

## 3

## WATER AND LIFE



Illustration 3.1

What makes the river say this?

What do we use river water for?

Can river water be used directly for drinking and other domestic purposes?

Analyse the illustration given below.

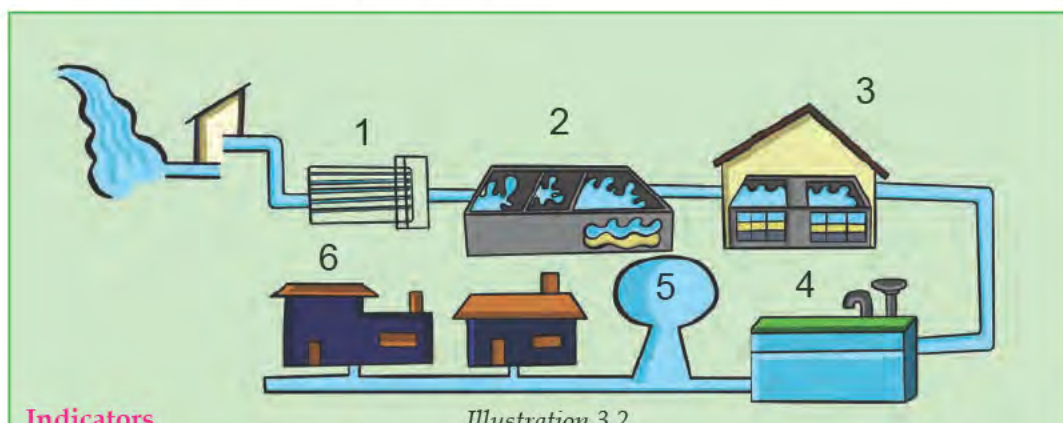


Illustration 3.2

**Indicators**Purification stages of river water

1. Filter out large debris.
2. Allow waste to settle.
3. Strain through multi-layered sieves.
4. Disinfect

Distribution stages of fresh water

5. Store in tank.
6. Distribute water to houses.

The river water gets delivered to the houses after it is being purified.  
Do you get the water regularly in the same way?

What are the other sources of water you depend on?

Write them down.

- Well
- 
- 
- 

How many litres of water do you need in a day?

Take a look at the table showing the approximate amount of water used by one person for various purposes.

### Approximate daily use of water

Use of water	Quantity (in litres)
To drink	2.5 - 3.5
To cook food	3.0 - 4.0
To wash vessels	6.0 - 8.0
To bathe and to wash clothes	30.0
For sanitation	50.0
For other purposes	30.0
Total	121.5 - 125.5



Table 3.1

Compare your daily use with the usage in the given table.

We have seen the daily use of water, haven't we?

We can control and limit the use of certain things, but not the drinking water.





## Increasing demand and decreasing availability

*Availability of fresh water is decreasing due to increase in population and increase in the level of water pollution. It is estimated that 200 crore people in the world do not have access to sufficient amount of fresh water. If this situation continues, it is expected that the water shortage will become more severe in the coming years. Millions of people die all over the world every year due to diseases caused by water pollution.*

For what purpose do you use the water most? How many litres of water do you use approximately in your home per day? Find out and write it in your science diary.

What is the importance of water in our body?

See the approximate amount of water in our body.

