



Master Lesson Plan

For

Separation of Substances

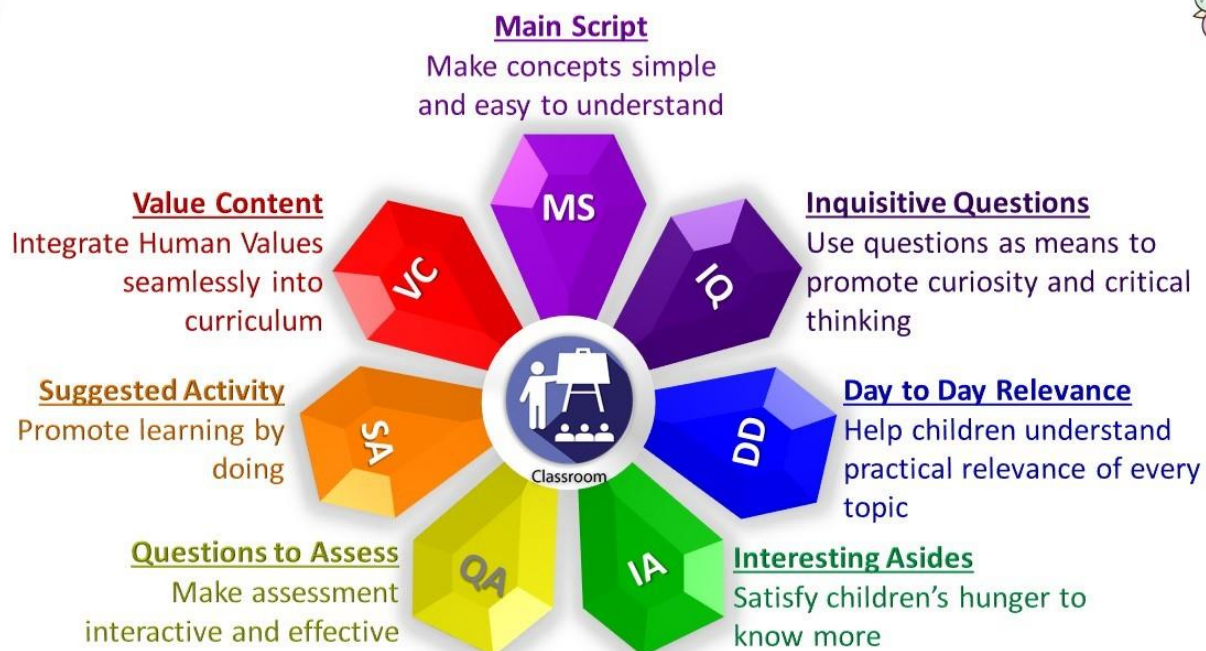
Board	Standard	Subject	Chapter	Language	Reference Link	Creation
CBSE	STD VI	Science	Separation of Substances	English	Separation of Substances	2020-10

DISCLAIMER

- * Strictly not for Commercial use.
- * Provided on 'as is' basis with no warranties of any kind.
- * Content that falls in Public Domain or common Knowledge facts can be used freely.
- * Some of the contents are owned by the Third parties and are used in compliance with their licensing conditions. Any one infringing the Copyright of such Third parties will be doing so at their own risks and costs.
- * Content can be downloaded and used for Personal, educational and informational purposes only. Any attempt to remove, alter, circumvent or distort the data that is accessed is illegal and strictly prohibited.



Master Lesson Plan (MLP) - Covers the entire chapter with the help of these 7 asset types



For more information on how to use the lesson plan effectively, please scroll to the guidelines at the end of this document.

Separation of Substances

1. MS_ Objectives_ Separation of substances

Notes to the teacher: This asset lays down the proposed plan for transacting this chapter. It states the asset objectives of the MLP. This asset is for teacher's reference and need not be taught to the students:

Students will be able to...

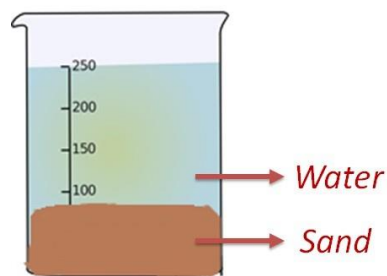
- discover the purpose behind separating mixtures
- explain the methods of separating solids from solids
- notice the process of sieving
- recognise the methods of separation of substances in everyday life
- show the process of sedimentation and decantation
- apply their knowledge on separation of liquids experiment
- the process of evaporation and condensation appreciate the
- extraction of salt
- deduce the meaning of saturated solution
- discuss the process of sedimentation, decantation and filtration
- prepare a saturated solution
- have the advantage of knowing the value of water
- make an indigenous water filter
- connect how large cruise ships get fresh water in the middle of the ocean relish the
- information on kurma avatar
- discriminate good from bad and appreciate other's qualities, through this activity recall the
- topic 'Separation of substances'.

