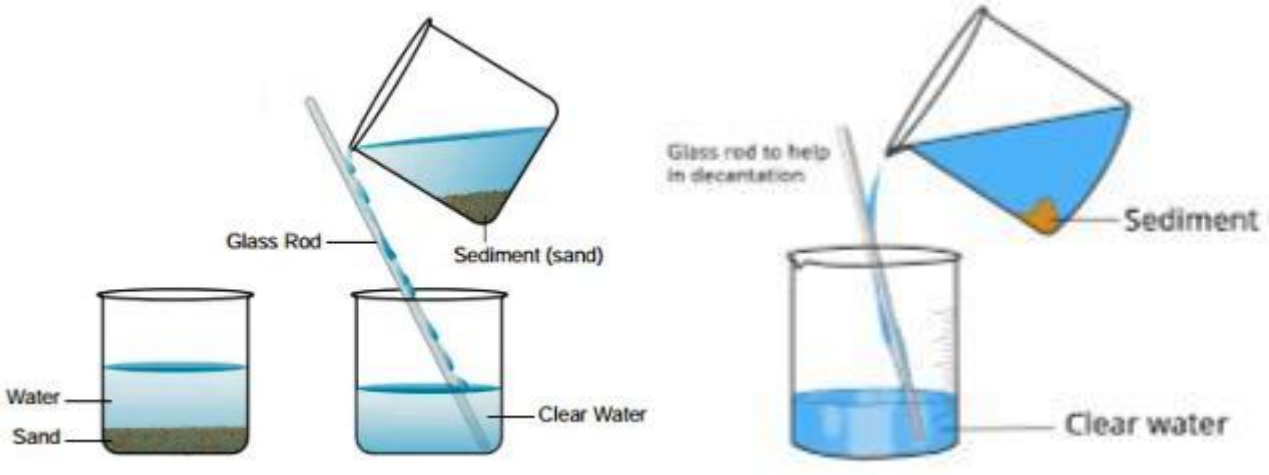
- It may still contain germs.
- The filter can't kill germs.

Decantation

What is decantation?

- This is the process of pouring off clear water at the top from a container into another container leaving sediment at the bottom.
- The clean water 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 clean water at the top is then poured off into another container without disturbing the sediment



Application of decantation

- It is used to separate clear water from muddy water.
- It is used to separate juice from seeds.
- It is used to separate tea from tea leaves.

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?

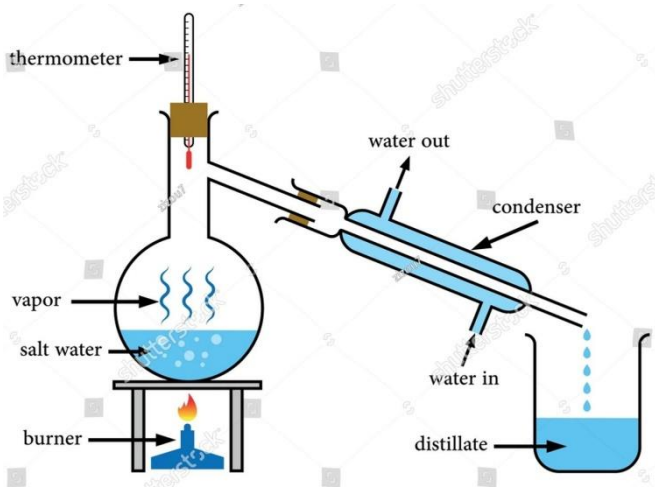
- This is the method used to get a pure liquid by heating impure liquid and condensing its vapour.
- This is a method of purifying liquids by heating an impure liquid and cooling its vapour
- The impure liquid is heated and its vapour is condensed to get a pure liquid.
- The pure liquid obtained is called 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.
- It is used to clean injection sites on the body.
- It is used to clean wounds and cuts.
- It is used in drips
- It is used to clean medical instruments

Give two ways of making water safe to drink

- By boiling it
- By treating it with chemicals

Mention two methods of preparing safe water for drinking

- Boiling
- Water treatment

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?

- $100^0C/212^0F$

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 dirt/sediment.

Why is it advisable to drink boiled water?

- To prevent waterborne diseases.

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

- To prevent it from 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
- By vectors after falling in it.

Give two ways of preventing boiled water from getting recontaminated.

- By putting it in a clean container
- By covering it.
- Keeping it under cold conditions.

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?

- This is the use of chemicals to kill germs in water
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Reasons for water treatment

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

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

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

Give three disadvantages of treating water using chemicals.

- Chemicals are expensive to buy.
- Chemicals add some smell to water
- Chemicals add some taste to water
- Chemicals make water unclear
- Some people are allergic to chemicals

What is chlorination?

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

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 act of separating clothes and putting them into different groups.

Factors considered when sorting clothes

- Colour
- Type of fabric
- Nature of clothes
- Intensity of dirt
- Purpose of clothes/use of clothes

Reasons for sorting clothes before washing them.

- To prevent dye/colour transfer.
- To protect delicate clothes.
- To prevent clothes that bleed/shed colour from staining others.
- To prevent clothes with more dirt from staining those with less dirt.

Soaking clothes

- This is the act of putting an leaving dirty clothes in water for sometime before washing.

Importance of soaking clothes

- It helps to loosen and dissolve dirt/stains in clothes for easy removal.
- It helps to soften clothes for easy washing

Washing clothes

- This is the act of squeezing and rubbing 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 from clothes
- To remove germs, vectors and parasites from clothes
- To remove bad smell/odour from clothes
- To kill germs, vectors and parasites that hide in clothes.

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

Importance of housing (houses)

- Protect people and animals from harsh weather
- Give privacy to people
- Protect people and animals from enemies
- Commercial houses are source of income.
- Houses are used to store tools and products.
- Houses can be used to get loans from the bank.

Types of houses

- Permanent houses
- Temporary houses

Factors to consider when selecting a site for a house.

- Distance from a water source
- Distance from the main road
- Distance from the market center
- Nature of the soil.
- Nature of the landscape
- Distance from the health center
- Safety or security of the area.