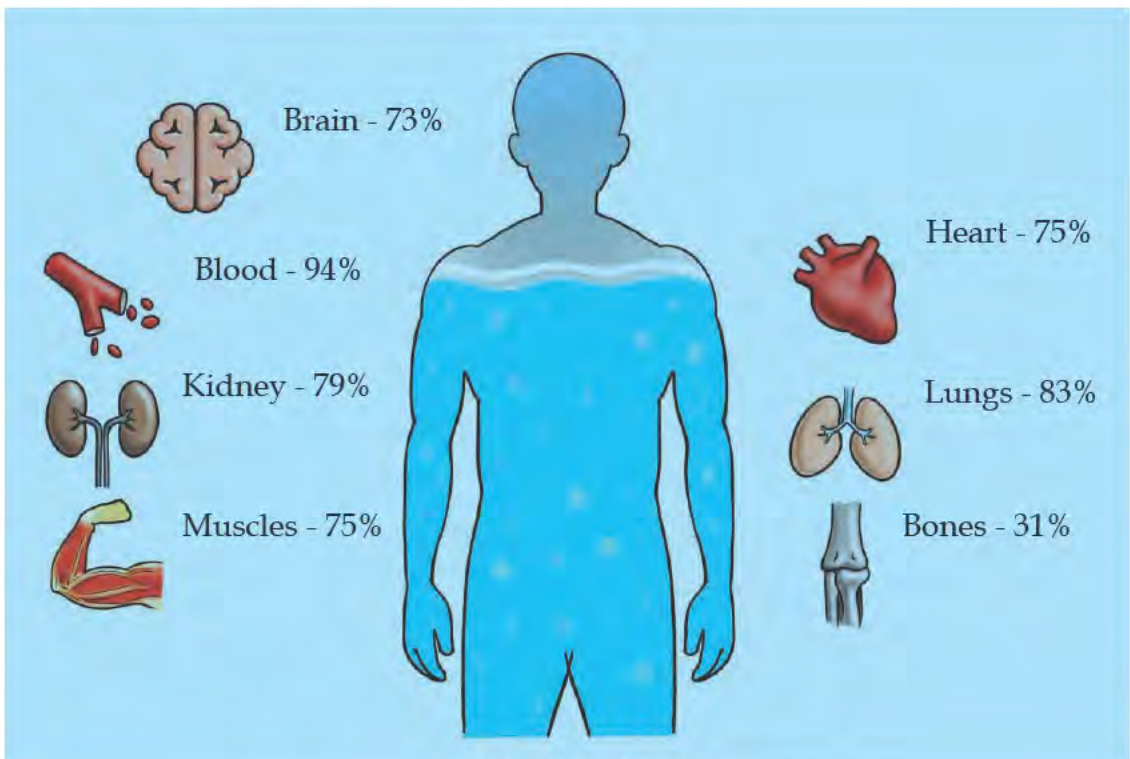


Illustration 3.3

*Water is an important component of the human body.  
Water is essential for all life functions.*

## Water in plants

Plants also need water.

What are the functions of water in plants?

Look at the illustration.

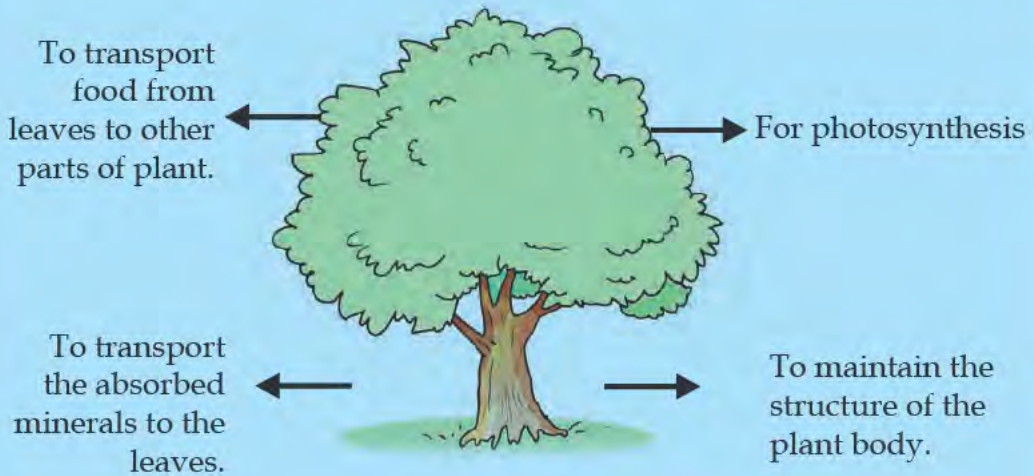


Illustration 3.4

*All living beings need water for life functions.*

## Colour and shape

It does not have colour or odour. So it must be pure water.



Illustration 3.5

Did you notice the child's opinion?  
Do you agree with this statement?



Some information from water quality testing report is given below.