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Is Matter around us pure?	

2. IQ_ Mixture

[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. Ajay is given a glass containing sand and water. His teacher asks him to separate sand from water. How would he separate both of them?



Suggested Answer: Ajay could drain out the water from the glass slowly or use a sieve so that the water drains out and the sand gets separated.

2. Look at the pictures given below. Are they the same? What are they? How can we separate them?



Suggested Answer: These are candies and snacks. They are not the same. They are made from two or more different types of substances. They are mixtures. They can be separated by sorting using our hands.

3. How would you define a mixture?

Suggested Answer: Mixture is a material that is made by the combination of two or more substances that is not chemically combined.

4. Is the air around us a mixture or not?

Suggested Answer: Air is a mixture of number of gases like nitrogen, oxygen, carbon dioxide and water vapour.

5. What is the difference between stainless steel and iron?

Suggested Answer: Stainless steel is an alloy, iron is a metal. Alloy is a mixture of two or more metals.

6. Why do we separate substances or mixtures?

Suggested Answer:

- To separate two different but useful components.
- To remove non useful components.
- To remove impurities or harmful components.

7. Have you ever observed what happens to buttermilk when it is kept without disturbing?

Suggested Answer: You can observe that water will be above the buttermilk in the glass.

8. Why does buttermilk and water separate?

Suggested Answer: Curd used to prepare buttermilk is heavier than water. So, when buttermilk is left idle for some time, curds settle down because of gravity.

9. A glass container contains a mixture of water, sand, salt and iron fillings. How do you think you can separate them?

Suggested Answer: The water can be drained out slowly. The sand could be sieved and dried. After the sand is dried we can separate the iron fillings using a magnet. The water that is separated could be evaporated to obtain the salt.

10. Can you think of some mixtures you observe in your home? Can you name some of the mixtures that can be separated?

Suggested Answers: Lemon juice; salt water; rice with stones; mixture of oil and water, flour with husk.....

11. What do you get when you mix milk, sugar, water, and tea powder together and heat them?

Suggested Answers: After the students answer, it can be mentioned that tea is also a mixture.

Image source:

Original contribution - anjanasri14@gmail.com

CC: bombay mix: <https://commons.wikimedia.org/wiki/File:Bombaymix.jpg> Smarties:

<https://pixabay.com/photos/smarties-confectionery-sugar-candy-50838/>

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Inquisitive Questions	Is Matter around us pure?	Mixtures

3. MS_ Separation of Solids from Solids**HANDPICKING**

Hand picking is a method in which substances in a mixture can be separated by just picking them out with our hands. This method can be carried out in dry conditions and in small quantities.

Hand picking can be used for separating slightly larger sized mixtures based on size, colour, shape, weight, etc. It is usually used for cleaning pulses and rice before cooking.

The advantage of this method is that it does not require any machine for separation. It takes less time when there is small quantity to be separated but very tiresome when the quantity is large. It is possible only when the size of the substances to be separated are different in size and clearly visible.

Other examples

Pieces of dirt, stone, and husk from wheat, rice or pulses, pieces of broken glass can be separated using this method.



THRESHING

Threshing is a process in which the grains are separated from stalks by beating the stalks against a hard surface. Threshing can be done by beating the stalks with sticks on the ground, by allowing bullocks to trample on the stalks or by using machines.



WINNOWER

When the lighter components of a mixture are separated from the heavier ones by wind or by blowing air it is called winnowing.

In this process rice is separated by throwing the mixture into the air so that the wind blows away the lighter husk particles, while the heavier grains fall back down.

This method is usually used by farmers to remove husk from grains.



SIEVING



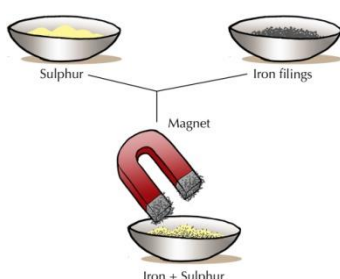
It is a process to filter components of a mixture of different sizes with the help of a sieve. Sieve is a mesh held in a frame. Fine particles are allowed to pass through the holes of the sieve, while bigger impurities remain on the sieve.

In flour mills big machines are used as sieve. Flour is sieved before baking a cake. At construction sites sieving is used to separate stones from sand.



MAGNETIC SEPARATION

Method of separating the components of a mixture by using a magnet is called magnetic separation. This method is used to separate iron filings mixed with the substances.



For example: A jeweller uses a magnet to separate any iron component mixed with gold.

