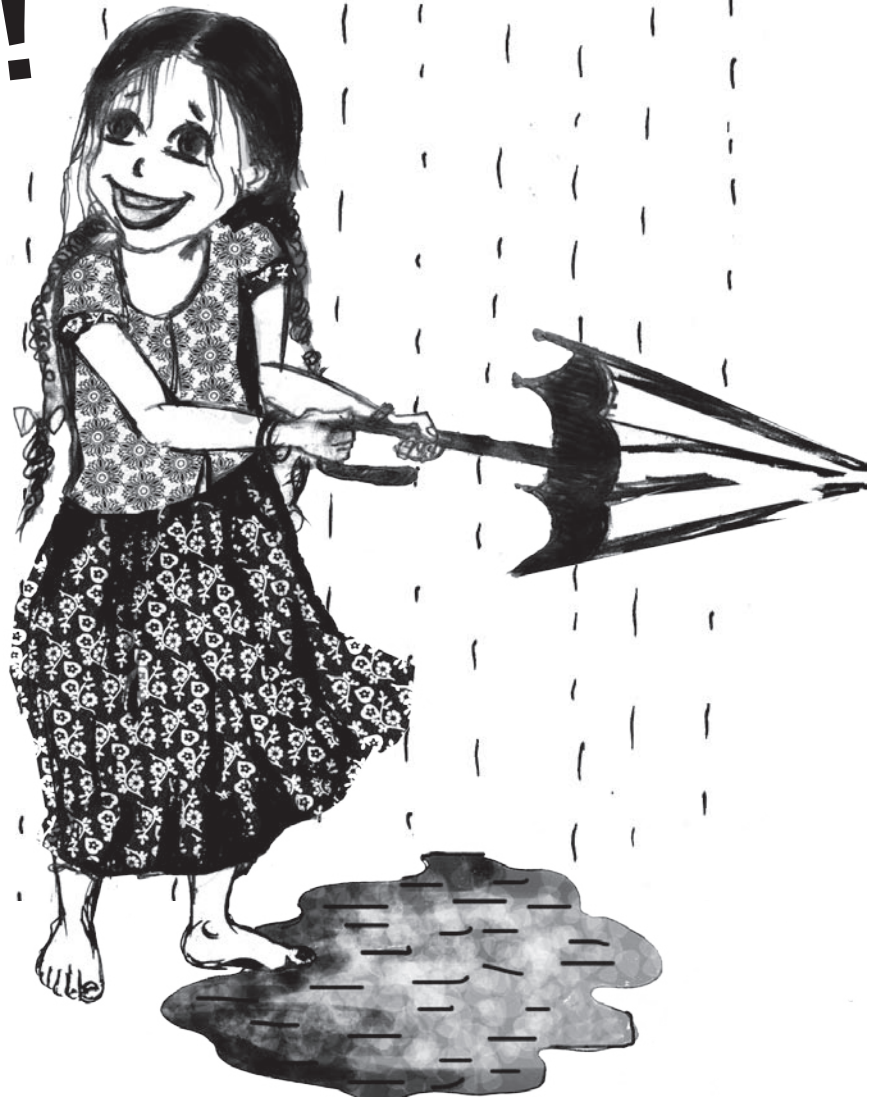




WATER !

WATER !



Credits

Project Coordination

Peeyush Sekhsaria

Concept and Framework

Peeyush Sekhsaria

Shashwati B.

Research

Shashwati B.

Content

Shashwati B.

Peeyush Sekhsaria

Meena T.

Venkatesan G.

Thiagu V.P.

Design

Shashwati B.

Illustration

Sathyan C.

Thara Thomas

Shashwati B.

Ayush Rajvanshi

Photographs

Shashwati B.

Venkatesan G.

Translation

Meena T.

M.L. Satyan

Field Testing

Thiagu V.P.

Support Services

Anand M.

Gurunathan

Printing

Manjushree Printers

Illustration Credits

Sathyan C.

Pages 2, 3, 4, 5, 6, 7, 8, 9,
12, 13, 14, 15, 16, 17, 22, 26

Thara Thomas

Pages 1, 2, 3, 4, 5, 12, 13,
18, 23, 25, 27, Front & Back
Cover

Shashwati B.

Pages 10, 20, 21, 22

Ayush Rajvanshi

Page 17

Contents

Meet Thanneer Thangamani	1
Importance of Water	2
Water Cycle	4
How much water do we have?	5
Uses of Water	6
Water Sources	8
My Home's Water Sources	12
My Village's Water Sources	13
Water Pollution	16
Types of Water Pollution	16
Ways of Treating Water	20
SODIS	24
Water Conservation	26
Things you can do to make a difference	27
Acknowledgements	28

How to use this book :

The activities in this book have been designed to allow the children to make connections between important concepts related to water and their actual lived experiences.

For the book to be really effective it is important for the children to carry out as many of the recommended activities as possible.

The exercises work best if carried out in a small group of 10 - 20 children, with observations, findings and questions being discussed at the end of each session.

To make copies of the book you can either photocopy the entire book, or just the individual activities.

Have fun with the book !!

All the best !

This is Thanneer
Thangamani*...



VANAKKAM!! **

Sweet, bubbly and very smart, she is going to be our faithful guide on our journey to understand water..

* 'Thanneer' is the Tamil word for water & 'Thangamani' is a common female Tamil name. Put together it means 'Water Thangamani!'