Tested factor	Presence
Colour	No
Odour	No
Bacteria	Yes

Table 3.2

What is the benefit of testing water like this? Discuss.

Write the definition of pure water.

To find out whether the water you are drinking is clean, take a sample of the water and send it to the quality testing labs in your locality to get a test report.

## Does water have a shape?

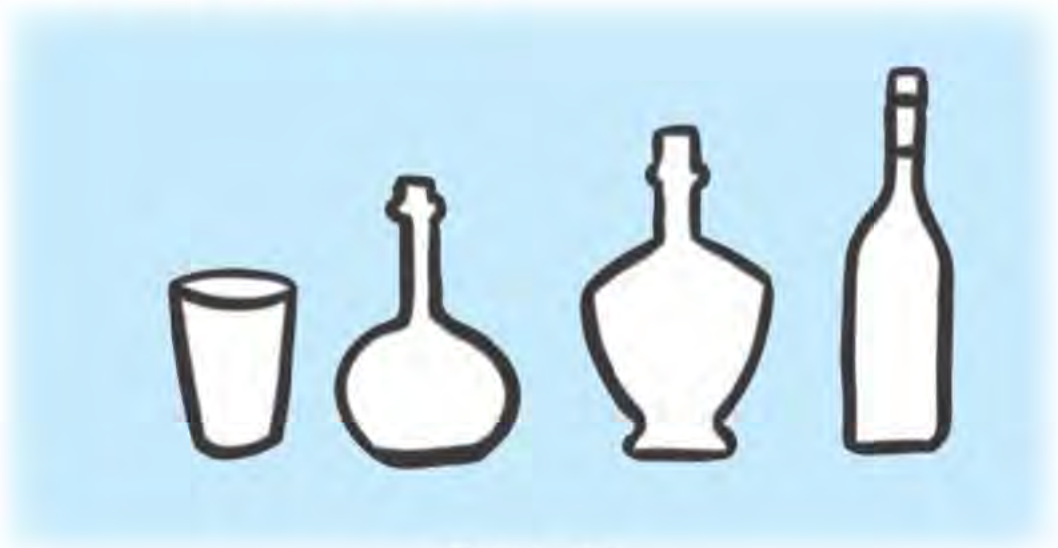


Illustration 3.6

Take water in containers of various shapes. Is there a relationship between the shape of the water and the shape of the container?

Observe the shape of the water in each container and draw it in your science diary.

## Sink or float?

Observe the picture.



Illustration 3.7

Did you see the paper boat floating in the water?

Which of the following objects will float in water?

Can you guess?

Check whether the guesses are correct and mark your findings in the table.

Objects	Guess	Finding (✓ / X)
Stone		
Balloon		
Coin		
Wood piece		
Camphor		
Plastic		
Iron nail		
Leaf		
Wax		
Ice		

Table 3.3



We often utilise the ability of objects to float in water, don't we?  
Write some examples for such situations.

- Rafting
- 
- 

## Soluble and insoluble



Illustration 3.8

Do all substances dissolve in water?

How do we find substances that do not dissolve in water?

Shall we do an experiment using the following items?

*Sugar, salt, vinegar, baking soda, detergent,  
kerosene, coconut oil, wax, camphor, copper sulphate,  
potassium permanganate*

Which of the above substances dissolve in water?

Are there any substances that do not dissolve in water? Write your guesses.

Conduct the experiment and list your findings.

<i>Substance that dissolves in water</i>	<i>Substance that doesn't dissolve in water</i>
<ul style="list-style-type: none"><li>• Sugar</li><li>•</li><li>•</li><li>•</li><li>•</li></ul>	<ul style="list-style-type: none"><li>• Wax</li><li>•</li><li>•</li><li>•</li><li>•</li></ul>

Table 3.4

You have seen that some solids and liquids dissolve in water.

Do gases dissolve in water? Can you guess.

Look at the picture.

