Collegedunia NCERT Notes

NCERT Notes for Class 8 Science (Curiosity) (2026-27 Syllabus)

Chapter 9: The Amazing World of Solutes, Solvents, and Solutions

These notes explain solutions, solubility, saturated mixtures, density, measuring mass and volume, displacement and floating from the Class 8 Science Curiosity textbook.

Also see for this chapter: NCERT Solutions NCERT Book PDF

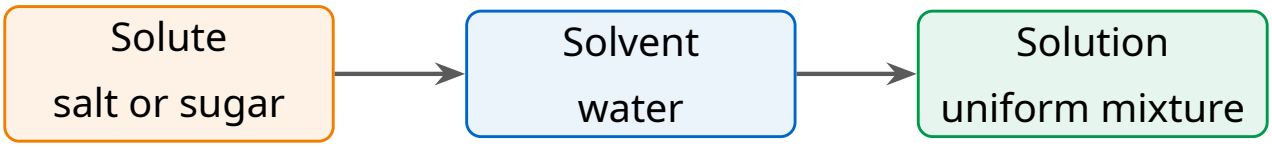
Contents

1 Solutions and Mixtures

This chapter begins with the everyday idea of mixing. Some mixtures become uniform throughout, while others keep visible separate parts.

1.1 Solute solvent and solution

A solution forms when a solute dissolves evenly in a solvent. In salt water, salt is the solute, water is the solvent, and salt water is the solution.

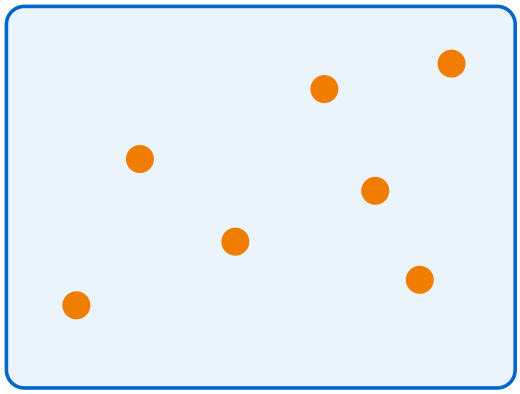


Solution

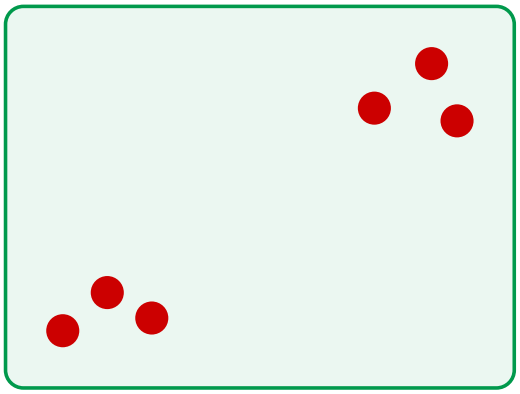
A solution is a uniform mixture. The dissolved substance is the solute and the dissolving medium is the solvent.

1.2 Uniform and non-uniform mixtures

Sugar and salt dissolve in water to form uniform mixtures. Chalk powder, sand and sawdust in water form non-uniform mixtures because their particles remain visible or settle.



uniform solution



non-uniform mixture

Visibility Clue

If components are not visible separately and every sip or spoonful is similar, treat it as a uniform mixture.

1.3 Liquid in liquid solutions

When two liquids form a solution, the component present in smaller amount is usually called the solute. The component present in larger amount is called the solvent.

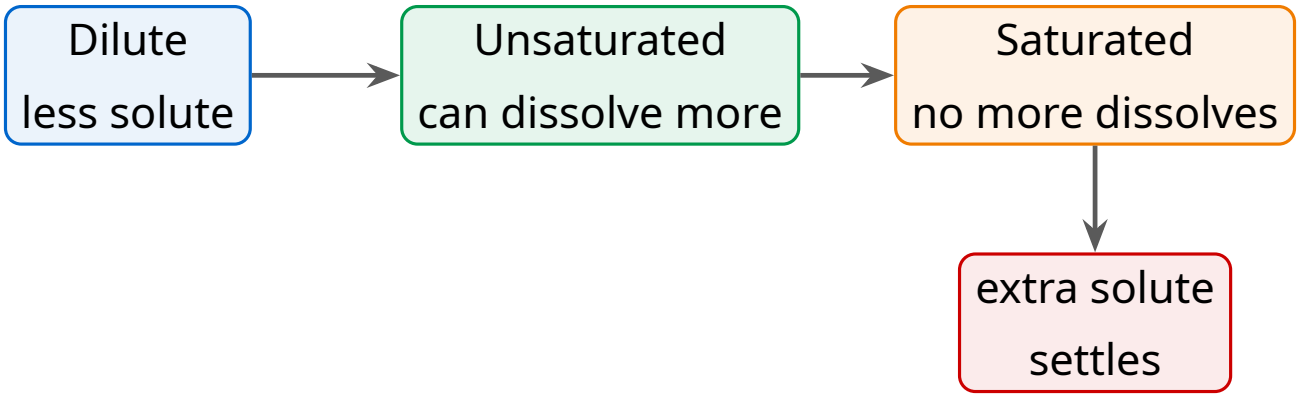
Mixture	Uniform or non-uniform	Reason
Salt and water	Uniform	Salt dissolves evenly
Sugar and water	Uniform	Sugar dissolves evenly
Sand and water	Non-uniform	Sand settles and remains visible
Sawdust and water	Non-uniform	Sawdust floats and remains visible

2 Saturated, Unsaturated and Concentrated Solutions

A fixed amount of solvent cannot dissolve unlimited solute. The limit depends on the solute, solvent and temperature.