** 'Vanakkam' in Tamil means 'Welcome' or 'Hello!'

Importance of Water

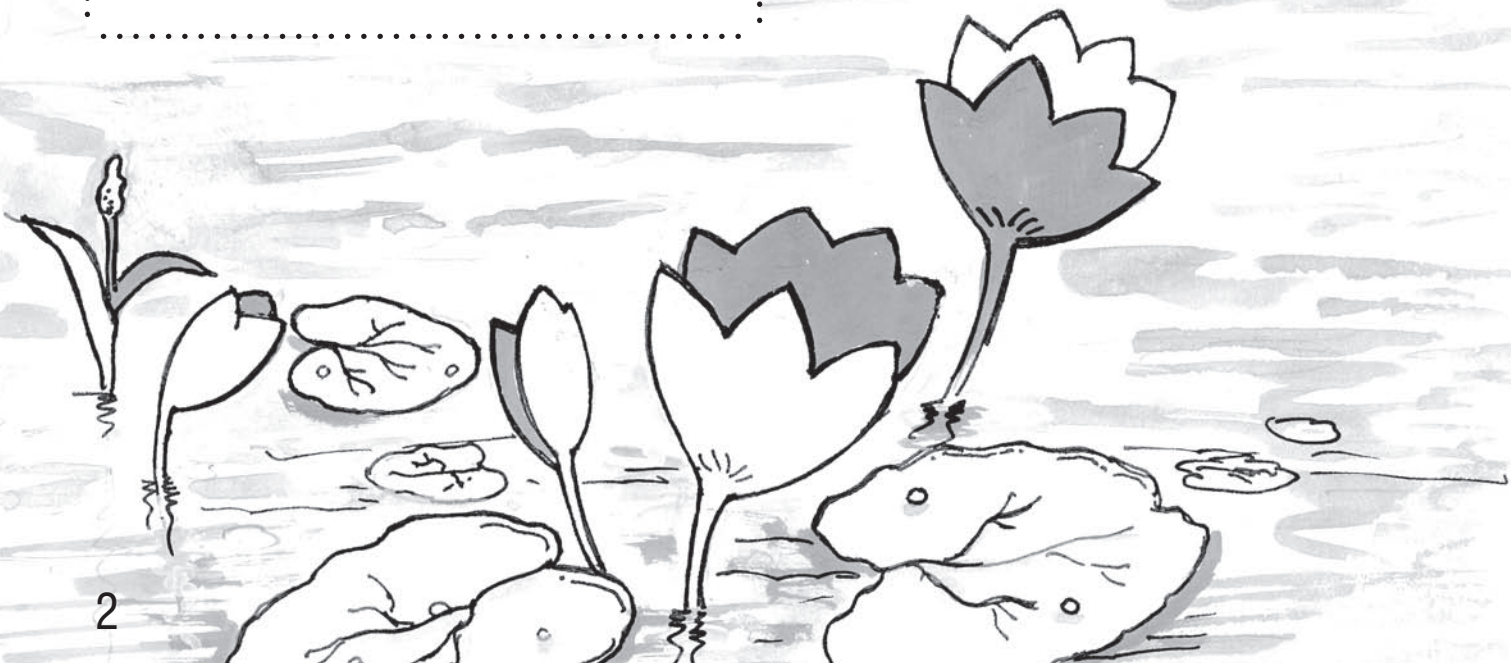


Water is essential for all living things, plants and animals. All organisms need water to maintain life processes. Some organisms live in water, some others breed only in water. Though the amounts of water required are different for different organisms, none can do entirely without it.

Activity

Look at the picture below. It shows a beautiful summer day by the village pond! But why does it look so empty? Thangamani is missing her pond friends. Help her by drawing them in and around the pond.

Discuss ways in which the lives of these creatures are intertwined with the pond.



Discussion:

Think about a time when you felt very thirsty. Now describe how it made you feel to the group...

Did You Know ?

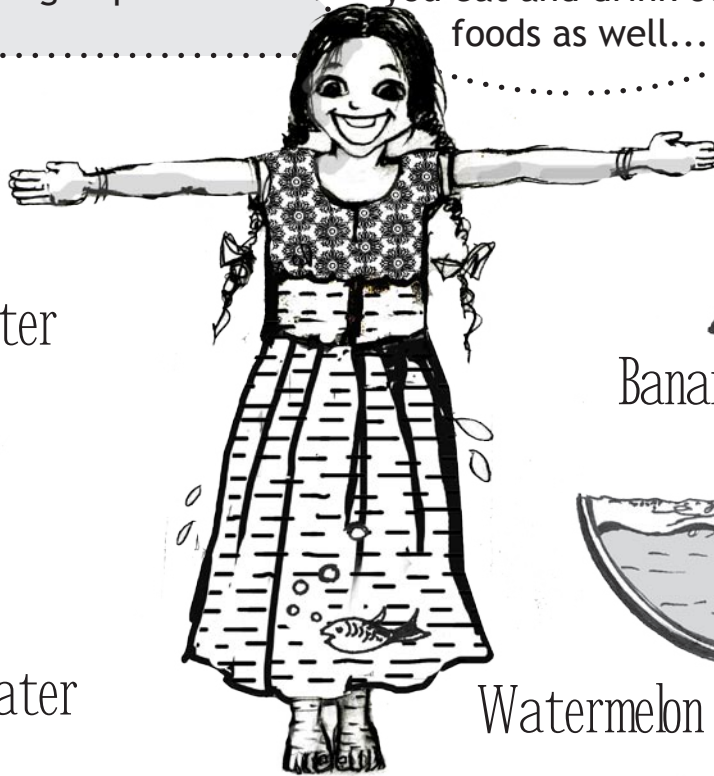
Your body is actually about **65 % water!**
You take in water when you eat and drink other foods as well...



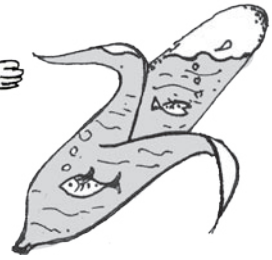
Egg - 74 % Water



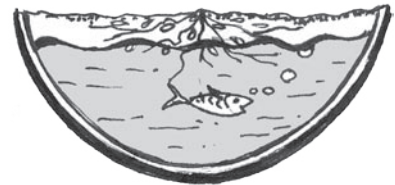
Milk - 87 % Water



Human Body - 65 % Water



Banana 76 % Water



Watermelon - 93 % Water

Blood is mostly water, and your muscles, lungs, and brain all contain a lot of water. Your body needs water to regulate body temperature and for nutrients to travel to all your organs. Water also transports oxygen to your

cells, removes waste, and protects your joints and organs.

It is therefore very important to drink enough water everyday. For children the required intake of water is about 1-1.5 litres of water daily.

Activity

Do you drink enough water ? Fill in the following to find out:

No. of glasses of water I drink each day

This equals litres of water consumed daily.

Remember: 1 glass = 0.25 lt

Water Cycle

Have you ever wondered where all the water comes from?

Water from oceans, rivers, lakes, soil and plants evaporates when it gets heated by the sun. The water vapour rises into the atmosphere. As it rises it cools, and a process of condensation begins. The vapour turns into drops, and millions of tiny drops form clouds. When the droplets of condensed water in the clouds become heavy, they fall back to the earth as rain, or snow. As the rain falls, three things happen.

- Some of the water

evaporates immediately.

- Some of it seeps into the soil and moves underground where it is stored.
- The remaining part flows along the surface of the ground to fill rivers, and streams, and lakes and oceans. The water in rivers and streams also flows into the oceans.

And some more water gets heated, and evaporates, and condenses, and falls back to Earth in a continuous cycle...

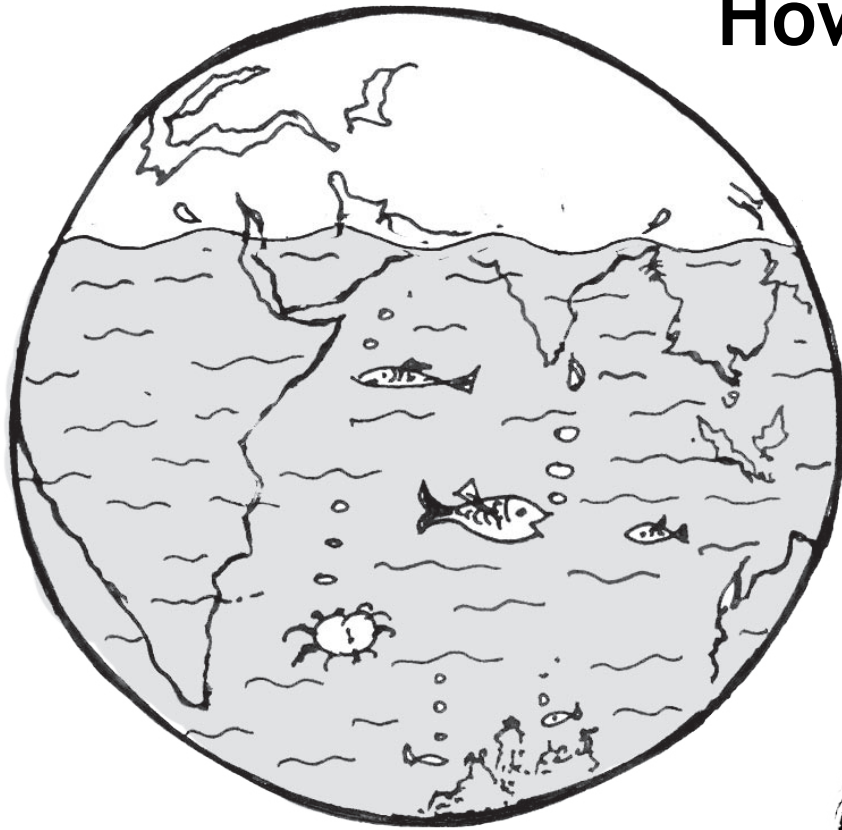
That is why it is called the water cycle.