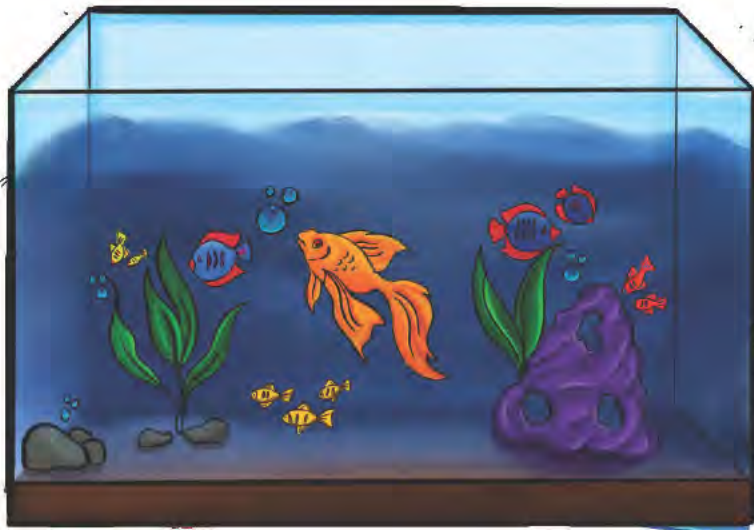


Illustration 3.9

Where do the fishes in the aquarium get oxygen to breathe?





Have you seen the bubbles coming out of the soda bottle when you open it? How is soda water made?



*Soda water is made by dissolving carbon dioxide gas in water. The bubbles are caused by the release of carbon dioxide gas when the soda bottle is opened.*



What was dissolved when the lemon juice was prepared?  
Where did they dissolve in?

*A substance that dissolves is called a solute and the substance in which it dissolves is called a solvent. A solution is formed when the solute is dissolved in the solvent.*

List the solution, solute and solvent in each of the previous activity.

<i>Solution</i>	<i>Solute</i>	<i>Solvent</i>
Sugar solution	Sugar	Water
Soda		

Table 3.5

Find more substances that dissolve in water and expand the table.

How do you remove jackfruit gum and tar if they stick?

Why can't these be washed off with water?

What is the best way to remove ballpoint pen ink on clothes?

Are the substances soluble in water, soluble in kerosene and coconut oil too?



Let's experiment.

Solvent	Solute				
	Sugar	Salt	Baking soda	Copper sulphate	Camphor
Water					
Kerosene					
Coconut oil					

Table 3.6

Analyse the completed table and write down the findings.

*Water has the ability to dissolve many substances.  
Hence water is called the universal solvent.*

Write more examples that take advantage of the dissolving capacity of water.

- To wash clothes
- 
- 

Do the following experiment using water, sugar and ink.

### Situation 1

Take water in two glasses and mix sugar grains in one and powdered sugar in the other.

### Situation 2

Take two glasses of water. Dissolve sugar in the first glass with stirring and dissolve the sugar in second glass without stirring.

### Situation 3

Take hot water in one glass, cold water in another glass and mix a drop of ink in each.

Is there any difference in the speed at which sugar and ink dissolve?

Find out and write down the factors that affect the speed of dissolution of substances.



## Water in many forms

Look at the picture.  
How is ice formed?  
Ice is the solid form of water.



Figure 3.1

What are the uses of ice?

- To preserve food items from spoiling
- 
- 

What happens if the ice is left outside for a short time?

What is the reason for this?

Prepare a note by observing changes that happen to ice in different situations.

What are the different steps included in an experiment note?

Aim :

Materials :

Procedure :

Observation :

Inference :

Situations	Observations
1. When ice is kept in a vessel	
2. When ice is heated	
3. When the water in the vessel boils	
4. When looking at the bottom of the lid of the vessel, after boiling the water	

Table 3.7



Figure 3.2

Analyse the table and write down your findings.

In many situations we use the ability of water to conduct heat. Which are those situations.

- For cooking rice
- 
- 
- 

Haven't you noticed that when water is heated, it rises up as steam? What happens to the moisture in the wet clothes as they get dry?

Discuss.

*The spreading of small particles of liquid from its surface to the surroundings is called vapourisation. As the substance heats up, the rate of vapourisation increases. Vapourisation occurs at all temperatures. Water is the only substance that exists in nature in all the three states : solid, liquid and gas.*

## Water level

Look at the builder who measures the level using the level tube filled with water.



