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THEME: SCIENCE IN HUMAN ACTIVITIES AND OCCUPATION
TOPIC 1: SCIENCE AT HOME AND IN OUR COMMUNITY
LESSON

Water is a chemical substance made up of hydrogen and oxygen

These gases are in the ratio of 2:1

Components of water

1. Hydrogen
2. Water

Sources of water

Rain is the main source of water; however, water can be found in:

- ✓ Lakes
- ✓ Rivers
- ✓ Seas
- ✓ Oceans
- ✓ Springs
- ✓ Ponds
- ✓ Swamps
- ✓ Artesian wells

Pure water

Pure water is water which contains no impurities.

Properties or characteristics of pure water

1. It is colorless
2. It is tasteless
3. It is odorless (has no smell)
4. It is free from bacteria and other living creatures like algae
5. It is free from dissolved salts and gases

Properties of water

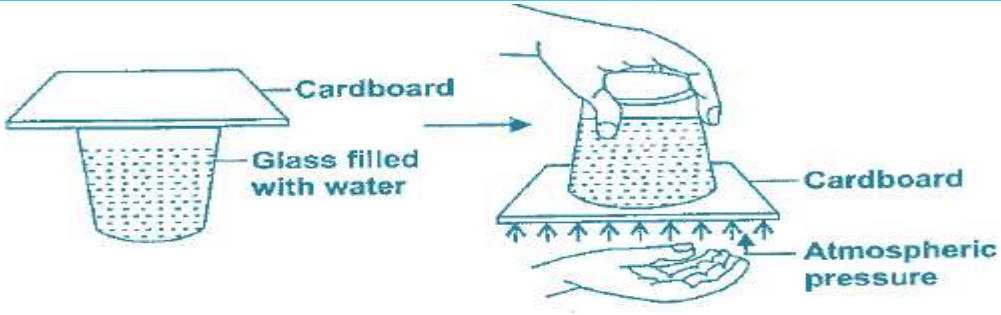
1. Water exerts pressure
2. Water finds its own level
3. Water is a good solvent
4. Water can dissolve gases

Experiments to show different properties of water

1. Water exerts pressure

A cardboard is lowered onto the glass of water till there is no space between them.

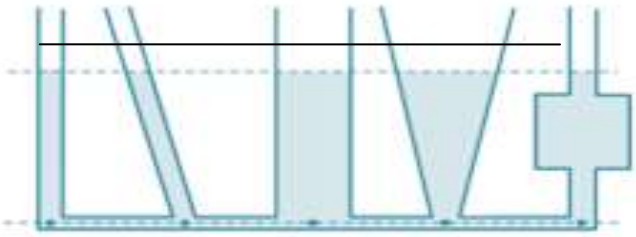
The glass full of water is turned upside down while the cardboard is gently covering it.



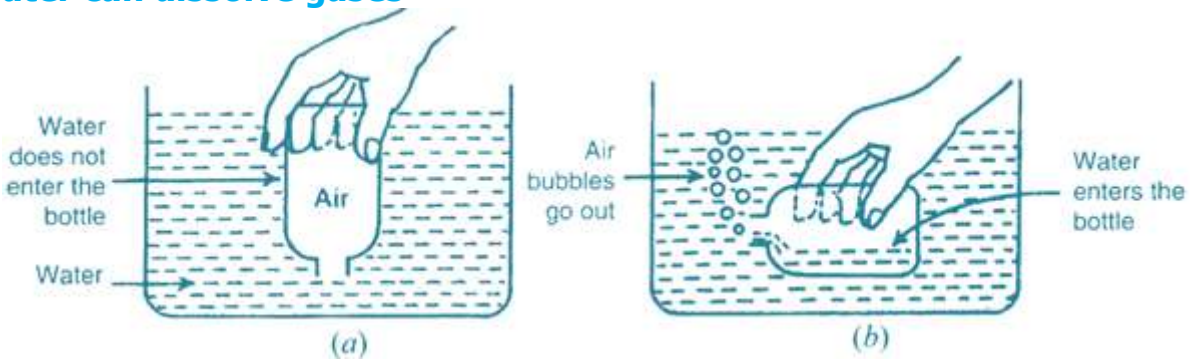
Observation

The cardboard will be strict to the glass of water. This is due to the atmospheric pressure exerted on to it.