Image Source

OC: manisuper96@gmail.com

Link: <https://www.flickr.com/photos/oatsy40/29188427222/> - <https://creativecommons.org/licenses/by/2.0/> - [oatsy40](#)

[https://commons.wikimedia.org/wiki/File:Threshing_rice_\(5143593270\).jpg](https://commons.wikimedia.org/wiki/File:Threshing_rice_(5143593270).jpg) - Creative Commons Attribution 2.0 Generic - [Nick Hubbard](#)

link: <https://www.flickr.com/photos/graeme/5514894322/> - <https://creativecommons.org/licenses/by/2.0/> - [Graeme Churchard](#)

OC: wsseema@gmail.com

Link: <https://www.flickr.com/photos/gtzecosan/8915941421/> - Creative Commons Attribution 2.0 Generic license - [SuSanA Secretariat](#)

CC: magnetic separation: <https://www.flickr.com/photos/121935927@N06/13579817603> - <https://creativecommons.org/licenses/by/2.0/> - [Siyavula Education](#)

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Main Script	Is Matter around us pure?	Separation of substances

4. SA_Sieving

Aim - To show the process of sieving or sifting.

Materials required: Sift (Sieve), Flour (Wheat or Rice or Maida)

Setting for the Activity; Indoor (classroom activity)

Type of Activity: [Demonstration]

Procedure:

1. Teacher takes some flour and slowly places it on the sieve.
2. She has to gently shake the sieve.

Observation: It is observed that the fine flour sieves down leaving behind the residue or dust particles on the sieve. The impurities are left on the sieve and the flour passes through it and gets segregated in its pure form.

Questions to Ponder:

- 1) Other than household needs, where else is Sieving done?
Ans. At construction sites to separate stones from sand.
- 2) When Sieving is done, only finer particles fall down. What prevents the bigger ones from falling ?
Ans . Since the net in the sieve has small gaps ,only the finer particles can pass through.

Conclusion- This activity helps the students to know the process of sieving.

Instructions to the teacher:

- The teacher has to arrange the materials required for the activity.

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Suggested Activity	Is Matter around us pure?	Separation of substances

5. DD_Separation of Substances in Everyday Life!

Let us now have a look how separation of substances takes place in our daily lives.

- Cleaning rice, grains or pulses (daal) before cooking to remove small stones & sticks and unwanted material is done by hand picking.



- Churning the milk to separate butter.



- Separation of tea leaves using a strainer is a type of filtration.



- Clothes dry because of evaporation.



- Distilled water, alcohol, paraffin and kerosene are produced using the method of distillation.



- Kidneys filter the blood and make urine



- When fibre- rich fruit juices are prepared we see that the solid material settles at the bottom of the container, while the liquid is suspended at the top.



- Purification of jaggery, sugar and tamarind, at home while making sweets is an example for sedimentation and decantation process.
- Separating the husk of the ground nut is done using winnowing.



Image Source

CC: Handpicking: <https://www.flickr.com/photos/mtcgroup/6811657210> (Attribution - MTC Group) CC: Churningbutter:

<https://www.flickr.com/photos/jared422/16565989741> (Attribution - Jared) OC: Seema walunekar @ wsseema@gmail.com

CCO: Drying: <https://pxhere.com/en/photo/778429>

Distilled water: <https://pixabay.com/vectors/distilled-water-liquid-glycerine-5351167/>

Kidney: <https://www.needpix.com/photo/903056/kidney-cross-section-medical-organ>

CCO: <https://pixabay.com/en/fruit-juice-orange-juice-health-2238120/>

https://commons.wikimedia.org/wiki/File:Woman_winnowing_rice_in_Bali.jpg (Attribution - BaliAuthor Shura from Amsterdam, Netherlands)

Time to teach	Asset Type	Theme	Sub Theme
10 Minutes	Day-to-day Relevance	Is Matter around us pure?	Separation of substances

6. SA_ Sedimentation, Decantation and Filtration

Aim: To understand the process of sedimentation and decantation

Resources required: Glass beaker, mud, spoon, water and a glass.

Type of Activity: [Demonstration]

Procedure:

- The teacher can mix some mud in water in a glass beaker and stir it well with a spoon.
- It should be allowed to stand for sometime.
- The teacher can show the class after sometime, the deposition of mud at the base of the glass beaker (sedimentation) and the presence of pure water above
- The water is poured slowly into a glass (Decantation).
- The mud is retained in the beaker.

Observation: It is observed that over a period of time slowly the mud starts settling at the bottom of the beaker.

Conclusion: This activity helps the students to understand the method of sedimentation and decantation. Mud being heavier settles down and the water being light floats above the mud. Thus mud and water can be separated by this method.

Instructions to Teacher:

- All the materials required for the activity have to be arranged one day before the start of the activity.
- Teacher could ask the students to bring the necessary resources.
- Discipline should be maintained during the activity.

Precautions:

Trouble shooting: (If any – Optional)

Activity on Filtration

Aim: To understand the process of filtration.

