



Master Lesson Plan

For

Experiments with Water

Board	Standard	Subject	Chapter	Language	Reference Link	Creation
CBSE	STD V	EVS	Experiments with Water	English	Experiments with Water	2020-10

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Experiments with Water

1. MS_Objectives_Experiments with water

Students will be able to..

- explain the concept of buoyancy
- relate some day to day applications to buoyancy take
- delight on the facts on buoyancy demonstrate an
- experiment to show buoyancy experiment buoyancy
- using a different condition
- discuss the effects on water when substances are added categorise
- the different objects based on their dissolving ability relate the process of
- evaporation to day to day activities
- seek God everywhere
- solve the various questions related to the main concepts in the chapter

Time to teach	Asset Type	Theme	SubTheme
2 Minutes	Main Script	Water	

2. SA_Floating Egg Experiment

Aim: To show that the same object may float or sink depending on how heavy or light the liquid is.

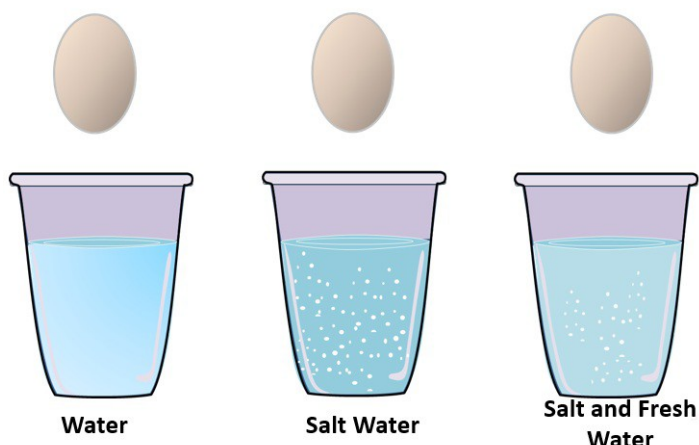
Resources Required: Three glass tumblers, fresh water, salt water, three eggs

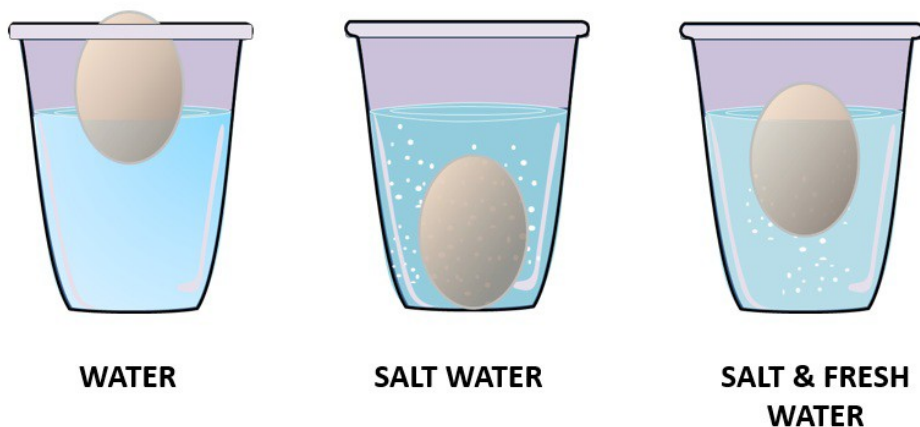
Setting for the Activity: Classroom setting.

Type of Activity: Experiment

Procedure:

1. Take a glass tumbler and pour water into it. Put an egg into the water.
2. Take another glass tumbler. Pour salt water into it.
3. Put an egg into the glass.
4. Take another glass tumbler. Fill half of the glass with salt water and put an egg into it. Observe the results.
5. Add some fresh water into the glass slowly and observe the results.



Observation:

1. In the first case, the egg sinks in fresh water.
2. When the egg is put in salt water, the egg floats.
3. When the egg is put in the third glass, which has water and salt, the egg remains floating in the middle of the glass.

Conclusion:

From this experiment we understand that the egg sinks in fresh water but floats in salt water. This happens because the weight of salt water increases due to presence of dissolved salts.

In the third case, there is a difference between the weight of fresh water and salt water. This causes the egg to sink in fresh water but float in salt water, thereby keeping the egg afloat in the middle of the glass tumbler.