2. Water finds its own level



3. Water can dissolve gases



Uses of water in the body

1. Water makes up part of blood as plasma
2. Water helps to dissolve digested food for easy digestion
3. Water maintains the shape of the body cells
4. Water takes part in changes that must occur in the body such as cooling as sweat.
5. Water is a medium where chemical changes takes place in the body.

Domestic uses of water

1. Water is used for cooking food
2. It is used for washing clothes
3. Water is used for bathing our bodies
4. Water is used for washing utensils
5. Water is provided to animals to drink

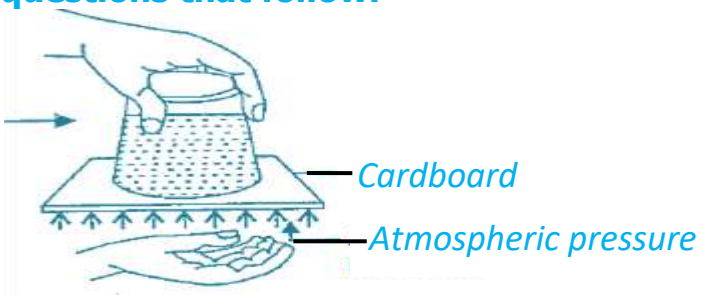
Industrial uses of water

1. Water is used for generating electricity
2. Water is used for recreation like swimming and boating
3. Water is used for cooling machines in industries
4. Water is used to clean machines in industries

Activity

1. Name the chemical substance made up of hydrogen and oxygen.
   .....
2. Mention **two** components of water.
   .....
   .....
3. Name the main natural source of water in the environment.
   .....
   .....
4. Why is rain referred to as the main source of water?
   .....
   .....

The diagram below demonstrates a property of water. Use it to answer the questions that follow.



5. State the property of water demonstrated above.
   .....
   .....
6. Give **one** effect of the atmospheric pressure on the card board.
   .....
   .....
7. State **two** characteristics of pure water.
   (i).....
   (ii).....
8. State **two** artificial sources of water.
   .....
   .....
9. How is pure water different from the clean water?
   .....
   .....
10. Write the property of water is also found in air?
    .....
    .....
11. Mention any **two** properties of water.
    (i).....
    (ii).....
12. Give any **two** uses of water in the body.
    (i).....
    (ii).....
13. Mention any **two** industrial uses of water.

(i).....

(ii).....

14. Name the type of electricity generated from fast flowing water.

.....

.....

LESSON

Preparation of clean water

Methods of obtaining clean water from dirty water include:

1. Decantation/Decanting method
2. Filtration/Filtering method
3. Distillation (clean water is water that does not contain germs)
4. Boiling

Decantation

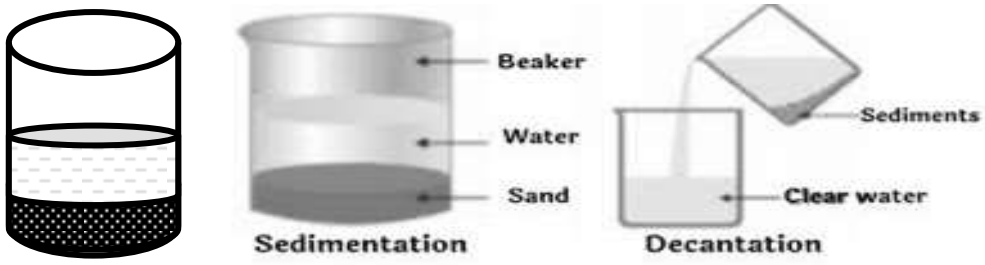
This is the process of removing solid particles from liquid.

