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## Objectives

The objectives of this discussion are briefly outlined below.

- To introduce to children that life started in water and to make them aware that the water we use is the same as what the dinosaurs used
- To introduce, through hands on activities and stories the properties of water and the science of water
- To make children aware that they cannot take water for granted and to instill a sense of wonder about how our water comes to us
- To bring an awareness about how our lifestyle affects the available water resource
- To bring an awareness in them that it is a precious resource; no life can exist without water

## Week 0 (Prep week)

### Prep for EVS topic water

During the circle time, invite children to a discussion about their ideas/ understanding on water. They can come up with questions about water (where it comes from, how they use it), the importance of water to all life on earth and to the planet, how our use of water helps or hinders the water cycle, what changes can we make in our life style to help conserve water, how did the Earth come to be called a Blue Planet.

The children will make a drawing/ presentation on their ideas and they will bring it back the next week. These charts/ drawings will be displayed in the classroom throughout the duration of the module.

## Week 1 (Aug 18<sup>th</sup>)

### *EVS Period 1*

#### **Discussion on children's understanding of water**

During this week, we will set up a theme table with books/ pictures on water for the children to read/ look at.

#### **Introduction to the Blue Planet**

Our Earth is three fourths covered with water. It's called the blue planet because it looks blue from space.

Animals need water for drinking, bathing.

Plants need water for their growth.

People need water for drinking, cooking, bathing, and cleaning, for making things and for growing crops.

**Classroom Question:**

Can ALL the water on the planet be used by animals, plants, and people?

*Note to teacher:*

*Reason for this question is to bring about the idea that water is a precious resource, and also how much of the water on the planet is actually potable – the statistic is that less than 1% of water on the planet can be used for drinking. Freshwater is the kind of water that can be used for drinking. Clean water should be colourless, and odourless. Ocean water or sea water cannot be consumed by animals and people – because of the high salt content. Only fresh water can be consumed. For water to be used by animals and people, it should not contain dirt, garbage. In order for water to be clean, we should not wash clothes near the water, or empty drains into the water.*

**EVS Period 2**

**Have you ever tried this with water?**

**Activity #1 : Looking at water**

Fill a glass with water. Taste it, Smell it. Can you smell or taste anything? Clean water is colorless, odorless and tasteless. Can you see through water? What happens (to the water level) when you tilt a glass of water?

Have a pail of water and try to insert a mug into it holding it straight above the water. Can you put the mug under the water like this? What happens when you tilt it and slowly insert it into the water?

**Activity #2 : Will I sink or float**

Explore a variety of objects and find out if they sink or float.

**Activity #3 : Water can dissolve things**

Some things dissolve in water while others don't (dirt vs. sugar). Some liquids mix with water while others don't (honey, oil).

**Activity #4 : Water can climb!**

1. Take water in a glass and dip one end of a coloured handkerchief in the water, Watch after 30 min. How did the handkerchief outside the glass get wet? This happens due to surface tension.
2. Pour some ink in a plate. Keep a stick of chalk standing in the plate. Do you think the ink will climb up the chalk?

### ***EVS Period 3***

#### **Activity #5 : Water finds its level (if there is time)**

1. Join two plastic funnels together with a clear plastic tube. Hold the funnels side by side. Pour water into one of the funnels. What happens? Where are the water levels? Slowly raise one funnel and see what happens.
2. Replace one of the funnels with the jet of a dropper. Hold the dropper jet level with the funnel. Are the water levels the same? Slowly raise the funnel. What happens to the water in the dropper jet? Have you made a fountain? How high a fountain can you make?
3. Put a funnel into a length of clear plastic tubing. Put the other end of the tubing in a jar. Slowly pour water into the funnel until the jar is nearly full. Pinch the tubing near the funnel. Remove the funnel. Put the pinched end of the tubing into a second jar. You have made a siphon. What happens to the water levels? Which way is water flowing?