Illustration 3.10

Fill a level tube with water and check the level of different places in your classroom.



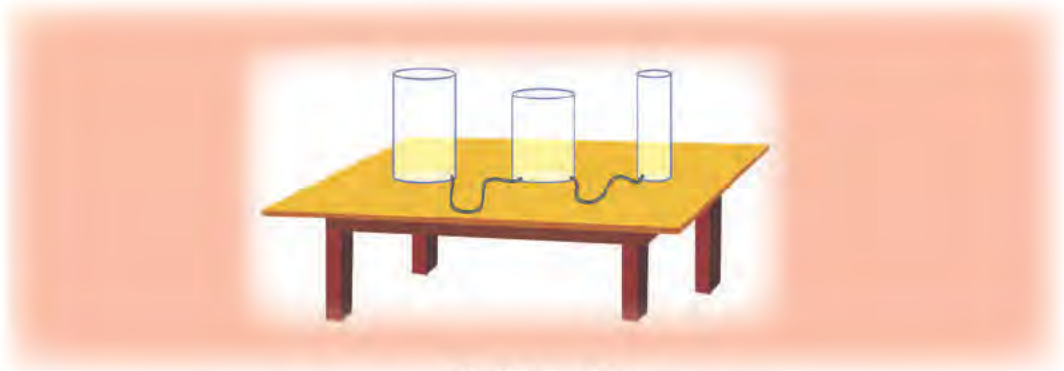


Illustration 3.11

Make the apparatus as shown in the picture. Pour water in any bottle and observe what is happening.

Write your findings in your science diary.

What will happen to the water level in the wells of the nearby houses when water bodies dry up?

Will the uncontrolled use of water by industries affect the availability of water in that area?

Discuss and write down the findings.

*Water maintains its level. This is a property of water.*

## Water sources

Earth is a watery planet.

Observe the pictures. What is the main body of water on Earth?



Illustration 3.12

Sea water contains large amount of dissolved salts, so it cannot be used for daily needs.

Write down the sources of fresh water around you.

Water reaches these water sources through rain.

### **Water drop says..**

*Living beings cannot live without us. As the water bodies get heated up, we rise into the atmosphere. We then get cooled and turn into rain clouds. Then small particles in the rain clouds combine together as raindrops and fall to earth. Thus we become part of water sources.*

Living beings depend on the fresh water available on earth. But some human activities are causing water pollution.

Observe the cases given below.



Figure 3.3

Conduct a class seminar on water pollution and its remedies.



## Let us conserve for future

We are in a place that receives large amount of rainfall. But in summer, there is drought in many areas. If we harvest rainwater, we can ensure water availability even in summer.

Take a look at some of the rainwater harvesting methods illustrated.



Figure 3.4

What other methods can be used for water storage?

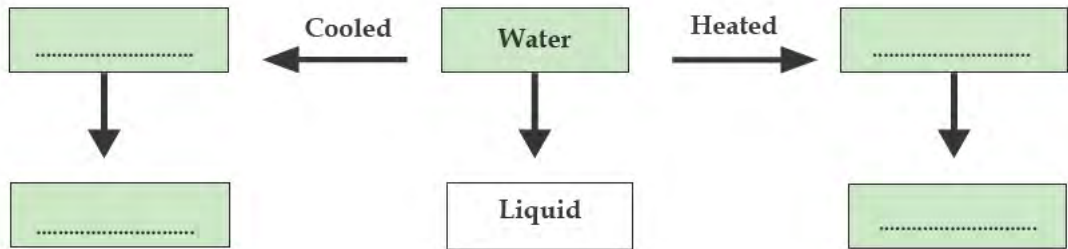
Find out the methods that are being used in your area.