Wooooow! The water we see today has been around since the birth of the Earth, and it will be here long after we are gone...

Activity

You are a drop of water!
On a sheet of paper, write your story, your autobiography...

How much water do we have?



When you look at our Planet Earth from outer space it looks Blue. And why? Because of Water, of course. You see, almost 75% of the surface of our planet is covered with water. No wonder the Earth is also called the Blue Planet!

Let's look at all the water we have.

97% of the Earth's water is in oceans. The ocean water cannot be directly used for daily needs because it is salty

2% of the Earth's water is frozen as ice-caps and glaciers. This cannot be easily used either.

That leaves about **1%** of water. Where is this water?
In lakes, ponds, rivers, and under the ground. This is what we call fresh water. And that is what the entire Earth has for its use!



Its simple... If we imagine that the entire volume of water the Earth has is 1 litre, then we just have a tablespoon left for us to drink.

Uses of Water

We use water in our home for various purposes - Drinking, Cooking, Bathing, Washing & Cleaning, Toilet, Cattle, Gardening etc.

Activity

For the following exercise, keep in mind your actual daily water usage at home. Use easy units like buckets / glasses / mugs to fill the blanks up.



Enact in front of the group 5 actions involved in **Cooking** that require water



Enact in front of the group 5 actions involved in **Bathing** that require water



List 5 Toilet related activities that need water:

- 1)
- 2)
- 3)
- 4)
- 5)



Enact in front of the class the act of **Drinking Water**.

What are the other liquids that you drink at home? Enact how you drink those.



Enact in front of the group 5 actions related to **Cleaning** that require water.

What are the Other Activities that need water at home? List them out here. If you have cattle, also list the Cattle related activities that need water.

- 1)
- 2)
- 3)
- 4)
- 5)

Calculate the total daily water usage of your home:

Cooking : _____

Bathing : _____

Toilet : _____

Cleaning : _____

Drinking : _____

Cattle : _____

Others : _____

.....

TOTAL : _____



1 kudam /
bucket = 15 lt



1 mug = 1 lt



1 glass = 0.25 lt

Water Sources



Activity

List the various sources of water you can spot in the picture below...

The two main sources of water are :

- 1) Surface water
- 2) Groundwater

What is surface water?

Surface water is the easiest water to understand because we see it every day. It is any water that travels or is stored on top of the ground. This would be the water that is in rivers, lakes, streams, reservoirs, even the oceans--even though we can't drink salt water.

What is ground water?

Where does the water in our wells and hand-pumps come from?

Any water that is underground is called groundwater. We see it everyday when we pump it out, but we do not understand it fully.



 Activity

What is the average depth of hand pumps / bore wells in your area ?

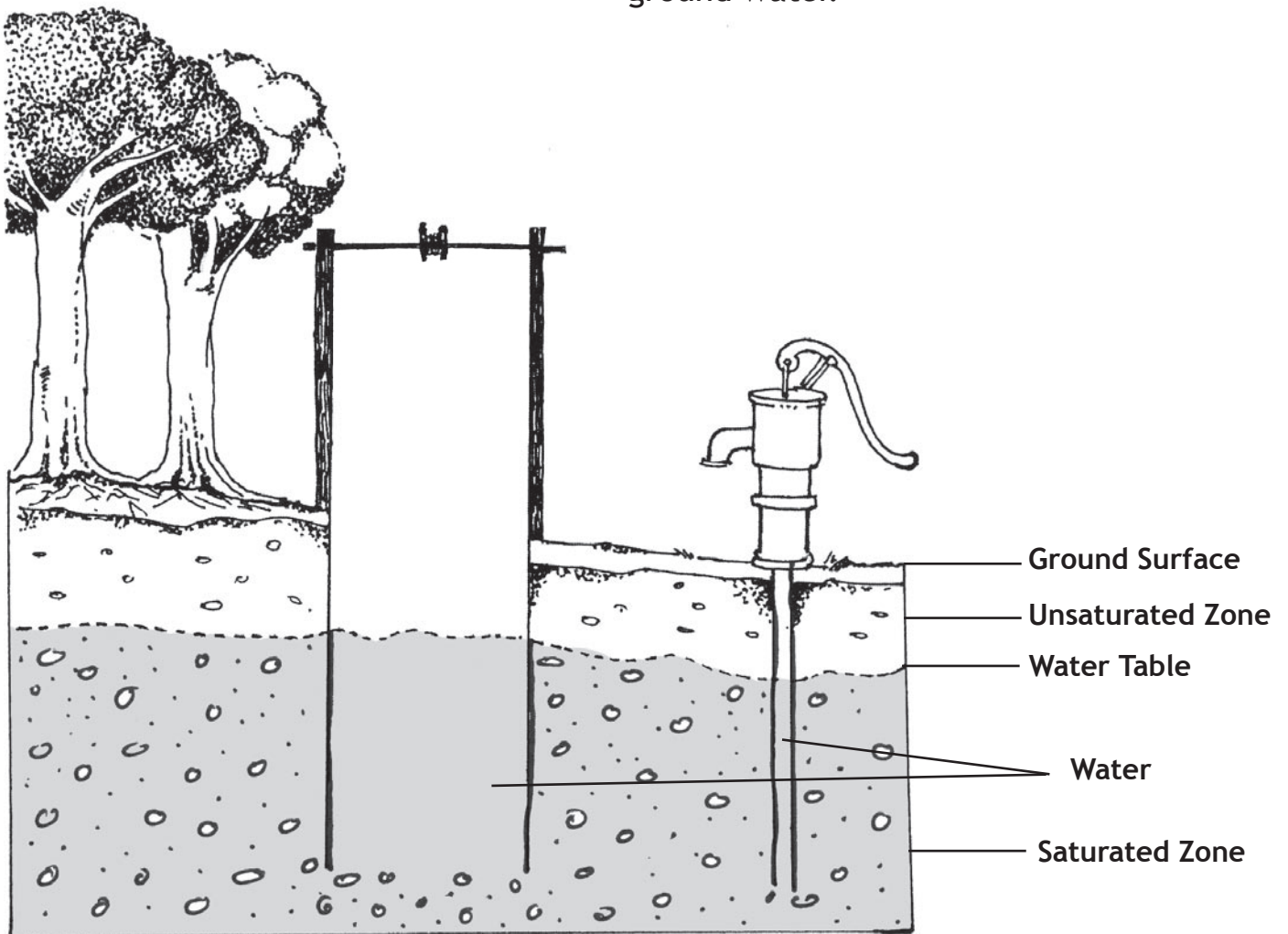
How much does a borewell / handpump this deep cost to dig?