*Note to teacher:*

*Activity #1 explains buoyancy, translucent nature of water and provides an introduction to weightlessness in water (Archimedes Principle). The other activities explain surface tension. This discussion can be extended to explain how soaps work to clean. The dissolution experiment is also an introduction to weight of water vs. other materials.*

#### **Discussion on use of soaps - hard and soft water**

Water from different parts tastes different. The difference is due to the minerals dissolved in the water.

When water falls to the Earth as rain, some of the water sinks into the Earth, until it is stopped by a layer of non-porous rock. Non-porous rock is firm and solid. Water collects above this layer and saturates the soil. The minerals from the rocks dissolve and mix with the water. The kinds of rocks and the level at which water is found determine the extent of minerals and therefore, extent of hardness of water.

Water that has certain minerals dissolved in it is called hard water. Hard water does not mix well with soap. That is why it is difficult to wash our clothes with hard water and soap. We have to “soften” hard water before we can use it.

## **Week 2** (Aug 25<sup>th</sup>)

### **EVS Period 4**

#### **States of water**

Water sometimes freezes becomes solid. (Ask children to talk of solid forms of water). Sometimes it becomes vapor (what happens to water when it boils). The vapor is hot (like the steam from a cooker). There are three states of water –solid, liquid and gas. Water changes between these three states.

#### **Water Cycle**

We use the same water today that dinosaurs drank several million years ago. The earth has a way of using the same water over and over again.

Water from oceans gets heated by the sun and turns into water vapor. When this happens water becomes a gas. This is called evaporation. When the hot water vapor comes in touch with cold air, the gas changes back to liquid (tiny water droplets are formed). This is called condensation.

*Note to teacher:*

*What do you see when you cover warm milk with a lid? Have you ever walked on grass in the mornings. Why is it wet? The water vapor in the air condenses when it comes in contact with the cool surface of the leaves and is deposited as dew.*

Up in the sky, these droplets of water come together as clouds. As more and more droplets, the clouds get heavier and the water droplets start falling. This is what we call rain. This rain collects in rivers, seas and oceans and evaporates again. This evaporated water comes back again as rain. This is called water cycle.

#### **Classroom Question:**

Does it always rain when there are clouds?

*Note to teacher:*

*No, it rains only when the water vapor in the clouds is too much for the clouds to bear. Have you noticed that before it is going to rain, you feel very hot and sweaty. This is because the overall level of water vapor in the air has become very high.*

#### **Activity #6 : Make your own water cycle - 1**

Easy to make Science Experiments Water Paddles and Boats – Page 6

**Prep for EVS water Period 10 - Life in Water (Use your discretion to see if you need this much time)**

Collect water in a jar and keep it covered on the theme table. Observations on the changes that take place within the jar will be discussed.

***EVS Period 5***

**Activity #6 : Make your own water cycle - 2 (finish if it was not finished last period)**

**Activity #7 : Water Cycle drama**

Read and act the story “ The Water Story”. A separate file will be provided with the story board. Or act out the plot “ Water Cycle Adventure”

**Classroom Question:**

What will happen if water did not evaporate from oceans? What will happen if the water vapor does not meet cold air?

*If there is no cold air, there will be no condensation, no clouds will form and eventually no rains.*

**Classroom Question:**

Ask the children to describe what happens when there is rain – where does the water go, where does it drain.

*Note to teacher:*

*The main source of water is rain. The rain water collects in bodies such as ponds, rivers, streams, lakes, seas.*

*You can also explain how rain water contributes to ground water, and hence the water table - Rain water seeps to the ground and gets stored there – this is known as ground water. This becomes the source for wells, borewells, etc. Also explain that some of the water evaporates and comes back as rain.*

What happens to the water we use? (Toilets, bathing, washing)

All the water gets back to the water cycle. The water used in the toilets is cleaned and sent to the ocean from where it evaporates to come back as rain.

All the water we use comes from rivers, lakes and ponds or ground water. The source of all these is the rain.

**Prep for EVS topic - Water Periods 6**

Children will investigate where their water at home comes from and will either draw the route the water takes to come into their kitchen and bathrooms and out of the house.