From this experiment we can also conclude that fresh water is lighter than salt water.

Questions to ponder over:**1. Why do these objects float while others sink?**

Answer: Objects float because their weight is less than that of the liquid they are put into. Objects which sink are heavier than the liquids.

2. Why is the weight of salt water more?

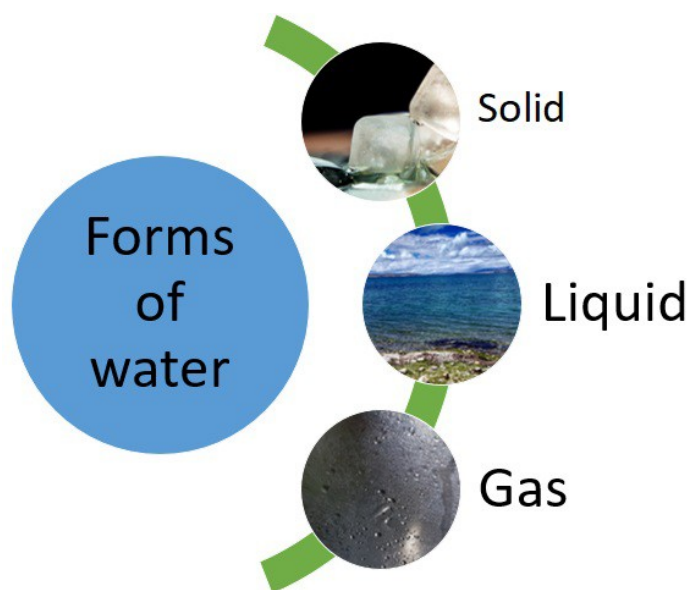
Answer: Salt has dissolved in the water and hence the water weighs more.

Image source- Rushmish@gmail.com

Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Suggested Activity	Water	

3. MS_Sink or Float!

Earth is a blue planet. 71 % of earth's surface is covered with water. Water exists in three forms.



Liquid water is present in oceans, seas, lakes, rivers, ponds, reservoirs, puddles, tanks, etc. Water in gaseous state can be found as water vapour in the atmosphere. When we boil water, it becomes water vapour.

Solid water can be found as snow, ice, frost.

Sink or Float.

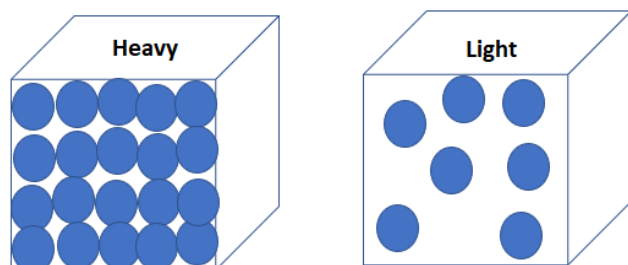
We have seen few things sink in water, while few others float.

For example:

1. If we put a nail in water, it sinks.
2. Soap sinks in water.
3. Soap case floats in water.
4. A plastic bowl floats in water

What could be the reason?

We all know that everything that is present is made up of tiny particles or molecules. In few objects the particles are close together and are very tight and in few others the particles are loosely packed. The objects in which the particles are tightly packed, are heavy and they sink and the objects in which the particles are loosely packed, have less weight and they float.



Let us now think about a huge ship. How does it float on water, even though it is too huge and heavy?

How does the sink and float work?

When the ship or the boat moves in an ocean, it pushes the water aside. As the ship is too heavy, it gets pulled down by attraction force. This means that the ship should sink, when it is pulled by the attractive force or downward force. But it does not happen. There is one more force that acts here. This force is upward force. It pushes the ship from down.

Look at the ice cube in the glass of water. We see that the ice floats on water.



When we put an ice cube in water the ice cube moves some of the water so that it can make some way for itself. As a result, the level of the water increases and the ice partially floats on water. The attraction force or downward force is also pulling the ice cube down. But there is one more force which is acting from down, it is called as the upward force. The upward force pushes the ice cube upwards. The weight of the ice cube will decide how much in or out the ice cube will stay in water. If the weight of the ice cube is more it will sink and if the weight of the ice cube is less it will float.

If an object floats, the upward force balances the force of attraction. When the object sinks, attractive force wins.