Decanting is the process of separating liquid from a solid that has settled, by pouring carefully out of the container

Decantation method is also called a three pot system

Decanted water is not safe for drinking because it contains germs.

Experiment to show decantation



Activity

1. State any **three** steps to follow when obtaining clean water from muddy water using decantation method.

(i).....

(ii).....

2. Give another name of decantation method.

(i).....

(ii).....

3. Mention any **two** ways of obtaining clean water.

(i).....

(ii).....

4. By which process can water obtained though decanting be made safe for drinking?

(i).....

(ii).....

Boiling

When water is heated, it boils, to a temperature of 100^{o}C (212^{o}F),this temperature kills germs.

Boiling water is the best method of making it safe for human consumption.

Reasons for boiling water

1. Boiling water kills germs,
2. Boiling water prevents contamination

Why is water obtained through decantation not safe for drinking?

Filtration

This is the process of separating solid particles from a liquid.

The solid particles that remain on the filter are called the **residues**

The clean water obtained after filtration is called the **filtrate**.

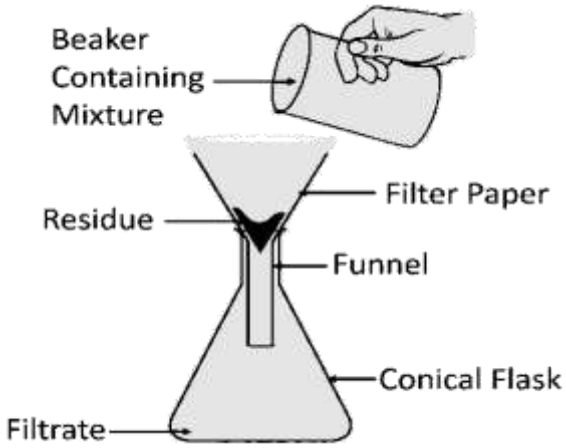
Examples of solid impurities filtered are dirt, soil, stones, leaves, animals' wastes

NB: Filtered water is not safe for drinking because it may be containing some germs.

Ways how filtered water can be made safe for drinking

- By boiling
- By treating using chemicals

Experiment to show filtration



Distillation

This is the process which involves evaporation of the liquids and then condensing the vapour to liquid form.

The water obtained through distillation is called **distilled water**.

Distillation also helps in the preparation of alcohol.

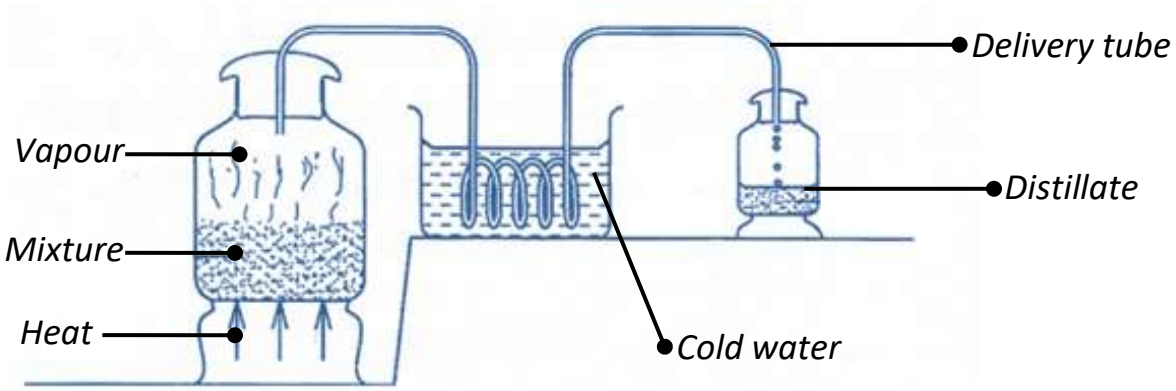
Note: Distilled water is used by doctors to mix drugs, for injection and in drips.