Resources required:

Mixture of sand, sawdust, water, funnel, beaker & filter paper, stand

Setting for the Activity: [Indoor]

Type of Activity: [Demonstration]

Procedure:

1. Take a filter paper and fold it twice to make a cone.
2. Fit the paper cone into the funnel & fit the funnel to a stand.
3. Pour the mixture of water, sand and sawdust slowly into the funnel.
4. The sand and sawdust remain in the filter paper and the clean water is collected into the beaker.



Observation: The sand, sawdust collects in the filter paper and the pure water is deposited in the beaker.

Conclusion: This activity helps the students to understand the method of filtration using filter paper.

Instructions to Teacher:

- All the materials required for the activity have to be arranged one day before the start of the activity. Teacher
- could ask the students to bring the necessary resources.
- Discipline should be maintained during the activity.

Precautions:

Troubleshooting: (If any – Optional)

Questions to ponder:

1. What are the advantages of sedimentation?

Suggested answer: Sedimentation removes undissolved particles from wastewater. If the density of the particles is greater than that of the water, they sink to the bottom under the force of gravity.

2. What are the advantages and disadvantages of filtration?

Suggested answer:

Advantages

- It is cost effective.
- It helps in the removal of sand particles. It is easy.
-

Disadvantages:

- Germs are not removed.
- It does not make the water crystal clear.

Image source:

<https://www.youtube.com/watch?v=XC1RxloV0Mo&t=173s>Category [Education](#)

License

[Creative Commons Attribution license \(reuse allowed\)](#)

Time to teach	Asset Type	Theme	Sub Theme
20 Minutes	Suggested Activity	Is Matter around us pure?	Sedimentation

7. IQ_ Separation of Liquids

[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. How does your mother make paneer or cottage cheese at home?

Suggested Answer: A few drops of lemon juice is added to boiling milk. The paneer separates and it is removed from the residual whey by straining through a strainer.

2. What happens if oil is mixed in water?

Suggested Answer: Oil is lighter than water. It will float.

3. Is it possible to separate oil from water?

Suggested Answer: The oil on the surface can be removed slowly from the water.

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Inquisitive Questions	Is Matter around us pure?	Separation of substances

8. SA_Separation of Soluble Solids from Liquids

Activity 1.

Aim: To understand the process of separation of soluble solids from solution by evaporation.

Resources required:

Dish, water, Sugar, wire gauze kept on stand & spirit lamp.

Setting for the Activity [Indoor]

Type of Activity: [Demonstration]

Procedure:

(a) Take some sugar and water in a dish and gently mix it, until it gets completely mixed.

(b) Put the dish on a lamp mounted on a stand.

(c) Let the mixture boil for a while till all the water has evaporated.

Evaporation is a process of converting a liquid, into its vapour. When heat is applied the liquid component evaporates leaving behind the solid component.

Observation: After some time you observe that pieces of sugar are left in the dish and water gets evaporated

Conclusion: This activity helps the students to understand the process of evaporation leaving behind the soluble substance.

Questions to Ponder:

1) When water gets evaporated, why does sugar still remain in the flask?

Evaporation takes place only in liquids hence the sugar content remains in the flask.

Instructions to Teacher:

- All the materials required for the activity have to be arranged one day before the start of the activity.
- Teacher could ask the students to bring the necessary resources.
- Discipline should be maintained during the activity.
- Teacher can then explain the process of evaporation to the students.

Precautions:

Care has to be taken while operating the lamp.

Troubleshooting: (If any – Optional

Activity 2

Aim: To understand the process of evaporation and condensation to extract the solvent from a solution.

Resources required:

Salt, beaker, water, conical flask, Bunsen burner, delivery tube, test tube, ice cubes.

Setting for the Activity: [Indoor]**Type of Activity: [Demonstration]****Procedure:**

- Take the salt solution in a conical flask and attach a delivery tube and then heat it strongly.
- The water vapour is allowed to pass through the delivery tube whose end is dipped into a test tube.
- Then place the test tube inside a pack of ice cubes. The water vapour cools, it condenses into water. The salt remains as residue in the conical flask, once all the water gets evaporated.

Observation: It is observed that when the vapours of a substance get cooled, they condense into liquid. .

Question to ponder:**1)What is the difference observed between evaporation and Condensation ?**

As water gets heated up, it changes from liquid to water vapour. On cooling the same water vapour condenses to become droplets of water.

Conclusion: This activity helps the students to understand the process to obtain the solvent from the solution.

Instructions to Teacher:

- All the materials required for the activity have to be arranged one day before the start of the activity.
- Teacher could ask the students to bring the necessary resources.
- Discipline should be maintained during the activity.
- Teacher can then explain the process of condensation.

Precautions:

- Care has to be taken while operating the lamp.

Troubleshooting: (If any – Optional)

Time to teach	Asset Type	Theme	Sub Theme
20 Minutes	Suggested Activity	Is Matter around us pure?	Evaporation, Condensation

9. IA_ Extraction of salt from Sea Water

Salt is extracted from salty sea water using the process of evaporation. Sea water is left to evaporate in the sun, leaving the salt behind.