Salty Water

Most of the water present on earth's surface is salty. We find salty water in oceans, seas, etc. Oceans cover about 90% of earth's surface. So about 97 % of water present on earth is saline or salty. Ocean water is salty due to minerals washed out of rocks when it rains and the rushing rivers move with extreme force. One such important mineral found in the rock is sodium chloride or common salt. Salt water is heavier. Heavier the water, easier it is for objects to float. Salty water helps boats to float better than they would on fresh water.

Israel's Dead Sea is too salty. Fish in this sea die. But this sea is good for floating.

Look at the man, he is floating on the Dead Sea and reading a newspaper.



Image Source:

Ice: SSSVV Gallery (Keyword: Solid)

Sources of water: SSSVV Gallery (Keyword: Sources of Water)

Water vapour: SSSVV Gallery (Keyword: Solid)

Dead sea: <https://www.flickr.com/photos/azwegers/6738016885> (Attribution: Arian Zwegers)

<https://creativecommons.org/licenses/by/2.0/>

<https://pixabay.com/photos/glass-water-ice-cubes-drink-cold-1206584/>

Time to teach	Asset Type	Theme	SubTheme
10 Minutes	Main Script	Water	Precious Resource, Preciou

4. IA_Facts on buoyancy



- The principle of floating and sinking was discovered by a man named Archimedes.
- In Italy, there was a king Hiero II who lived in Syracuse. This king had asked a goldsmith to make a gold crown for a temple. He gave the goldsmith the desired amount of gold needed for the crown. It was agreed that all the gold has to be used in the making of the crown.
- When the gold crown was done, the goldsmith gave the crown to the king.
- But the king felt that the goldsmith had cheated him and he had not used all the gold given to him in making the crown. He felt that the goldsmith had mixed a cheaper metal like silver in the crown.
- The king called Archimedes to solve his problem.
- Archimedes was taking a bath in his bathtub. When he sat inside the bathtub, he noticed that water came out of the bath tub. That day he realised that when any object is dropped in water, the object takes the place of water, causing the water to spill out. He found that the amount of water that comes out is always equal to the weight of the object.
- Archimedes was so happy to have found the solution, that he ran directly out of his bathroom, naked, through the streets shouting 'Eureka', which means 'I have found it' in Greek.
- Archimedes weighed a bar of gold, a bar of silver, and the crown. He then dropped each of them into the water and measured the amount of the water that came out. He found that the gold took a lot of space of water; the silver, took less space. The crown was in the middle, which proved that the king was right. The goldsmith had cheated the king by mixing silver.

Image source:

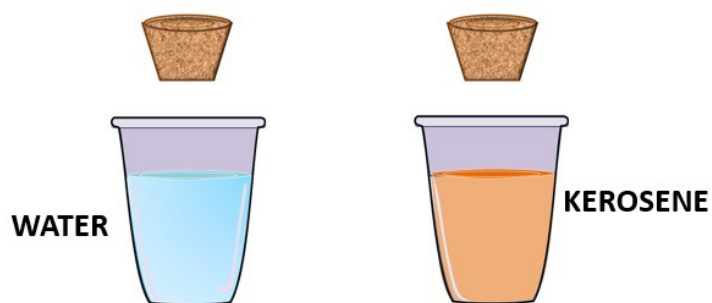
Crown: SSSVV Gallery (Keyword: Crown)

Time to teach	Asset Type	Theme	SubTheme
3 Minutes	Interesting Asides	Water	

5. SA_Cork in kerosene and water

Aim: To show similar objects float or sink depending on the liquids chosen.

Resources Required: Two glass tumblers, two corks of same weight, water, kerosene.



Setting for the Activity: Classroom setting.

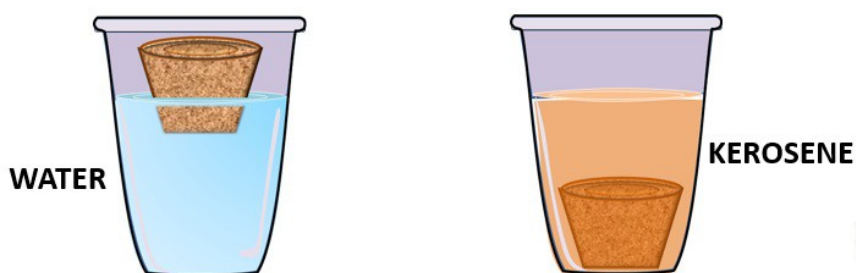
Type of Activity: Experiment

Procedure:



1. Take a glass tumbler and fill it with water.
2. Fill the second glass tumbler with kerosene.
3. Take the two corks and drop one in each of the glass tumblers.
4. Record your observations about the behaviour of the corks in each of the glass tumblers.