Where does groundwater come from?

Rain soaks into the ground. The water moves down because of gravity, passing between particles of soil, sand, gravel, and rock until it reaches a depth where the ground is saturated, with water.

The amount of water that seeps into the ground depends on various factors like the slope of the land, the nature of underground strata. For example: Sandy ground will allow more water to seep in than rocky ground.

In the recent past, there has been an excessive use of bore wells and this has led to a big decrease in the ground water.

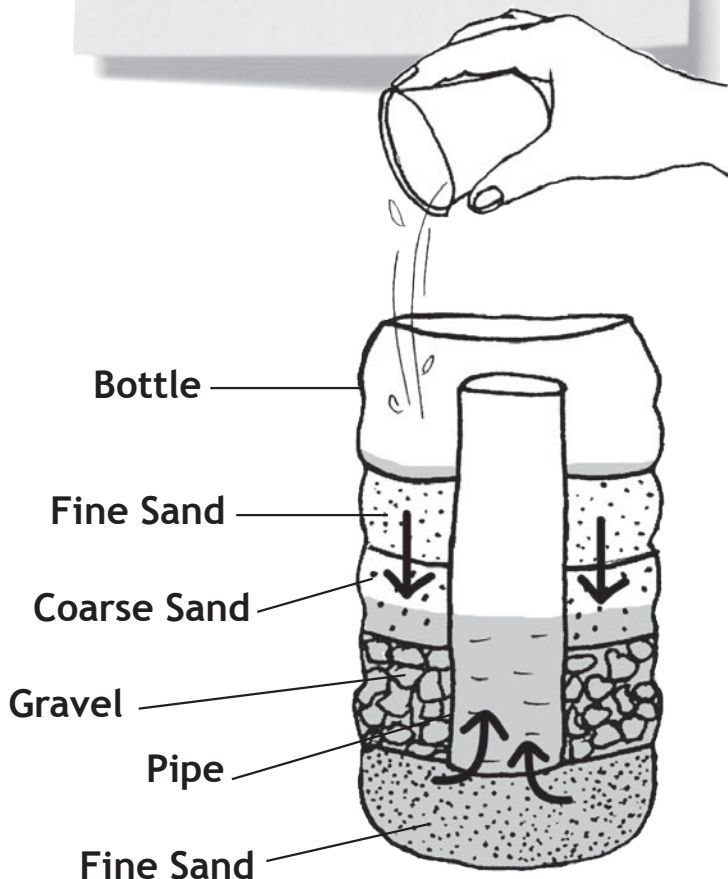




Construct your own open well!

MATERIALS REQUIRED:

- One 1 litre water bottle
- Length of pipe 1 inch diameter, that is 8-9 inches long
- Fine Sand
- Coarse sand
- Gravel
- Water
- Stick
- Pen (to mark the stick with)
- A bottle of ink with an ink dropper
- A new ink dropper



PROCEDURE

- Cut off the top of the bottle about 2 inches from the cap.
- Pour 2 inch layer of sand into the cut bottle.
- Now place the pipe inside the bottle, in the center.
- Fill the space around the pipe with a layer of gravel, then coarse sand, and finally fine sand. Leave about 3 inches free at the top.
- Slowly pour 1 glass of water into the bottle.
- Watch as the water seeps into the ground, filling the gaps in the layers.
- Your well will slowly fill up with water as the water inside and outside the well finds its own level.
- Your well is now ready. Remember the pipe /cylinder is the well and the sand in the bottle represents the land.

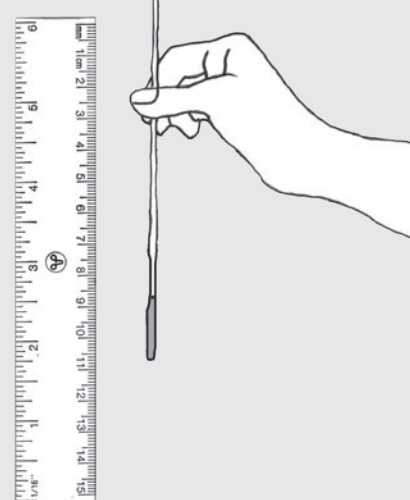
MEASURING THE WATER LEVEL OF THE WELL

1.



Dip your stick into the well till it is touching the bottom .

2.



Measure the length of the stick that is wet.

1. Measure the depth of your well using the stick.
Make a note of how much water there is.

2. Now remove some water from your well using an inkdroper. How is the water level in the well affected?

3. Now carefully add half a cup of water to the sand. This represents 'rain'.
How did the water level change?

4. Now, add five to six drops of ink as the "pollutant" to that site. After 15 minutes, use the inkdropper to remove water from the well and make a note of your observations. Is the water in the well affected?

Discuss your findings and their significance !

Now Answer the following Questions...

What does the water table level depend on?

What happened to the well water when the "pollution" was added to the "soil?"

My Home's Water Sources



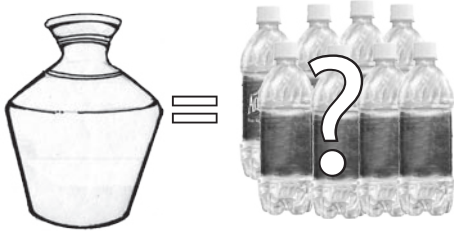
Activity

Where does your home get its water from? Are there more than one sources? List them all down below.

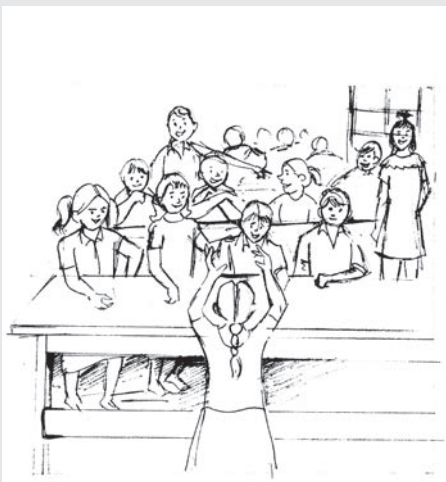
Who at home is responsible for water ?

How much time is spent each day procuring water for your home?

Activity



How much water does a kudam hold ?
Use a one litre water bottle to measure out the volume of a kudam. Next calculate the weight of a Kudam full of water. (1 litre of water weighs 1 kg)



Activity

Imagine you are bringing a kudam full of water home from the Public tap in your village. Enact the whole process in front of the group. Think about what you are trying to show. Is your pot heavy? How do you carry the pot? How do you fill the kudam with water? Who all do you meet at the tap? What all happens to you on the way home?...

My Village's Water Sources

Where does our village's water come from ?



Activity

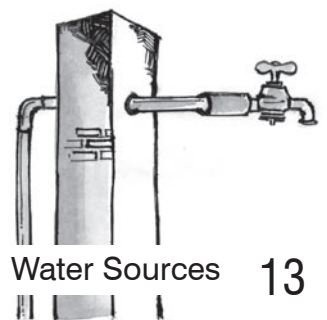
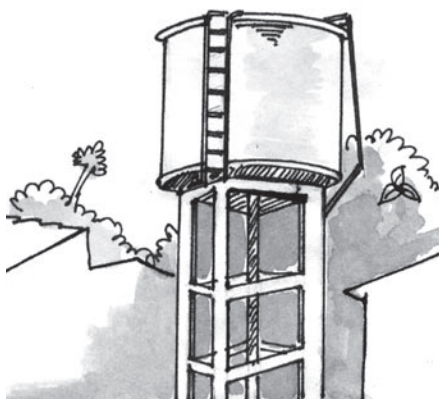
Find out all about your local sources of water. Interview some of your elders at home and answer the following questions...