- Sea water is allowed to flow into shallow flat beds through channels that are then sealed off.
- Seawater gets heated up during day time due to the heat of the sun.
- When all the water gets evaporated, salt is left behind in heaps.
- The salt is collected and cleaned.
- Salt is extracted from salty sea water using this process.

Time to teach	Asset Type	Theme	Sub Theme
2 Minutes	Interesting Asides	Is Matter around us pure?	Evaporation

10. IQ_ Saturated Solution

[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) How can you dissolve more salt in an already saturated salt solution?

Suggested Answer- Heating the solution will enable more salt to dissolve in the saturated solution.

2) Is the amount of water needed, the same for dissolving equal amount of different substances ?

Suggested Answer- No, the amount of water needed to dissolve equal amount of different substances will vary from substance to substance.

3) What do we call a substance that cannot dissolve a substance anymore?

Suggested Answer: Saturated solution.

Time to teach	Asset Type	Theme	Sub Theme
3 Minutes	Inquisitive Questions	Is Matter around us pure?	Saturated solution

11. MS_ Separation of Insoluble Solids from Liquids

Have you wondered why your mother soaks rice grains in water before cooking them?

The rice grains being heavier settle at the bottom and the upper layer of water which contains dust and other impurities are decanted away

Sedimentation is a process in which heavier particles of an insoluble solid in a liquid or in a mixture settle down and lighter particles come to the surface of the container.

The solid particles called sediments settle down forming a layer. Sedimentation is followed by decantation.

Decantation is the process of pouring out of the upper liquids into another container without disturbing the settled sediments.



Sedimentation



Decantation



Filtration is defined as a process in which larger particles or insoluble solids are separated from a liquid using a filter. A filter is a medium with very fine pores such as a strainer used to strain tea.

Image Source
OC: wsseema@gmail.com

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Is Matter around us pure?	Sedimentation

12. SA_ Demonstration of Saturated Solution

ACTIVITY I

AIM- To show that more salt can be dissolved in a saturated solution by heating.

MATERIALS REQUIRED- Beaker, water, salt, Bunsen burner.



Salt crystals



A glass of water

Setting for the Activity [Indoor] : Indoor (classroom activity)

Type of Activity: [Group activity]

PROCEDURE-

1. Take some water in a beaker and add salt in it. Add some more till the water cannot dissolve any salt in it.

2. This is saturated salt solution.
3. Keep the solution on the Bunsen burner and heat, add more salt.

OBSERVATION: We observe that when heated, the solution dissolved salts in it.

Question to Ponder

1. When is a solution called saturated solution?

Ans. A solution becomes saturated when no more substance can get dissolved in it.

CONCLUSION- On heating a saturated solution, more of a substance can be dissolved in it.

ACTIVITY II

AIM- To show that water dissolves different substances in different amounts.

MATERIALS REQUIRED- Four glasses, four spoons, salt, sugar, turmeric powder and gram powder.

PROCEDURE-

1. The class is split into 4 groups and the groups are given salt, sugar, turmeric powder and gram powder respectively; a glass and spoon for each group and some water.
2. Each group has to put a spoonful of the substance that they have got in half a glass of water and stir that well.
3. They have to record it in the following table, the number of spoons they added to make the glass of water saturated.

SUBSTANCE	NUMBER OF SPOONS
SALT	
SUGAR	
TURMERIC	
GRAM	

OBSERVATION- It is observed that salt gets dissolved.

Question to ponder:

- 1) Why does it take different quantities of water to dissolve different substances ?

Ans. Every substance has a definite capacity to absorb water and get dissolved. A few substances like salt and sugar may not need more water, but substances like gram powder and turmeric need more water to get dissolved.

CONCLUSION- The above experiment shows that water dissolves different substances in different amounts.

Image source

<https://pixabay.com/photos/salt-spa-wellness-wood-1884166/>

<https://pixabay.com/photos/calm-water-clear-drink-glass-2315559/>

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Suggested Activity	Is Matter around us pure?	Saturated solution

13. IA_ Cheaper in water than on land

Believe it or not! It is cheaper to generate fresh water on a voyaging ship than in a factory on land! Strange but true!

Fresh water generation or desalination in large quantity is expensive. Cost of fuel required to evaporate a large volume of saline water to produce pure water is high. On the other hand, when a ship is sailing, its huge engines which propel the ship generate enormous heat and thus need to be cooled by constantly pumping sea-water around their manifolds. This circulating sea-water absorbs all the heat but itself becomes steaming hot and has to be discarded into the sea. Unless this steaming hot water can be put to some good use! Why not? That is what the fresh water generators are waiting for!

This discarded steaming hot sea-water can now be used to heat the sea-water to be desalinated to reap a rich harvest of fresh water.