### **EVS Period 6**

Discussion on children's investigation into the source of water at home.  
Field Trip to big water tank in Thatguni.

### **Week 3** (Sep 1<sup>st</sup>)

#### **EVS Period 7**

##### **What kind of rain does India get?**

India is a monsoon country. Monsoon means seasonal rains. The cold winds from the Indian ocean carry the water vapor into the land and when these clouds meet the cool air of the mountains, it rains. This occurs between June- September and is called the Southwest monsoon. During winter, the cold air blowing from the north gathers moves the water vapor back to the eastern coast of India and falls as North East Monsoon.

##### **Different kinds of water bodies**

There are different water bodies - rivers, ponds, lakes, streams, seas and oceans.

When the snow melted on mountains it ran down as a stream and gradually the stream gathered more water and became a river. (eg, Ganga, Yamuna). Sometimes, rivers also form from a spring that comes from under the ground (eg., Kaveri).

Lakes are formed when there is a low-lying area and it gets filled with rainwater.

*Note to teacher:*

*The height of the water-saturated layer of soil depends on the amount of rain which has fallen recently. The water table is the line which separates the water-saturated layer of soil from the drier layer of soil above it.*

*When the water table rises to the surface of the ground, a spring is formed. Spring water usually has a lot of minerals dissolved in it. Sometimes a deep hole is dug in the ground to reach the water table. Water then flows into the hole forming a well. Water from wells is usually quite pure. This is because the walls of the well prevent the water from dissolving any minerals from the upper layers of rocks.*

*On the Earth's surface there are many lakes and rivers. Lakes are deep hollows or basins which are filled with water. Rivers are channels of water which flow to the sea or to lakes. Most lakes and rivers get their water from rain and from springs.*

**Read the story of the river Kaveri in class and discuss about how it provides water to Karnataka and Tamilnadu.**

**Activity #8 : The story of Kaveri**

Level 2: Color the pages in the book and draw a river scene of their own.

Level 3: Color the pages in the book and write a summary of what they learned about the Kaveri.

Level 4: Trace Kaveri on the map of India and write a summary of what they learned about the rivers.

***EVS Period 8***

**Rivers and Seas of India**

Read about the other major rivers of India – Ganga, Narmada, Brahmaputra and discuss how they provide water to different regions.

**Activity #9 : The story of other rivers of India**

Level 2: Color the pages in the book and draw a river scene of their own.

Level 3: Color the pages in the book and write a summary of what they learned about the any one of the rivers.

Level 4: Trace the rivers and label the seas on a map of India.

***EVS Period 9***

Continue the discussion on rivers and seas of India

**Week 4** (Sep 8<sup>th</sup>)

***EVS Period 10***

**Life in water**

Read and discuss Nat Geo article from resource file.

**Activity #10 Look for small living things in water.**

Look at the glass jar in which we collected water (this will be found on the theme table). Observe the living things, describe them, and draw what you see. Use a hand lens if you need to.

**Read & Discuss story:**

Homi Bhabha Textbook Class 4, pg. 56 “The Fish Tank”, Children can also put a tune to the song at the end of this story.

## ***EVS Period 11***

### **Living things need water**

Animals, plants and people all need water. The small amount of fresh water is shared by all life.

### **Why do we need water?**

From drinking, washing, gardening, bathing to the water in the juice.

### **Classroom question:**

Why is water important to our body?

*Note to teacher:*

*The human body is made of 70% water. Water helps digest our food, clean our bodies and helps us keep the body cool.*

What kinds of food make you thirsty? What is your favorite drink when you get thirsty? Why do you need more water on a hot summer day?

*Note to teacher:*

*We get thirsty when our bodies do not have enough water to work properly. This happens when we eat salty foods like potato chips, dry snacks and crackers. Our mouths feel dry and we get thirsty. We also feel thirsty when we sweat because we lose a lot of water through our skin. How much water should we drink everyday?*

### **Why do other living things need water?**

Do a comparative study – why do animals need water vs. why do humans need water?