1. Where all does the water in your village come from?

2. Are they surface sources of water or underground sources of water ?

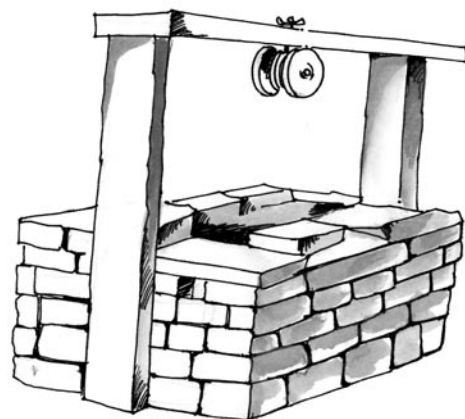
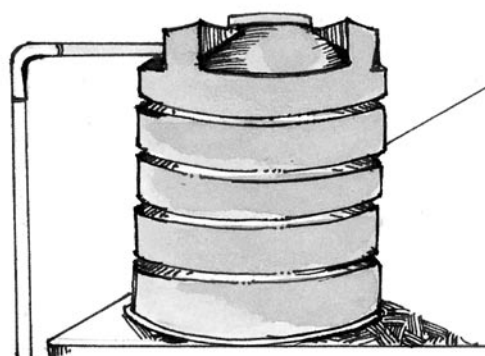
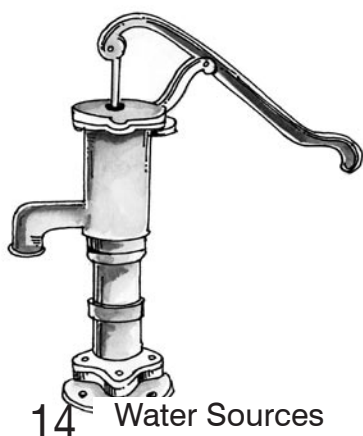
3. Where are these water sources located?



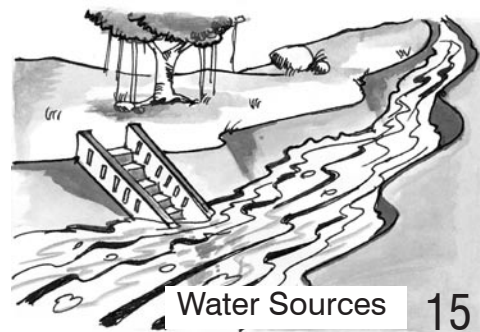
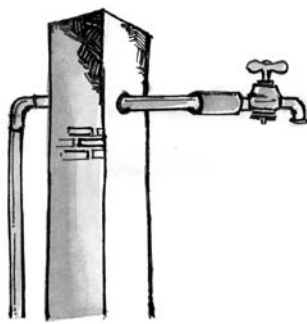
4. How is water transported from there to your home?

5. Who is in charge of the village water - Supply, Maintenance etc. ?

Talk to the older people of your village and discuss with them the water situation when they were young. Has anything changed since then? How? Why ?



Draw of the path of water all the way from the village water sources to your home. Start by drawing your home and then all the water sources in relation to it. On your map make a note of how far they are from your home and how long it takes to fetch water from there.



Water Pollution

Any addition to water that damages the water quality, making the water undrinkable and dangerous for organisms to live in is called water pollution.

Water can become contaminated in many ways.

The main types of pollutants are:

1. Organic pollutants
2. Chemical pollutants

Organic Pollutants



Open Defecation

Organic pollutants are disease-causing agents - bacteria, viruses, protozoa or parasitic worms.

Some Common Sources of organic pollutants are:

1. Faecal contamination due to Open Defecation or Direct dumping of untreated Domestic Sewage into water sources
2. Poor water storage
3. Corroded piping allowing bacterial

growth in pipes.

Organic contaminations usually make water unsafe for drinking and cooking. It usually does not affect water use in terms of bathing and washing clothes.

Water with organic contamination needs to be disinfected to be made safe for consumption. Boiling water or chlorination of the water are commonly used methods of disinfection.

E Coli

A water quality indicator



E. Coli magnified 10000 times

E. coli (Escherichia coli.), is a bacteria found in large numbers in the faeces of humans and other warm-blooded animals, but are not naturally found in water. Water that is highly polluted with faecal

matter may have E. coli counts in the tens of millions of bacteria per litre. A drinking water source is declared safe only if these bacteria are not detected in the sample.

source : commons.wikimedia.org

Chemical Pollutants

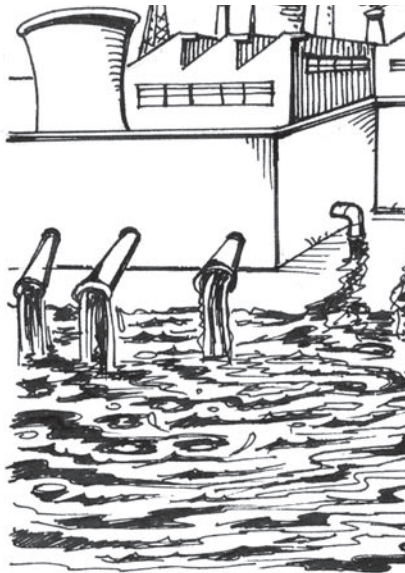
Chemical pollutants can be any of the following -

1. Water soluble acids, salts, toxic metals. Large quantities of these compounds will make water unfit to drink and will cause the death of aquatic life.

2. Water-soluble nitrates and phosphates that cause excessive growth of algae and other water plants, which deplete the water's oxygen supply. This kills fish and, when found in drinking water, can kill young children.

3. Organic compounds such as oil, plastics and pesticides, which are harmful to humans and all plants and animals in the water.

4. Water-soluble radioactive compounds can cause cancer, birth



Discharge of chemical effluents



Insecticides being applied in a field.

defects and genetic damage and are thus very dangerous. Some Common Sources of chemical pollutants are:

1. Discharge of industrial effluents
2. Leaching of pollutants from Waste dumping sites
3. Runoff of insecticides and fertilizer applied to the land leaching into groundwater or entering into a surface water

source

Chemical contamination is much more difficult to treat than organic contamination.

Most chemicals must be removed through technical processes such as adding other substances to render chemicals harmless or through filtering water. These processes can be time-consuming and expensive.



Open Dumping of Garbage

Activity

Is there a body of water near your home or your school? It could be a small pond, or stream, lake, a river or even the ocean. Take a closer look at it, and answer the following questions...

1. Is there anything unwanted floating on the surface? How dirty are the banks?

2. Do people dump garbage around the water? _____
3. Do they bathe or wash clothes there? _____
4. Do they bathe their livestock there? _____
5. Do they wash trucks or tractors there? _____
6. Are there factories around the water? Where does waste from the factories go?