Observation:



1. The cork floats in the tumbler containing water.
2. The cork sinks in the tumbler containing kerosene.

Conclusion:

The corks, even though are of same weight, behave differently. This happens because kerosene is lighter than water. Thus cork floats on water but sinks in kerosene.

Image source:

<https://publicdomainvectors.org/en/free-clipart/Blue-water-bottle-vector-image/16809.html>

<https://www.publicdomainpictures.net/en/view-image.php?image=312804&picture=champagne-bottle-cor>

<https://pxhere.com/en/photo/1567819>

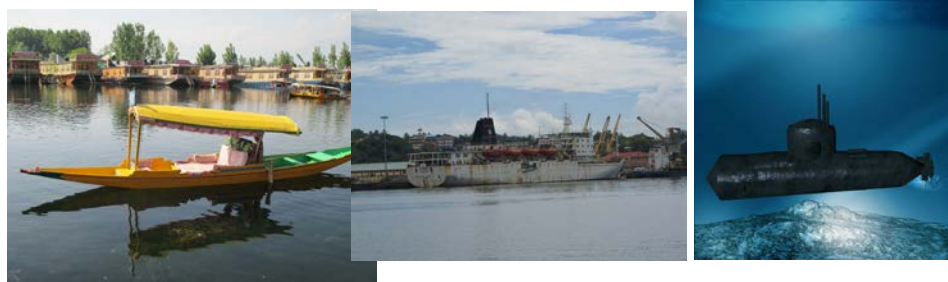
Original Contribution – rushmish@gmail.com

Contribution – rushmish@gmail.com

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Suggested Activity	Water	

6. DD_Buoyancy in daily life

We all see ships, boats, submarines travelling in water. They are able to float on the surface of water because they are made of materials which keep them afloat. They have a wide and large bottom. So when they submerge in water to a small depth, water gives it a lot of upward force, so they float in water.

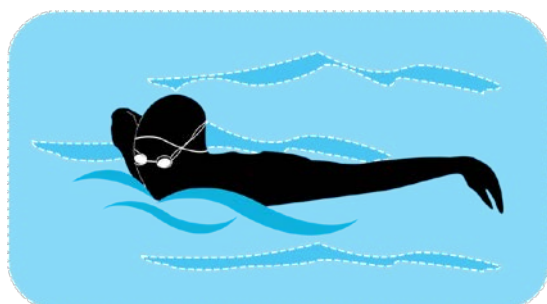


Helium balloons:



We go to parties and see balloons floating up. These balloons are filled with helium gas. Helium gas is lighter than air. So these balloons float high.

Swimming:



We are able to swim in water, because of the upward force. If this force would not have been there we would not be able to learn swimming.

Water plants:



We see few plants such as lotus floating on the surface water. The stem of lotus plants have air filled spaces, because of which they are able to float on the surface of water.

Life boats, and life jackets that we use for our protection in water are based on the principle of buoyancy.



Image source:

Boat: SSSVV Gallery (Keyword: Boat)

Ship: SSSVV Gallery (Keyword: Boat)

<https://pixabay.com/illustrations/submarine-underwater-boat-technology-1879734/>

Birthday: SSSVV Gallery (Keyword: Party)

Swimmer: SSSVV Gallery (Keyword: Swimmer)

Lotus: SSSVV Gallery (Keyword: Lotus)

<https://pxhere.com/en/photo/59830>

<https://pxhere.com/en/photo/1420437>

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Day-to-day Relevance	Pressure & Density	Buoyancy, Buoyancy

7. IQ_What dissolved, what did not?

[Notes to the teacher - Teacher may enable the students to think and come out with as many answers as possible before giving out the right answer/ answers]

1. Seema's mother added two spoons of sugar in her cup of milk. After 5 minutes, Seema looked for the sugar in the cup. She did not find it. Where did the sugar go?

Suggested Answer: When sugar is added to milk it spreads in milk and gets dissolved. Sugar is present in the milk in the form of small particles.