Distilled water is not good for drinking because it does not contain mineral salts.

Reasons why distillation is not commonly used

1. It produces small quantities of water
2. distilled water is not good for drinking since it lack mineral salts
3. Distillation process is expensive
4. Distillation is time consuming
5. Distillation needs a lot of labour

Experiment to show distillation method



Preparation of safe water

Safe water is water which is free from germs

Methods of preparing safe water

- ✓ Boiling water
- ✓ Distillation
- ✓ Treating water using chemicals like chlorine, water guard, Florine, calcium chloride, potassium permanganate

Treatment of Water

Treatment of water is when chemicals are added to kill germs in it.

Examples of chemicals used to treat water are; chlorine, water guard and aqua safe.

Advantages of Chemicals Used in Water Treatment

The chemicals kill germs in water

Disadvantages of using chemicals

1. They are expensive to buy chemicals
2. They do not make water clear
3. They add some smell and taste to water.

Activity

1. Mention any **two** methods of obtaining clean water from dirty water.
   (i) .....
   (ii) .....
2. Name the method of obtaining clean water where solid particles are removed from it.
   .....
3. State any **one** reason why filtered water is not good for drinking.
   .....
4. What term is used to mean the solid particles that remain after water filtration?
   .....
5. Of what importance is distilled water to the doctors?
   .....
   .....
6. Name the method of obtaining distilled water.
   .....
7. State the main reason why distilled water is not good for drinking.
   .....
   .....
8. Mention **two** chemicals used for treating water.
   (i) .....

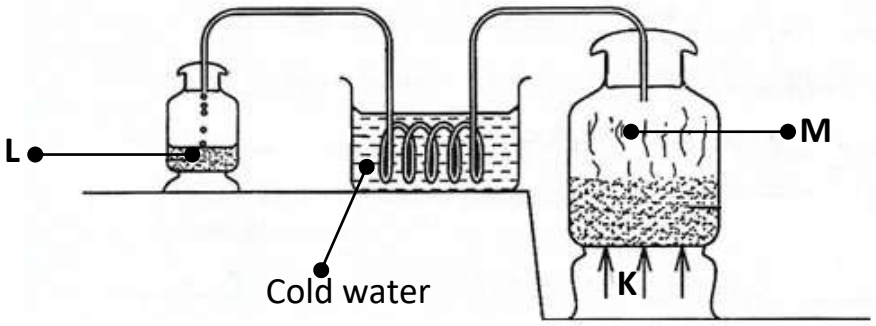
(ii) .....

9. State any **two** disadvantages of using chemicals in treating drinking water.

(i).....

(ii).....

The diagram below shows one of the methods of preparing alcohol. Study and use it to answer questions 10.



a) Name the methods used in the diagram.

.....

.....

b) Name the liquid marked with letter L.

.....

c) What do the arrows labeled **K** represent?

.....

d) State the importance of the delivery tube in the process above.

.....

e) Why is the delivery tube passes through cold water?

.....

.....

f) What process forms **M?**

.....

g) Apart from preparing water for drinking, mention any **one** other liquid prepared using distillation.

.....

.....

LESSON

Diseases associated with water

There are four ways how unprotected water can spread diseases or germs and cause diseases in people.

These are:-

- Water borne diseases.
- Water habitat vector diseases.
- Water cleaned diseases.
- Water contact diseases.

Water borne diseases

These are diseases spread through drinking contaminated unprotected water. They include the following:

1) Polio caused by virus and it attacks the skeleton or bones.
2) Bilharzia, caused by blood flukes or worms called Schistosoma spread by a water snail it attacks the urinary bladder.