Which means: A desalination plant on land has to pay a high fuel cost whereas a voyaging ship gets it free! Do you now agree, it is cheaper in water than on land?!

Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Interesting Asides	Matter and Materials in our surrounding	Evaporation

14. SA_ Make a water filter

Aim: To make an indigenous filter.

Materials required:

- A clear plastic bottle
- 1/2 cup dirt
- 2 cups sand
- 2 cups gravel
- glass of water
- spoon

Procedure:

1. Cut the bottom of the bottle about two inches from the bottom. This part can be dangerous, so it is good to get help from an adult for this part. Leave the cap on it.
2. Turn the bottle upside down so that you can pour the gravel in it. It works best if you put larger gravel in first because it plugs up the hole that is capped.
3. Pour the sand over the gravel. It will fall through the gaps in the gravel.

4. Mix the dirt in the water.
5. Pour the dirty water on the top of the sand in the bottle.
6. Carefully take off the bottle cap and put the bottle spout into a tall glass or some container that can hold you filter upright.

Observation: We see the water seep through the sand and gravel and the layers get darker as the water flows down through them.

Question to ponder :

1) What makes the water that seep down clear?

The dirt in the water gets filtered down through the gravel and sand.

Conclusion: The layers of sand and gravel help to get rid of the dirt in the water and pure water is obtained.

Time to teach	Asset Type	Theme	Sub Theme
15 Minutes	Suggested Activity	Is Matter around us pure?	Filtration

15. IQ_ Fresh water generators

[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. How do large cruise ships get fresh water in the middle of the ocean?

Answer: In the olden days success or failure of a ship's voyage depended on how much of fresh water the ship could carry.

As the poem goes:

Water water everywhere but not a drop to drink, was really true.

But modern innovations have made all those fears disappear forever! These days the ships get fresh, drinking water by desalination of saline water of the sea. Desalination means getting rid of salt from the salt water.

Time to teach	Asset Type	Theme	Sub Theme
2 Minutes	Inquisitive Questions	Matter and Materials in our surrounding	Evaporation

15. VC_ Good Hands

Learning Domain: Classroom

Introduction

Separation of materials means a substance being separated from a mixture of materials. Using different methods like threshing, winnowing, sieving, hand picking etc., we choose what we need or remove what we do not need. In the same way we must use our discrimination to differentiate good or positive qualities from bad or negative qualities and appreciate and promote positive qualities in ourselves and others. The ability to discriminate between good and bad, is what separates human beings from animals. A man or woman can make his or her life more meaningful by imbibing good qualities and always seeing the good in others and by removing the bad qualities in themselves.

Group Activity

Procedure:

Divide the children into groups of six and make the children sit in individual circles. Let us consider

A, B, C, D, E, F

A will draw the outline of his / her palm on a paper and write his / her name and give it to B. Obviously, a child will not write positive quality about himself / herself. B will write some positive quality about A and pass it on to C. C will write some positive quality about A and pass it on to D..... E F. Finally when it reaches A, he / she will see what other 5 children (B,C,D,E,F) think about him / her.

Same with other children. B's positive quality will be written by C,D,E,F,A. C's positive qualities will be written by D, E, F, A, B....etc.

The children will identify the person by looking at the name in the paper & write the positive qualities about them.

Finally, each child gets to read his/her positive quality which will be a source of motivation for them.

Conclusion:

As you make it a habit in finding positive aspects in other people, you get better in seeing positive aspects of yourself. Seeing and appreciating the good in other people is not just necessary for making others happy, it also greatly improves your own happiness.

Time to teach	Value Type	Value Sub Type	Value Attribute
10 Minutes	Truth		Group Activities

16. QA_ Separation of Substances - My Knowledge

I. Choose the right answer:



- a. Threshing
- b. Winnowing
- c. Handpicking
- d. Straining

2. Identify the picture:



- a. Threshing
- b. Winnowing
- c. Condensation
- d. Separation

3. Identify the picture:



- a. Straining
- b. Sieving
- c. Evaporation
- d. Sublimation

4. The following picture is an example of:



- Sedimentation and Decantation
- Decantation and Sublimation
- Sedimentation and Sublimation
- Sublimation and Evaporation

5. The following picture is an example of :



- Condensation and sublimation
- Condensation and crystallisation
- Evaporation and Condensation
- Separation of tea from its leaves

II. Match the following:

1. Filtration	a. Washing of vegetables with water
2. Distillation	b. Removing straw and dust from food grains
3. Sublimation	c. Separating iron from waste
4. Decantation	d. Carbon dioxide gas to dry ice
5. Winnowing	e. Straining coffee powder from coffee
6. Magnetic separation	f. Making salt from sea water
7. Evaporation	g. Getting kerosene from crude oil

Answer: 1E, 2G, 3D, 4A, 5B, 6C, 7F

III. Fill in the blanks:

1. _____ is used in injections.
2. _____ is the process of removing insoluble particles from a liquid.
4. The method used traditionally to remove stones from rice, dal, etc. is _____.
5. Separation of mixture by gravity is called _____.
6. _____ is used in packaging cold food.
7. Lighter particles present in a mixture can be separated by -----.
8. The iron particles can be separated from sooji/rava/semolina by the method of -----.
9. ----- is a process in which a liquid changes into its vapour on heating.
10. Formation of rain involves these two processes ----- and -----.