2.If sugar is still present in the water will you be able to separate it from water? How?

Suggested Answer: Yes, sugar can be separated from water by heating the water and allowing it to dry. When the water dries up or evaporates, sugar crystals can be seen.

3.Seema was very excited, so she took a bowl of water and added some soil in it. After 5 minutes, she observed that the soil was still present in the water. Why?

Suggested Answer: The soil does not dissolve in water because the soil particles do not break down further. Soil is insoluble in water.

4.Can you separate soil from water? If so, how?

Suggested Answer: We can separate soil from water, by straining.

5.If a milk man adds water to milk, we will not able to detect it easily. Why?

Suggested Answer: Milk dissolves in water.

6.Suhas wanted to check if the milk man cheated by adding water to the milk. How can he detect if the milk man has added water in milk?

Suggested Answer: Suhas can take two samples, one with fresh milk and the other which is given by the milk man. He can then slide two drops from each sample and slide it on a rectangular glass piece. If the milk is mixed with water it will run faster and reach the bottom faster than the milk which is not mixed with water.

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Inquisitive Questions	EVS_Water	Evaporation, Evaporation

8. MS_Water-a universal solvent

Water is a universal solvent. This means that water is able to dissolve many substances in it.

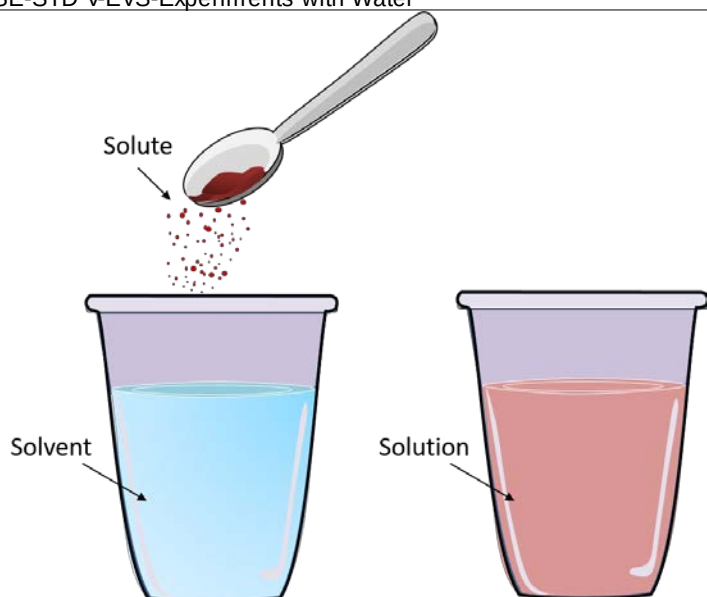
What is meant by dissolving?

Dissolving means, when substances are added to water they dissolve after a while. However they haven't disappeared. They are still present in the water. They are in the form of small particles which we are not able to see. When these substances get dissolved in water we call them soluble substances and if they don't get dissolved in water they are called insoluble substances.

Lets's take an example:

Your mother makes a cup of hot drink for you. She adds sugar in the hot drink. The sugar here is solute, the water is the solvent. When the solute dissolves in solvent it becomes solution.

Solute is a substance (eg: salt) that is dissolved in a solvent(eg: water). Solvent is a substance which is able to dissolve other substances. Eg: Water. A solution is a mixture containing a solvent that is able to dissolve one or more solutes.



The dissolving nature of water helps us in many ways. For example:-

Mud – Transports minerals along with it, makes land fertile.

Soap – removes dirt.

Salt and all other materials add taste to the food.

Let us see what happens when the following substances are added to water.

Let us take a beaker with water and add, oil, food colouring and washing liquid. We can see that not all liquids mix with each other.

Sl no	Given Substance	Solvent	Soluble/insoluble
1.	Sugar	Water	Soluble
2	Mud	Water	Insoluble
3	Chalk	Water	Insoluble
4	Jaggery	Water	Soluble
5	Milk	Water	Soluble
6	Ink	Water	Soluble
7	Soap	Water	Soluble
8	Salt	Water	Soluble
9	Colour Powder	Water	Soluble
10	Baking Soda	Water	Soluble

When substances such as sugar, salt dissolve in water, they can be separated from the water by a process called evaporation. When the water is allowed to stand and is evaporated under sun, it leaves salt behind. This is how we get salt from sea water.