3) Typhoid, caused by bacteria called salmonella typhi, it attacks the digestive system.
4) Dysentery; caused by two organisms that attack the digestive system.
(a) Bacilli called shigella.
(b) a protozoa called entamoeba hyistolytica .

Cholera caused by bacteria called vibrio cholerae. It attacks the digestive system.

5) Diarrhoea caused by bacterium, virus, worms or and any disorder of the digestive system. It also attacks the digestive system.
6) Intestinal worms; many different types of worms attack the small and large intestines.
7) Hepatitis; caused by a virus it attacks the liver.

Water habit vector diseases

These are diseases that are spread by vectors which at one stage develop or live or obtain their food from water. They include the following:

- ✓ Malaria; caused by a protozoa called plasmodia which is spread by a female anopheles mosquito.
- ✓ Yellow fever and dengue fever; they are both caused by virus which is spread by tiger or aedes mosquito.
- ✓ Bilharzia.
- ✓ River blindness; caused by a worm called onchocerca vulvulus which is spread by the black fly. It attacks the skin and eyes.
- ✓ Elephantiasis caused by a worm called filaria which is spread by the culex mosquito. It attacks and blocks the blood vessels and nerves in the legs making them to swell and grow big like those an elephant.

Water cleaned diseases:

These are diseases which we get if we do not use enough water to keep clean. They include:

i. Conjunctivitis. ii. Diarrhoea.

It is caused by either bacteria or virus.

iii. Impetigo.

They can also be spread by houseflies

It is caused by bacteria.

It attacks the contaminated hands, handkerchiefs, skin and causes spots with pus in water or towels.

It attacks the eyes, the face, nose, ears and head.

iv. Scabies:

It is caused by an itch mite. It attacks the skin and causes a lot of itching.

Water contact diseases

These are diseases we get from bathing and swimming in unprotected contaminated water. They include:-

1. Sore eyes and ears; pus comes out of the ears and they pain.
2. The nose pains and becomes stiff.
3. Swimmer's itch, it causes itching all over our bodies

4. Bilharzias.

Activity

1. What are water borne diseases?
   .....
   .....
2. State any **two** examples of water borne diseases.
   (i).....
   (ii).....
3. What are water habit vector diseases?
   .....
   .....
4. Mention any **two** water habit vector diseases
   (i).....
   (ii).....
5. Name the germ which causes malaria?
   .....
   .....
6. What is water cleaned diseases?
   .....
   .....
7. State any **two** examples of water cleaned diseases.
   (i).....
   (ii).....
8. Define water contact diseases.
   .....
   .....
9. State any **two** examples of water contact diseases.
   (i).....
   (ii).....

LESSON

Water impurities

Water impurities are substances added to water and change the nature of quality of water

Impurities may be soluble or insoluble organic.

Inorganic impurities

It consists of dissolved mineral salts which make water unsafe to use.

Organic impurities

These include bacteria, fungi and protozoa others may be dead plant materials such as leaves and grass.

Examples of water impurities

1. Human wastes
2. Animal wastes like urine, dung
3. Herbicides
4. Insecticides
5. Silt from erosion
6. Microscopic plants and animals like amoeba and spirogyra

7. Dead plant matter
8. Fine particles of mud
9. Sand

Water pollution

Water pollution is the process of making water contaminated.

Ways of polluting water

1. Urinating in water sources
2. Defecating in water sources
3. Dumping industrial wastes in water sources
4. Dumping heavy metals in water sources
5. Leakages of petroleum products into water sources
6. Silting

Activity

1. What do you understand by the term water impurities?
   .....
   .....
2. Mention any **two** examples of organic water impurities
   (i).....
   (ii).....
3. State any **two** ways animal wastes which pollute water.
   (i).....
   (ii).....
4. Write down any **two** examples of chemical water impurities.
   (i).....
   (ii).....
5. Define water pollution.
   .....
   .....
6. Mention any **one** way in which water is polluted
   a) Naturally: .....
   b) Artificially: .....
7. Mention any **two** impacts of water pollution.
   (i).....
   (ii).....
8. Name any **two** water animals affected by chemical impurities.
   .....
   .....
9. Mention any **two** ways of controlling water pollution.
   (i).....
   (ii).....