7. Where does the sewage from the nearby houses go?



4. Are there any pipes leading into the water? Where do they come from?

3. List 10 unwanted materials/pollutants you find in and around the water body

8. What all is the water from this source of water used for in the village?

9. What else do you observe?

Discussion

Based on your findings discuss the following...

- Is your water source likely to be polluted?
- If so who is responsible for the pollution ?
- Are there any problems can you foresee as a result of your observations?
- Who in the village is responsible for the maintainance of this water body ?

Ideas for other activities

1. Collect and document the different types of pollutants you find in and around the water body. Create an exhibit of these collected samples that talks about water pollution, and its possible effects. Invite parents, teachers, other students and people from the village to visit the exhibit.
2. Write a letter to the panchayat or directly approach them as a group , and present to them the findings of your survey. Discuss measures that need to be taken to protect the water in the future.
3. Organize a ‘Clean- up’ campaign, around the banks of the water body.

Ways of treating water

Polluted water from most sources must be “cleaned” / treated before it can be consumed by people.

Activity

The following experiments, demonstrate the different steps involved in purifying water.

MATERIALS REQUIRED:

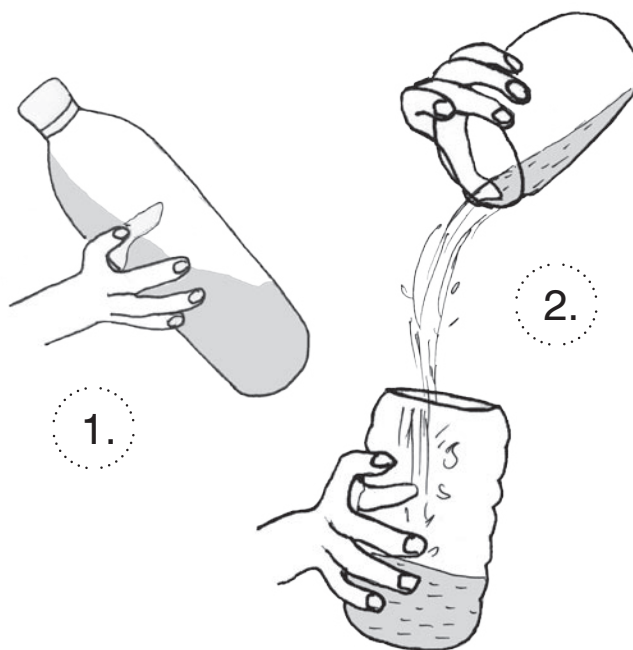
- 5 Litres of “Dirty water” (Collect a sample from a local water source, or add 2 1/2 cups of dirt or mud to 5 Litres of water)
- 1 plastic bottle with its cap
- 2 plastic bottles, with their tops cut off
- 1 large container
- 2 tablespoons of alum (potassium aluminum sulphate)
- 1 1/2 cups fine sand (beach sand) (Thoroughly cleaned)
- 1 1/2 cups coarse sand (Thoroughly cleaned)
- 1 cup gravel (Thoroughly cleaned)
- 1 cup of crushed charcoal (Thoroughly washed and dried in the sun)
- 1 piece of clean cloth
- 1 rubber band
- 1 tablespoon (for the alum)
- 1 large spoon (for stirring)

Ex. 1

Pass the “Dirty Water” around. Describe the appearance and smell of the water.

Ex. 2 - Aeration

Aeration allows gases trapped in the water to escape and adds oxygen to the water.



Procedure:

1. Place the cap on the bottle and shake the bottle vigorously for 30 seconds.
2. Continue the aeration process by pouring the water back and forth between the two cut-off bottles 10 times.

At the end of this process, the gases have escaped (bubbles should be gone). Once you are done, describe the appearance and odour of the water.

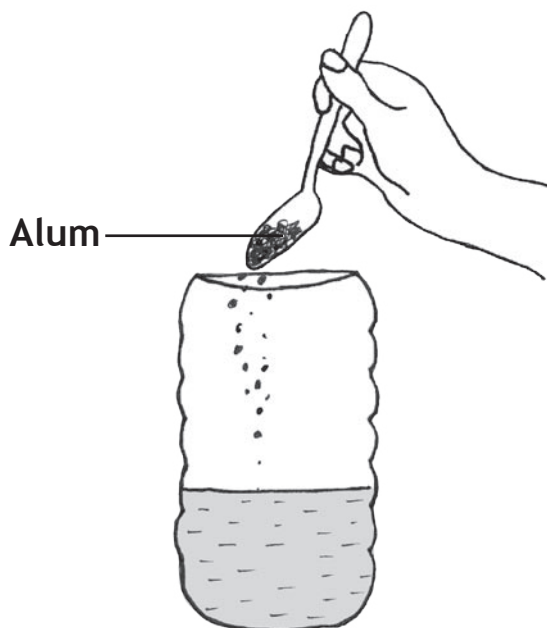
Once you are done, describe your observations and the appearance of the water.

Ex. 3 - Coagulation

Coagulation is the process by which dirt and other suspended solid particles chemically “stick together” into clumps of alum and sediment, so they can easily be removed from water.

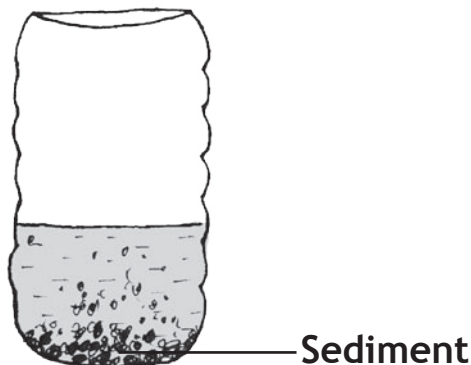
Procedure:

1. Add two tablespoons of alum to the aerated water from Ex.2 .
2. Slowly stir the mixture for 5 minutes. You will see particles in the water clinging together to make larger clumps.



Ex. 4 - Sedimentation

Water can be left for a period of time to allow heavier impurities to settle. This process is called sedimentation. The water on top is then poured out carefully.

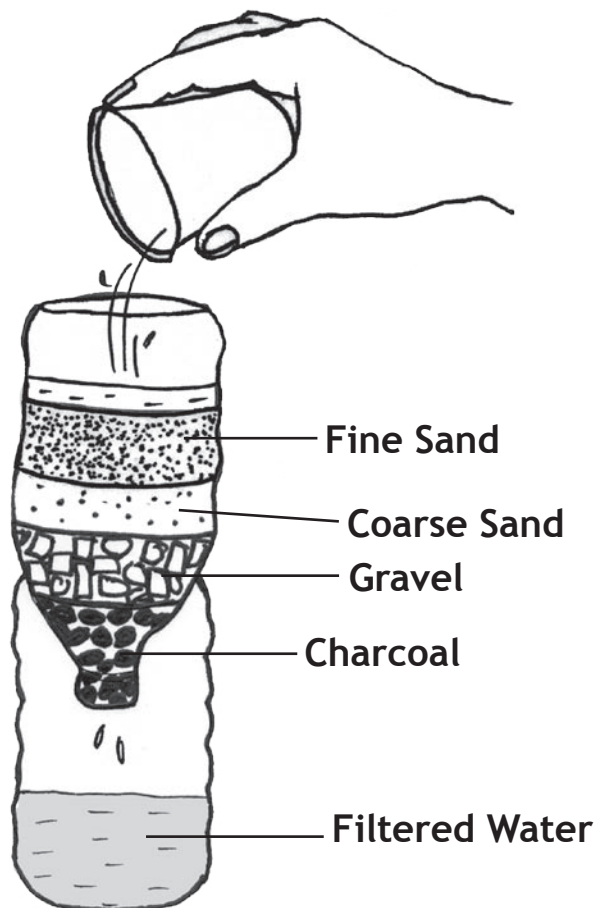


Procedure:

1. Allow the water from Ex. 3 stand undisturbed in the cylinder.
2. Observe the water at 5 minute intervals for a total of 20 minutes. Write down what you see. What is the appearance of the water now?