Just like the human body is 70% water, the animals and plants also need water to function. They need water to live, but all of them do not drink water. It's quite obvious that animals and humans need water to survive. But less obvious is the fact that plants need water too. To show this, do the following activity.

### **Activity #11. Plants have water**

Put a large clear plastic bag around some of the leaves of a plant. Tie the mouth of the bag with a thread. Look at it after a few hours.

### **Discussion**

Suppose you put water on the ground around a plant. Does the water reach parts of the plant above the ground?

### **Activity #12 How plants pull water through their stems**

Add ink or food colour to water in a jar. Put some flowering stems (bright coloured flowers is better).

## ***EVS Period 12***

### **Life in water**

Life in oceans vs. life in ponds – why some fish can live in fresh water and some fish can live in salty water.

List all the animals that live in different water bodies and briefly discuss about them.

How water affects vegetation and what are the different types of vegetation?

What kind of vegetation do we have in Karnataka? What grows in Karnataka? What grows in India?

Talk of how animals track water.

## **Week 5** (Sep 15<sup>th</sup>)

### ***EVS Period 13***

Read “The Water Story” (Conservation) – Water resource file3, third story.

Ask the children to draw pictures describing how WE use water in our daily lives.

What are the things we need fresh water for (drinking, cooking, cleaning vegetables)?

Where can we re-use water (eg. Washing floors, gardening).

Level 2: What are the ways we use water and what are the ways plants and animals use water? They can just draw this.

Level 3: Do different kinds of water lead to different kinds of living things around? For example, what will happen if the bund in the school has salty water?

Level 4: If all plants and animals are using water and they all need fresh water, do you think there is enough water on Earth? Can the animals and plants hurt one another by their use of water (for example, will the buffalo have water if all the water is drunk by the elephant)? What could we do to ensure that there is enough water?

### ***EVS Period 14***

Water pollution

#### **Classroom discussion**

*Note to teacher:*

*Share ideas about examples of pollution. Then try to come up with a definition. Help them see that pollution is making something dirty or unsafe for life. Lead into thinking*

*about water pollution. Talk about our oceans, lakes, rivers, and streams. What have they heard or read about pollution in these water bodies? Do they ever think about whether or not the water they swim in is safe? Have they ever been concerned about the fish some people eat being poisoned and harmed from living in polluted water?*

Is your water clean?

Have the children talk about how they use the water - straight from the tap, aqua guard or boiled water?

Why do you think we drink the water straight at school?

When water is unclean, can plants use it? Can animals use the water?

### **Activity #12: Ocean in a bottle**

#### 1. What is pollution?

Share ideas about examples of pollution. Then try to come up with a definition. Help them see that pollution is making something dirty or unsafe for life. Lead into thinking about water pollution. Talk about our oceans, lakes, rivers, and streams. What have they heard or read about pollution in these water bodies? Do they ever think about whether or not the water they swim in is safe? Have they ever been concerned about the fish some people eat being poisoned and harmed from living in polluted water?

#### 2. Which liquids mix with water?

One big problem is that too often our oceans, lakes, rivers and streams can look like they are safe and clean when in fact they are not. Some of the solids and liquids we are dumping into water will mix up with the water so we cannot see them with just our eyes. Some things we put into water will not mix and we can see evidence that they are there. What we cannot see is a big problem!

#### 3. Which liquids won't mix with water?

Today we will do an experiment by making an "ocean in a bottle." We will try mixing different liquids with water to see what will and will not mix. In particular, we will see if oil or detergent will mix with water. Do you think we should drink in water with oil and/or detergent in it? Are these two liquids harmful to plant life, fish or other creatures? Oil and detergents are two common liquids that get dumped into our waters.

### **Activity:**

#### 1. Make a "bottle ocean."

Each student or pair should put 3 cups of water into their clean 2-liter bottle. This is like a little ocean, lake, river, or stream.