Silting

This is the deposition of soil and other materials into the water bodies by erosion.

- Silting is caused when people who stay near rivers and lake shores cultivate the banks and shores removing the grass cover.

Examples of silts

1. Soil

2. Grass
3. Metal scraps
4. Plastics
5. Polythene paper

Effects of silting to water bodies

1) Silts reduces the depth of water bodies
2) Water becomes dirty or contaminated.
3) Silts leads to dryness of rivers, swamps and lakes
4) Silting leads to flooding of surrounding areas
5) Silts kill aquatic animals
6) Silts cover the breeding ground for fish

Ways of controlling silting:

1. Controlling soil erosion.
2. People should not be allowed to cultivate along river banks.

Dangers of water

- ✓ Water carries harmful germs that cause diseases like cholera and typhoid
- ✓ Poisonous substances from factories, human wastes, detergents are often dumped into rivers and lakes by water.
- ✓ Flowing water causes soil erosion
- ✓ Heavy floods destroy man's crops and cause a lot of damage to property.

Activity

1. How is silting different from silt?
   .....
   .....
2. Mention any **one** impact of flowing water to lakes and river
   .....
   .....
3. Mention any **two** examples of silts
   (i).....
   (ii).....
4. Give any **two** effects of silting to water bodies.
   (i).....
   (ii).....
5. Write **two** ways of controlling silting of water.
   (i).....
   (ii).....
6. Mention any **two** examples of aquatic animals affected by the silts.
   (i).....
   (ii).....
7. Mention any **two** weather hazards related to water.
   (i).....
   (ii).....
8. Name any **two** diseases spread through water.
   (i).....
   (ii).....

LESSON

Hard and soft water

- ✓ **Hard water** is water that contains certain mineral salts dissolved in it. Hard water does not form scum with soap easily.

Hard water is not good for washing clothes because:

- ✓ It leads to wastage of soap while washing
- ✓ It causes stains on clothes

Soft water is water that forms scum easily with soap

Ways of removing hardness from water

- ✓ Adding chemicals to hard water e.g. chlorine and water guard
- ✓ Boiling water
- ✓ Through distillation

Cleaning clothes in a home

One main use of water at home is to wash clothes. Clothes that need to be washed are called **laundry**

Step taken in cleaning clothes at home

1. **Sorting** is the practice of identifying dirty clothes which have been used.

Main reason for sorting clothes before washing them

1. To identify dirty clothes from the clean ones
2. To prevent colour bleeding

(ii).....

3. State any **two** activities done before washing clothes in a home.
(i).....
(ii).....

4. What is sorting as used in **cleaning clothes?**
.....
.....

5. Suggest **two** main reasons for sorting clothes before washing them.
(i).....
(ii).....

6. State any **two** factors to be considered when sorting clothes for washing them.
(i).....
(ii).....

7. State any **two** challenges of not sorting clothes before washing them.
(i).....
(ii).....

8. How is soaking clothes different from sorting clothes?
.....
.....

9. State any **two** disadvantages of soaking clothes for so long.
(i).....
(ii).....

10. Why do we soak clothes before washing them?
.....
.....

3. **Washing**

Washing is the act of squeezing of the cloth together with the detergents.
It is the removal of dirt using water and detergent.

Types of washing clothes

- Hand washing
- Machine washing

Hand washing involves using human hands to remove dirt and stains from clothes.

Advantages of using hand washing

1. It is cheap
2. It promotes physical exercises
3. It is environmentally friendly
4. It saves the fabrics against machine damage
5. Dirt and stains are eliminated completely
6. It uses less water and detergents
7. It helps to maximize proper hand hygiene

Disadvantages of using hand washing

1. It takes a lot of time
2. It needs a lot of effort and energy
3. It fades the fabrics quickly
4. Some detergents used in washing cause skin infection

Machine washing

This is the use of laundry machines to remove dirt and stains from clothes.