Ex. 5 - Filtration

Filtration is a process by which the water passes through filters that help remove small particles from it.



Procedure:

1. Cut off the bottom of the bottle.
2. Turn the bottle upside down and pour in the charcoal, gravel, coarse sand, and finally the fine sand.
3. Put the bottle spout into a tall glass or some container that can hold your filter upright.
4. Carefully - without disturbing the sediment - pour some of the dirty water from Ex 4 through the filter slowly.
5. Watch the water seep through the sand and gravel.
6. Compare the treated and untreated water. Has the treatment changed the

appearance and smell of the water?

Charcoal is effective in removing some tastes, odours, and colour. Ordinary charcoal available locally could be used.

In an actual household filter, both the sand and charcoal need to be thoroughly washed and dried in the sun, at least once a year. The charcoal needs to be changed every four years.

Ex. 6 - Disinfection

The final step is to disinfect the water, to purify it and kill any organisms that may be harmful.

Boiling

One simple way to disinfect water is Boiling. Boiling is the best way to treat drinking water as boiling will kill most types of disease-causing organisms that may be present in the water.



Though it might not be possible to do this in class, here are some points to keep in mind while boiling water

1. The water should be boiled in a clean container
2. Water should be boiled continuously for at least 10 minutes (covering the container will help reduce evaporation).
3. Boiled water should be stored in clean containers and always be kept covered.

Chlorination

Another common way to disinfect water is chlorination. The permitted concentration of residual chlorine in chlorinated water is 0.1 - 0.2 mg per litre.

A common source of chlorine is bleaching powder. 2 large tablespoons of bleaching powder are mixed into one 20 litre bucket of water. This is then further mixed with 1000 litres of water to get the prescribed concentration.



Is the drinking water in your home treated in any way?

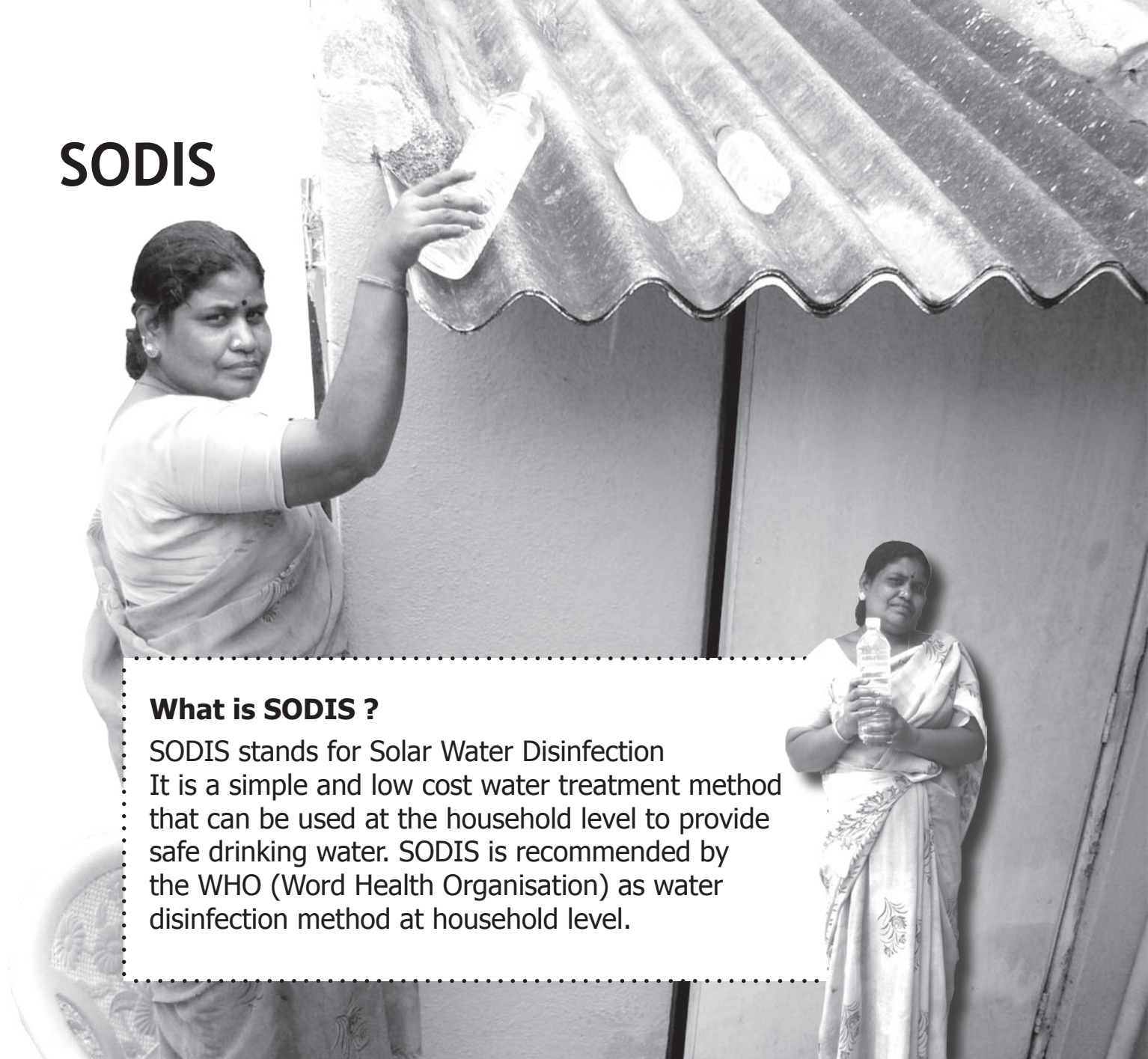
Which of the above processes are used in your home?

Remember.. Even water that looks clean might contain disease causing microorganisms, invisible to the naked eye. All drinking water should therefore be disinfected before consumption !



The above methods of water treatment take care of suspended impurities as well as most types of disease-causing organisms that may be present in the water. They will not be able to remedy dissolved chemical pollutants. These require chemical specific methods of treatment.

SODIS



What is SODIS ?

SODIS stands for Solar Water Disinfection. It is a simple and low cost water treatment method that can be used at the household level to provide safe drinking water. SODIS is recommended by the WHO (World Health Organisation) as water disinfection method at household level.

How does SODIS work?

SODIS is a simple technology to improve the quality of drinking water. It uses solar radiation to inactivate and destroy organic pollutants present in the water. Contaminated water is filled into transparent plastic bottles and exposed to the full sunlight for 6 hours. The UV-A radiation together with a raised water temperature (about 50° C) kills the micro-organisms and makes the bottled water consumable.

Activity

Follow the instructions given below to make a bottle of SODIS treated water.