## 2. What happens when oil is mixed with water?

Add 1 cup of oil by pouring it into the bottle via the funnel. Screw top on bottle. Mix up the liquids by shaking the bottle. Observe what happens. We observe that oil and water will not mix. We call liquids that will not mix with each other immiscible. What do you think happens when there are oil spills in the oceans? How will oil affect the water, the fish, plant life or animals that live near the water?

You may want to leave the bottle tipped on its side overnight. The next day, see if the oil settled or not. How would this impact our knowing that oil existed in an ocean or lake? How would this help us think about cleaning up oil spills?

## 3. Remove oil and water mixture and rinse out bottle. What happens when soaps and detergents are mixed with water?

Put 3 cups of water in the clean 2-liter bottle. Add 1 cup of dish soap or liquid laundry detergent via the funnel. Screw top on bottle. Mix up the liquids by shaking the bottle. Observe what happens. We observe suds, bubbles and foaming. Do the two liquids combine? When two liquids will mix with each other, we call them miscible.

You may want to leave the bottle tipped on its side overnight. The next day, is the detergent still mixed up with the water or did it separate? Can you still see the foaming and suds? How does this impact our thinking about soapy kinds of pollution?

## 4. What happens when oil and soap are mixed with water?

Empty, rinse and clean the bottle. Add 3 cups of water, 1/2 cup of oil, and 1/2 cup of soap or detergent. Screw on top. Shake the bottle to mix the liquids. Look at what happens. Can you see evidence of the oil and soap? Observe what goes on in the bottle over a period of time. You will find that oil will mix with soap and then with water. This makes it very dangerous for our water systems. Oil can be present and we don't really see it because it got mixed up and broken down with soap and water.

Compare this to trying to wash an oily pan after cooking with it. If you try to use just water, the oil won't come off. But when we add a little dish detergent, we can get rid of the oil. What makes water unclean?

- Garbage
- Disease causing germs
- Waste water from homes
- Waste water from factories

When water becomes unclean, can it be cleaned again?

### **Homework question**

Of the questions listed above, which cannot be avoided and which can be avoided?

## **Week 6** (Sep 22<sup>nd</sup>)

### ***EVS Period 16***

Discuss the homework question.

Read and act out the story “ Saving the river”

### ***EVS Periods 17, 18***

#### **Garbage**

How do you think garbage is taken care of? The biggest landfill is in the Pacific Ocean. The size of the landfill is USA, Mexico and Central America put together. What will happen if slowly the oceans are getting filled with plastic and garbage?

Is it possible to reduce garbage?

#### **Waste water from homes**

How does this affect? If we use a lot of water unnecessarily, then lots of clean water goes down the toilets and bathrooms and has to be cleaned before using again. This wastes a lot of time and energy. To clean the water also, water needs to be used!

When we use cleaning agents, they stay in the water and harm other animals and plants. So, we have to be careful about what cleaning products we use in our home.

#### **Waste from factories**

Lot of waste water from factories also goes to rivers and seeps underground and makes the water unclean.

#### **Classroom Question:**

*Note to teacher:*

*Lead this question to discuss lifestyle choices.*

*Can we do anything about factories?*

*When we buy a bottle of orange juice, there is water being used to make the juice and the water being used to make the bottle.*

*Show the class what is the difference between Ziploc bag and the PET bottle. To make the PET bottle, lots of things are added and that leads to pollution.*

*Note to teacher:*

*The manufacturing process for making a 1-litre plastic bottle uses more than 1 litre of water. When we buy any processed food, the wrapper it comes in causes pollution. Can we think of products that we use that can cause this?*

*So, how can we actually influence the waste from factories? If the products are not made, then there will be no waste. For the factories to stop making products, we need to reduce or stop buying the products that are harmful.*

### **Homework**

Children can make a list of things that they use in a week (mainly related to food, toys) that they use that they can substitute with an environment-friendly alternative. Each child should at a minimum be able to identify atleast one.

Children to draw and/ or describe how what we do affect the Earth everywhere.