*Pure water is precious.  
Don't waste it.*

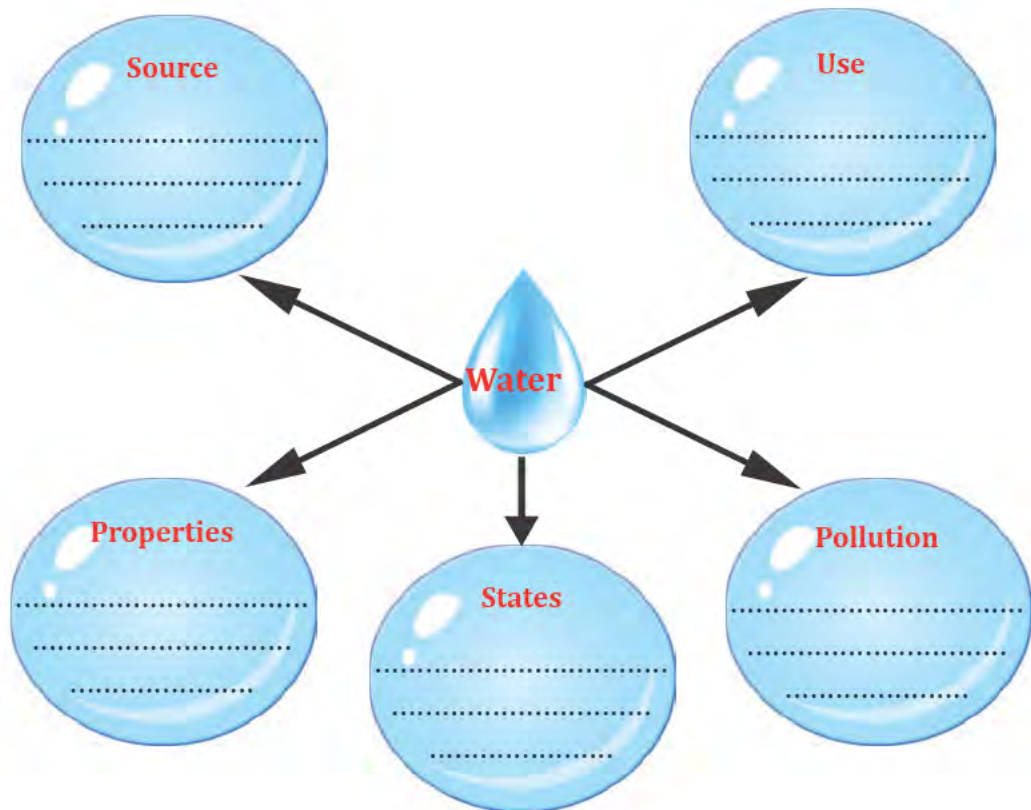


## Let us assess .....

The change in state of water is illustrated below. Complete the flowchart by adding appropriate words.



2. Complete the idea chart made on water.





3. Examine the test report on water quality made on three different sources. Analyse the table and write your findings.

<i>Property</i>	<i>River</i>	<i>Pond</i>	<i>Well</i>
Colour	Muddy	Muddy	Clear
Odour	Foul odour	Foul odour	No odour
Organic waste	Yes	Yes	No
Chemical waste	Yes	Yes	No

- Which source of water is the safest to drink?
  - Can we make river and pond water potable. How?
  - What can we do to prevent pollution of water sources?
4. The properties of water are listed. Find out and complete the table with suitable details from daily life.

<i>Properties of water</i>	<i>Situation</i>
<i>Conducts heat</i>	
<i>Maintains level</i>	
<i>Universal solvent</i>	
<i>Ability to vapourise</i>	





## Extended activities .....

1. What is the main source of drinking water in your locality? Let's conduct a survey. Information should be collected about the sources of drinking water in your house and three neighbouring houses.

Drinking water source	In my house	Neighbourhood houses		
		House 1	House 2	House 3
Well				
Public water supply system				
Borewell				
Rain water storage tank				
Other sources				

Consolidate the information collected by each one and present the findings in the class.

2. Study and prepare a note on your school's water usage.

### Information to be collected

- What are the water sources at the school?
  - How much water is used per day?
  - For what needs?
  - For what purpose water is most used?
  - What practical suggestions can you make for reducing water use at present?
3. Design an apparatus to demonstrate experimentally that water maintains its level.