Suggested Answers: 1. distilled water, 2. filtration, 3. handpicking method, 4. decantation, 5. dry ice/solid carbon dioxide, 6. Winnowing, 7. Magnetic separation, 8. Evaporation, 9. Evaporation, and condensation.

IV. Answer the following questions:

1. Can salt be purified?

Suggested Answer : By crystallisation

2. What is sublimation?

Suggested Answer: It is the process of converting a solid into gaseous state by heating without melting to liquid.

3. What happens when ammonium chloride is heated?

Suggested Answer : Ammonium chloride vapours rise above and get deposited on the cooler side of the beaker.

4. What are the different methods of separation of mixtures?

Suggested Answer: Hand picking, winnowing, sieving, filtration, sedimentation, decantation, magnetic separation

5. What is sediment?

Suggested Answer: A heavier component of mixture that gets settled at the bottom is called sediment.

6. What is filtrate?

Suggested Answer: The clear liquid left after filtration.

7. What are the uses of evaporation?

Suggested Answer : It is used to separate a salt from its solution.

8. How can you separate chalk powder and water?

Suggested Answer : By filtration method we can easily separate chalk powder and water.

V. Give one word:-

1. The process of separating the grains from the stalk by beating.
2. Soil particles settling at the bottom of the container in a mixture of muddy water.
3. When different components are mixed together.
4. Separating grass from a bunch of pudina.
5. A mixture in which the components are seen and not uniformly distributed.

Suggested Answers: 1. Threshing 2 Sedimentation 3. Mixture 4. Hand picking 5. Heterogenous

B. Match the following:-

<u>Mixture</u>	<u>Process</u>
1. Mud water	Magnetic separation
2. Stones in rice	Filtration
3. Floating impurities	Sedimentation
4. Chaff from grains	Winnowing
5. Iron in rice	Hand picking

Suggested Answer: a. Sedimentation b. Hand picking c. Filtration d. Winnowing e. Magnetic separation

State True Or False

- 1) Solid in liquid --Sugar solution
- 2) Gas in gas is called air
- 3) Magnet is used to separate smaller particles .
- 4) Gas in liquid -- soft drink
- 5) Salt cannot be separated from salt solution.
- 6) A mixture of water, salt, sand and saw dust can be separated by one method.
- 7) Pure water can be obtained from sea water by filtration.

Suggested Answers: 1) True 2) True 3) False 4) True 5) False 6) False 7) False

Rapid Round

A . Which separation process is used when one component in a mixture is-----

- a) One is soluble in water and the other is not
- b) One is lighter than the other
- c) Of different shape and colour from the other
- d) One is bigger than the other
- e) One sinks and the other floats

Suggested Answers: a) Filtration b) Decantation c) Hand picking d) Hand picking e) Sedimentation & Decantation

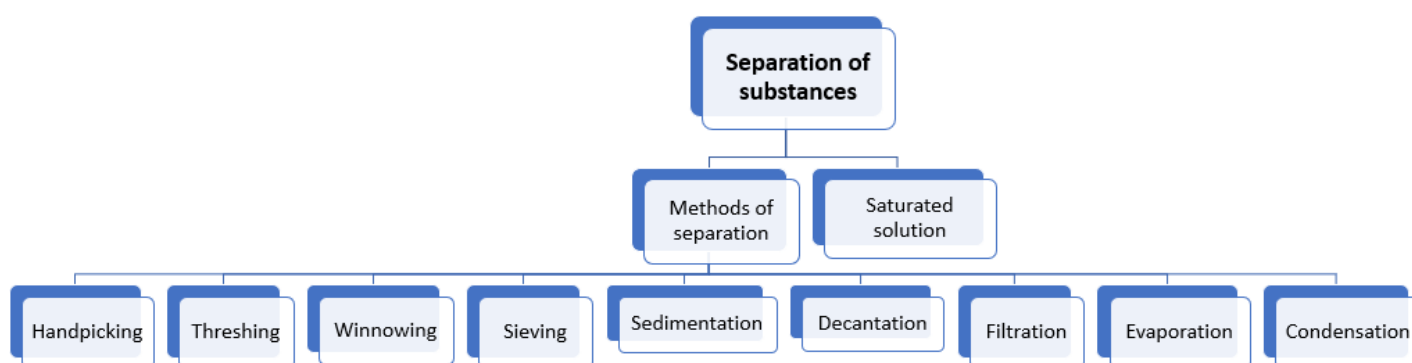
Image source:

Threshing: Original Contribution: Drawn by VAST Team Winnowing: Drawn by VAST Team

Sedimentation and decantation: Drawn by VAST Team Evaporation and condensation: Drawn by VAST Team Seiving: OC: sreevalsam.gopinath@gmail.com

Time to teach	Asset Type	Theme	Sub theme
15 Minutes	Assessment	Is matter around us pure?	Seperation of Substances

17. MS_Summary_Separation of substances



Time to teach	Asset Type	Theme	Sub Theme
5 Minutes	Main Script	Is Matter around us pure?	Filtration, Evaporation, Decantation, Condensation

Master Lesson Plan

Seven Asset Methodology for MLP	
What is the purpose of this Master lesson Plan?	This Master Lesson Plan (MLP) prepared by Sri Sathya Sai Vidya Vahini, covers the entire chapter for the given board. The chapter given in the textbook is broken down into smaller modules known as assets. One of seven teaching methods is applied to each asset. Several different assets together complete the entire chapter. Each asset is supported by a teaching aid such as animated presentation, audio, video, worksheet; that the teacher can use in the class, while teaching that module. The MLP is for the teacher's preparation and the teaching aids are for use in the classroom.
How to use it?	You can prepare for your class with this MLP by following 3 simple steps: 1. Read your textbook; 2. Go through the information given in the assets (document & multimedia); 3. Prepare your teaching notes. Great! Now you are ready to transact the chapter.
Duration	Kindly note the duration given for each asset. Due care has been taken in planning the assets, to ensure the chapter is completed within the time specified by the Board. Note: Preparation time is not included in the asset duration. The teaching time depends on the duration of the teaching aids and is not impacted by the length of the MLP.
What is a 'Main Script' (MS) Asset?	The Main Script asset is there for explaining the main concepts of the chapter clearly. The information given in the textbook is simplified, organised and structured to give more clarity. Additionally, you may find a video or mnemonics or a graphic organiser to deepen the understanding of the concept.
How to teach using the MS asset?	Please use the blackboard, slides and interaction to develop the concept.
What is an 'Inquisitive Questions' (IQ) asset?	The Inquisitive Questions asset uses questions to promote higher order thinking like the n^{th} why, what-if, new perspectives, cause-effect, and others, creating curiosity.
How to teach using the IQ asset?	You may use the questions to connect with the students, encourage exploration to engage them in the learning process. You may allow multiple responses and instead of rejecting any of the responses, ask why, before revealing the suggested answer or hints.
What is a 'Day to day Relevance' (DD) Asset?	The Day to Day Relevance asset helps students understand the practical relevance of every topic, making them eager participants in the classroom. If students connect the concepts to their environment, they would learn meaningfully without dislike or simply memorizing for exams.

How to teach using the DD asset?	You may use the asset by asking questions about their experience and use it to establish why they are learning the topic. If necessary you may substitute with a recent or local example.
What is an 'Interesting Aside' (IA) asset?	The Interesting Aside asset uses attention grabbing titbits or anecdotes to bring joy and satisfy the child's hunger to know more. This is a quick/short asset intended to bring attention back to the main concept being taught.
How to teach using the IA asset?	You may use this asset to give a piece of interesting information relevant to the topic, without prolonged explanation/discussion. You may suggest appropriate books for further reading.
What is a 'Suggested Activity' (SA) Asset?	The Suggested Activity asset provides a detailed step by step procedure for the teacher to conduct a hands-on activity. This promotes Activity Based Learning.
How to teach using the SA asset?	You may use this asset to energise your students to learn by doing simple, fun-filled activities based on the topic. The asset includes - preparation, activity, and follow-up. You may engage the students in the preparation and follow-up stages to develop collaboration and responsibility. You could try it once, yourself, before the actual delivery to be more comfortable with it. Note: The duration mentioned in the asset is usually for the activity part only.
What is a 'Value Content' (VC) Asset?	The Value Content asset integrates Universal Human Values (such as empathy, inclusivity, respect for nature that translates into responsible behaviour) seamlessly into the curriculum, as the "End of education is character".
How to teach using the VC asset?	You may use this asset to engage with the students to bring out their innate values and connect with the intrinsic values in the topic/concept. The asset includes pointers on the specific pedagogical technique followed.
What is a 'Questions to Assess' (QA) asset?	The Questions to Assess asset uses an interactive approach to check learning of different types of learners, and provides feedback to the teacher for appropriate action. The questions cater to all the levels of Bloom's Taxonomy. Questions from 'Apply' level and above enable students to reflect on their learning.
How to teach using the QA asset?	You may go through the slides to understand its flow and know when to click for the answer (slides include suggested answers). While presenting in the class, you may display the question and encourage multiple responses, before revealing the answer. In some cases, this asset may include extra questions/worksheet that can be given as homework.