When substances are not dissolved in water, or are insoluble in water then they can be separated by straining with a cloth.

Let's see what happens when we mix water and oil.

Water and oil do not mix together. The oil floats on the top of the water. This is because oil is more thicker/heavier than water. So the oil droplets never dissolve in water.



When substances are added in water the water becomes sticky or thick. In simple words, water is more thin. If we add sugar in it, it becomes thick. This means the water cannot flow faster. It will move slowly.

Let us take two liquids.

Honey and water, allow them to run down a slope. We can see that water will reach the bottom faster than honey.

Image source

Salt: SSSVV Gallery (Keyword: salt-extraction-field)

Immiscible-liquid: SSSVV Gallery (Keyword: immiscible-liquid)

OC: anusha.santhanam@gmail.com

Time to teach	Asset Type	Theme	SubTheme
10 Minutes	Main Script	Matter and Materials in our surrounding	Solubility, Solubility

9. VC_God is everywhere, in everyone and everything

"Could you see the salt after it dissolved in water? If no, why? Does that mean that now the water does not have salt? If it has, then where is the salt?"

Can you see God? If not, does it mean that He does not exist? Just as you cannot see the salt once it gets dissolved in water, you cannot see God who exists in all living beings.

Let us look at this Bengali Folktale

Once a disciple asked his Guru, "Where is God?"

"Everywhere, in everyone and everything," said his Guru.

Later, as the disciple was going home, he saw an elephant charging towards him.

"Get out of the way, get out of the way," shouted the elephant-driver. "He has gone mad!"

But the disciple thought: "God is everywhere. He is in the elephant and he is in me. Would God attack God? No, therefore the elephant will not attack me."

He stood where he was. The elephant picked him up in his trunk and flung him aside. Fortunately, he landed in a haystack and was not too badly hurt. But he was terribly shaken and confused.

When the Guru and the other disciples came to help him and take him home, he said, "You said God is in everything, but see what the elephant did to me!"

"It is true that God is in everything," said his Guru. "He is in the elephant, but he is also in the mahout who kept telling you to get out of the way. Why didn't you listen to him?"

Lesson learnt:

God does exist. But people do not go to Him and do not look for Him in all beings. That's why there's so much pain and suffering in the world.

Time to teach	Value Type	Value Sub Type	Value Attribute
5 Minutes	Truth		Stories

10. DD_Evaporation in daily life!



Rain:

Water from the huge water bodies like oceans, seas, ponds, etc. evaporates in the form of water vapour and forms clouds. On cooling, water drops come down as rain. If water would not have evaporated, then we would not have rains.

Sweat evaporates from our bodies:

When the weather is too hot, we sweat. The sweat evaporates because of the high temperature and removes the excess body heat and we feel cool.

**Water bodies dry up**

In summer seasons we see that few wells, rivers, lakes, ponds, etc dry up. This is because of evaporation.

**Drying our hair after shower:**

When we take a head bath our hair becomes wet. The water vapour from our wet hair evaporates due to the heat of the sun or a hairdryer.

Nail polish remover evaporates:

When we open a nail polish remover bottle we have to close it immediately in order to prevent it from getting evaporated.

Extraction of salt:

We get salt because seawater evaporates leaving behind salt crystals.

Ice cubes melt:

When ice cubes are kept out, they melt and become liquid. It happens because of the increased temperature that evaporates the water, resulting in the change of shape of the ice cubes.

Drying of wet floors:

When water falls on the floor it evaporates, leaving the surface dry.

Cooling down of hot liquids:

The hot coffee or tea cools down after a while. It is because of evaporation. Heat is lost when it evaporates and thus the coffee or the tea cools down.

Ironing of clothes:

We spray water before ironing. The hot iron evaporates the water vapours present in our clothes, which help to iron the clothes well.

Drying of clothes in the heat of the sun:

When we put wet clothes in the heat of the sun, they dry up. The water particles present in the clothes evaporate leaving the clothes dry.