You will need

- Sunlight
- Transparent plastic bottle with lid (For e.g. A used 1 litre water bottle)
- Clear water - If the water is turbid, it has to be allowed to stand for a while and then filtered with a clean, fine cloth.

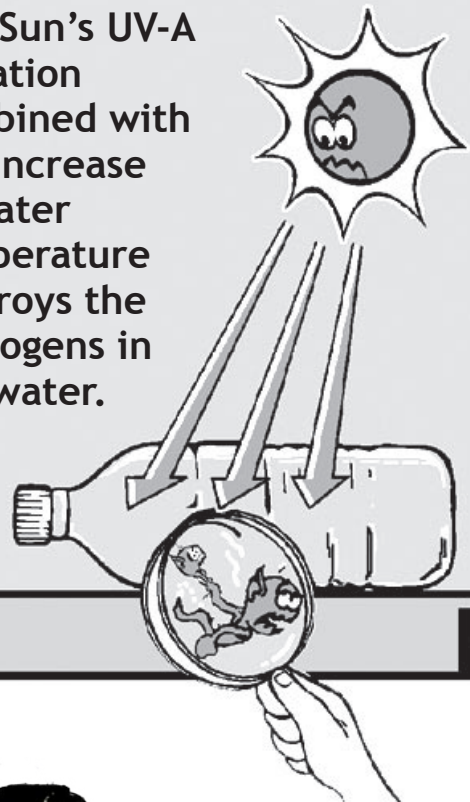
Wash the bottle well, the first time you use it...



Fill the bottle with water, and close the lid well.



The Sun's UV-A radiation combined with the increase in water temperature destroys the pathogens in the water.



Expose the bottles to the sun, morning to evening for at least 6 hours.

Exposure time



6 hours under bright, sunny conditions.



2 days under cloudy sky



SODIS should not be used during days of continuous rainfall as it does not perform satisfactorily in these conditions.



Wonderful !
The water is now ready to drink !

Source: www.sodis.ch

Water Conservation

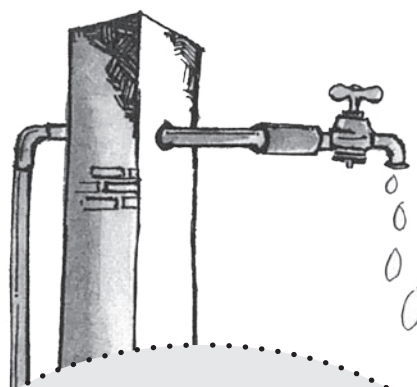
What is water conservation ?

Water Conservation means not taking anymore water from the environment than we need to. Over the years rising population, growing industrialization and expanding agriculture have pushed up the demand for water. So conservation of water has become the need of the day.



Look at the picture below...

What is the problem you can spot?
Who in the village is responsible for maintaining this resource? What is the cause of this negligence? How can it be corrected?



Did you know
a leaking tap can waste
upto 50 lt of water
a day ?
That's 4 whole kudams
of water!



Conduct a survey of all the village's common water taps. A list of all leaky water taps should be made.

-
- Discussion in class:
- Who can be approached to fix the faulty taps?
- Other Suggestions:
- 1. The children write a letter to the panchayat or directly approach them with a request to fix the faulty taps.
- 2. A water committee is constituted that keeps an eye on the neighborhood's taps and is in charge of reporting all faulty ones to the concerned authorities.
-

Things you can do to make a difference

Reduce your water wastage

1. Repair leaking taps
2. Wash vegetables, rice etc. in a bowl, instead of under running water.
3. Water plants early in the morning or late evening to avoid evaporation.
4. Plant drought-resistant plants that require less water.

Reuse used water

1. Use water used for washing vegetables, rice, dhal etc. for watering plants in your garden.
2. Divert kitchen, and bathroom waste water into your garden.
3. Water used to cook vegetables is rich in vitamins and minerals. This water can be reused to cook dhal or rice.



Harvest Rainwater

1. Rainwater should be harvested and stored in a tank for all domestic uses.
2. Excess Rainwater should be directed to recharge pits

Bibliography :

Water

Nehru Bal Pustakalaya, National Book Trust , India

Environmental Education Handbook - Teacher's Resource & Joy of Learning - Handbook of Environmental Education Activities

CEE, Center for Environment Education

Water - The Elixir of Life

C.P.R. Environmental Education Centre

Websites

Water Education – Activities and Teacher Resources

www.nps.gov/archive/wica/Hydrology_PDF.htm

www.watermatters.worldvision.org.nz

www.unicef.org/voy/explore/wes/explore_1818.html

www.epa.gov/safewater/kids/index.html

www.wateryear2003.org/en (Look at the
Education Corner)

Tippy Tap

[www.cdc.gov/safewater/publications_pages/tippy-tap.
pdf](http://www.cdc.gov/safewater/publications_pages/tippy-tap.pdf)

Groundwater

www.groundwater.org/kc/kc.html

[www.bellmuseum.org/distancelearning/watershed/
watershed2.html](http://www.bellmuseum.org/distancelearning/watershed/watershed2.html)

dnr.metrokc.gov/wlr/wq/groundwater-animation.htm
(Animation)

Water Pollution

[www.brainpop.com/science/populationsresourcesanden
vironment/waterpollution/](http://www.brainpop.com/science/populationsresourcesandenvironment/waterpollution/)

SODIS

www.sodis.ch

www.sodis.migros.highscore.ch (Game based on
SODIS)

Rain Water Harvesting

www.rainwaterclub.org

www.rainwaterharvesting.org

We would like to thank
the following :

Auroville Water Harvest

Centre for Water Resource Management

Naidu House, Kottakarai,

Auroville - 605 101

Ph: 0431 2622333, 2622877

harvest@auroville.org.in

www.auroville.org

Mr Lourde Nadin Epinal

Education Co-ordinator

Pitchandikulam Bioresource Centre

Auroville, Tamil Nadu 605 101

Ph: 0431 2622365, 2622431

lourdes@auroville.org.in

Rainwater Club

264, 6th Main, 6th Block, B.E.L. Layout,

Vidyananyapura, Bangalore - 560 097 India

Phone: 91-80-41610190 Email:

rainwaterclub@gmail.com

PMSSS

Pondicherry Multipurpose

Social Service Society

14, St. Therese Street,

Pondicherry - 605 001

Ph: 0413 5201190

Email: pmssspody@hotmail.com

Website: www.pmsss.org.in

&

Mary





ARCHITECTURE & DEVELOPMENT

ARCHITECTURE & DEVELOPMENT (A&D) India, is the counterpart of Architecture & Developpement, an NGO founded in 1997 in Paris. A&D was registered as a Trust in India based in Visakhapatnam, Andhra Pradesh in South India.

A&D works in partnership with many NGOs interested in issues related to Sustainable Habitats in various parts of the world. Involved in activities ranging from reconstruction programs in tsunami affected areas, networking among NGOs, professionals and academia, information dissemination, initiating and implementing exchange programs for professionals and development activists etc. A&D's main objective is to reinforce the competences of professionals so that it will support in affirming their role and responsibility as citizens in society and a pooling of resources, competences and expertise in various fields.

Architecture & Development

#503, Kurupam Towers
Lawson's Bay Colony
Visakapatnam - 530 017

Tel : 0891 2733845

Email : india@archidev.org

Website : www.archidev.org