Advantages of using machine washing

1. It does not take a lot of time
2. It needs little effort and energy to clean clothes
3. It does not fade the fabrics quickly
4. It protects the skins against skin infection caused by some detergents used in washing

Disadvantages of using machine washing

1. It is expensive
2. It does not promote physical exercises
3. It is environmentally unfriendly in term of pollution
4. It damages the fabrics quickly
5. Dirt and stains are not eliminated completely
6. It uses more water and detergents
7. It does not maximize proper hand hygiene

Activity

1. What term is used to mean the removal of dirt using water and detergent.
   .....
   .....
2. Mention any **two** types of washing clothes
   (i).....
   (ii).....
3. State any **two** advantages of cleaning clothes using hand washing
   (i).....
   (ii).....
4. Mention any **two** disadvantages of using hand washing
   (i).....
   (ii).....
5. What is meant by machine washing?
   .....
   .....
6. State any **two** advantages of using machine washing.
   (i).....
   (ii).....
7. Give any **two** disadvantages of using machine to wash clothes.
   (i).....
   (ii).....

Importance of washing clothes

1. To eliminates germs and bacteria from clothes
2. It reduces incidence of infectious diseases such as respiratory, skin and diarroheal diseases
3. To remove dirt
4. To remove toxic chemicals from clothes
5. It helps to remove disease spreading vectors like lice, fleas and ticks
6. To reduce dye bleeding

7. It helps to promote personal hygiene
8. To avoid odor retention in clothes

Clothes are supposed to be washed inside out

Reasons for washing clothes inside out

1. To reduce pilling of dirt
2. To prevent colour bleeding
3. To protect decorative designs
4. To avoid odor retention
5. To expose hiding vectors found on the clothes

Items used for wash clothes

1. Clean water
2. Detergents
3. Soap
4. Basin

4. **Rinsing i**s the act of dipping soapy clothes in clean water to remove soap solution
5. **Wringing**
   It involves squeezing water out of the clothes

NOTE: Woolen clothes should be dried without wringing because it may loosen the fabric and makes them to lose their shape.

6. **Drying** is done by putting the clothes in the sun to dry. The heat energy from the sun causes evaporation of water from the clothes

Ironing:

Ironing is when you use a flat iron to press on the clothes to remove the wrings, twists and squeezes in the cloth.

Reasons for ironing clothes

1. To kill parasites like lice, itch mites etc
2. To kill germs
3. Ironing makes the cloth straight and smart

Activities after washing clothes

1. Drying clothes
2. Ironing clothes
3. Packing clothes

Activity

1. What are vectors?

   .....
   .....

2. Mention any **two** disease spreading vectors which live on clothes.
   (i).....
   (ii).....
3. State any **two** importance of washing clothes regularly.
   (i).....
   (ii).....
4. Apart from washing clothes, mention any **two** other uses of soap.

(i).....
(ii).....

5. State any **two** reasons why clothes are supposed to be washed inside out

(i).....
(ii).....

6. Mention any **two** items used to wash clothes.

(i).....
(ii).....

7. How is rinsing different from wringing?

.....
.....

8. State the main reason why woolen clothes should be dried without wringing.

.....
.....

9. Name the form of energy which helps to dry clothes.

.....
.....

10. Which element of weather helps to dry clothes at night?

.....
.....

11. Mention **two** reasons for ironing clothes to a P.7 candidate.

(i).....
(ii).....

12. Which element of weather helps to dry clothes at night?

.....
.....

13. State any **two** activities done:

a) after washing clothes

(i).....
(ii).....

b) before washing clothes

(i).....
(ii).....

THE FIRST TOPIC OF TERM III P6 SCIENCE IS OVER

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