Time to teach	Asset Type	Theme	SubTheme
8 Minutes	Day-to-day Relevance	EVS_Water	Evaporation, Evaporation

11. QA_Experiments with water- A recap!

I. Choose the right answer from the following:

1. An aluminium foil will _____ in water.

a) Float b) Sink

Suggested Answer: Float

2. Oil drop will _____ in water.

a) Float b) Sink

Suggested Answer: Float

3. Rupesh dropped a one rupee coin in water. It _____ in water.

- a) Floated b) Sank

Suggested Answer: Sank

4. Sugar is _____ in water.

- a) Soluble b) Insoluble

Suggested Answer: soluble

5. Sand is _____ in water.

- a) Soluble b) insoluble

Suggested Answer: insoluble

6. Why does an object filled with air float in water?

- a) The air molecules are tightly compacted together b) The air molecules are loosely compacted together

Suggested Answer: The air molecules are loosely compacted together.

7. Objects like wood and sponge float because they are _____.

- a) Less dense b) Heavy

Suggested Answer: a) Less dense

8. Which statement is true?

- a) Not all liquids have the same density b) All liquids have the same density

Suggested Answer: a) Not all liquids have the same density

II. Fill in the blanks with appropriate answers:

1. Ice floats on water because it is less _____ than water.

2. Dead sea is too _____.

3. If the water is salty, objects can _____.

4. Water is less _____ than honey.

Suggested Answer: 1. dense 2. salty 3. Float 4. viscous

III. Say true or false:

1. When we dry clothes in the heat of the sun the water is lost because of transpiration.

2. Iron nail sinks in water.

3. Ship sinks in water.

Suggested Answer:

1. False. When we dry clothes in the heat of the sun the water is lost because of evaporation.

2. True

3. False. The weight of the water displaced by the ship is equal to its weight, so it floats.

IV. Answer the following questions:

1. What are the three forms of water?

Suggested Answer: The three forms of water are solid (ice) liquid (water) gas (water vapour).

2. What is meant by density?

Suggested Answer: Density is a measure of how compact the mass in an object is.

3. What is meant by buoyancy?

Suggested Answer: Buoyancy is the force that acts on an object which makes the object to float or rise upward.

4. Name the universal solvent. What is meant by universal solvent?

Suggested Answer: Water is the universal solvent. A universal solvent is a substance that is able to dissolve many substances in it.

5. Define the term viscous in your own words.

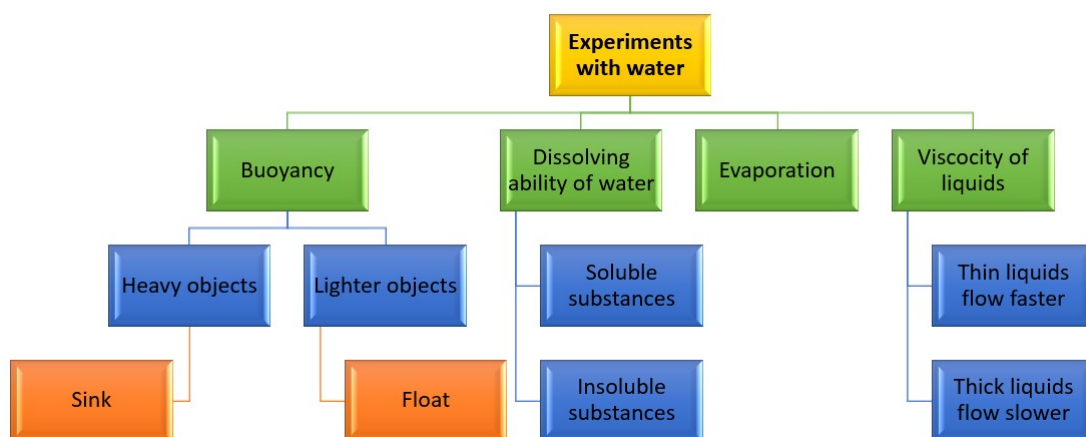
Suggested Answer: Viscous means how thick or sticky any liquid is.

6. Roshni and Sumedha carried out a 'float or sink experiment'. They put six objects into a bucket of water. The objects were made of three different materials: clay, plastic, and iron. Which materials would sink the most in the experiment?

Suggested Answer: Materials made of clay and iron

Time to teach	Asset Type	Theme	SubTheme
10 Minutes	Assessments	EVS_Water	

12. MS_Summary_Experiments with Water



Time to teach	Asset Type	Theme	SubTheme
2 Minutes	Main Script	Water	