2.1 Unsaturated solution

An unsaturated solution can dissolve more solute at a given temperature. One spoon of salt in half a tumbler of water is usually unsaturated.



2.2 Saturated solution

A saturated solution contains the maximum amount of dissolved solute at that temperature. Extra salt remains undissolved at the bottom.

Saturation Trap

A saturated solution is saturated only at that temperature. Heating may allow more solute to dissolve.

2.3 Dilute and concentrated

A dilute solution has less solute in a fixed amount of solution. A concentrated solution has more solute in the same amount of solution.

Concentration

For the same volume of solution, more dissolved solute means a more concentrated solution.

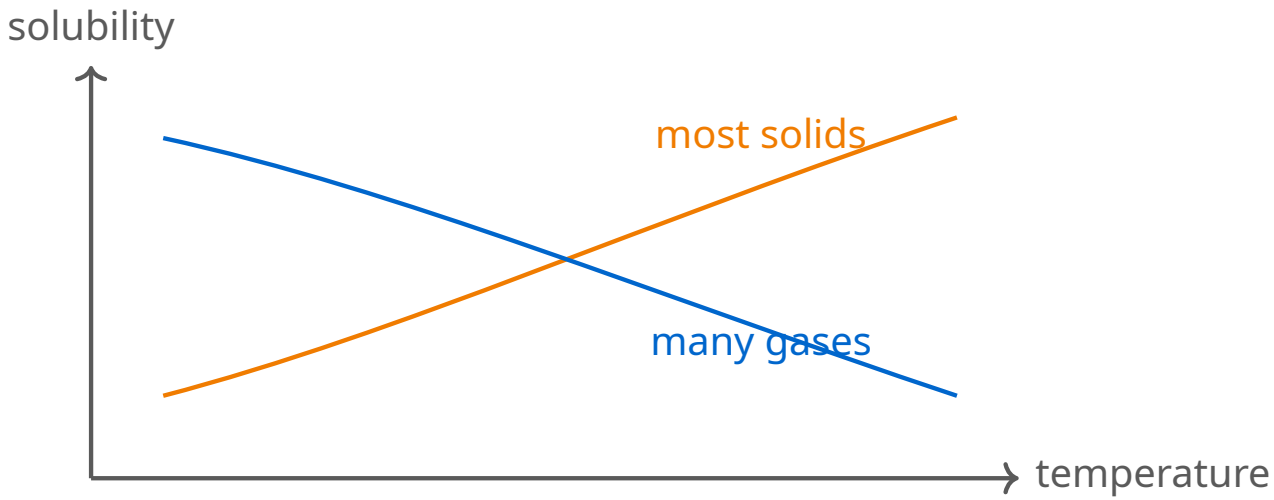
Term	Meaning	Chapter example
Unsaturated solution	Can dissolve more solute at that temperature	Early spoons of salt dissolve
Saturated solution	Cannot dissolve more solute at that temperature	Extra salt settles
Dilute solution	Less solute in fixed amount	One spoon salt in water
Concentrated solution	More solute in fixed amount	Several spoons salt in water

3 Temperature and Solubility

Temperature changes solubility. The chapter shows this through baking soda in water and dissolved oxygen in water.

3.1 Solubility of most solids

For most solids, solubility increases when temperature rises. Baking soda that remains undissolved at a lower temperature can dissolve after heating.



Cooking Link

Sugar syrup for sweets is a concentrated solution. Water is still the solvent even when sugar is present in large amount.

3.2 Solubility of gases

Many gases dissolve less when water becomes warmer. Cold water can hold more dissolved oxygen than warm water, which helps aquatic life.

Cold Water and Fish

Cold water can hold more dissolved oxygen than warm water. This is one reason temperature affects aquatic habitats.

3.3 Water as a solvent

Water is a good solvent for many substances, but not for everything. Salt and sugar dissolve in water, while oil does not dissolve in water.

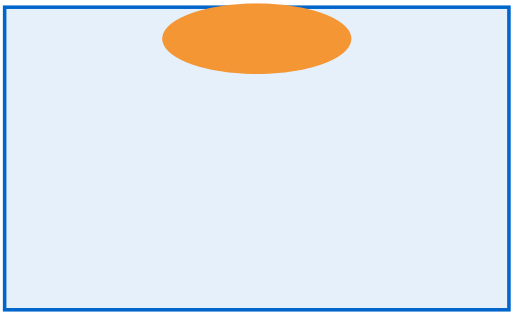
Condition	Solids in liquids	Gases in liquids
Temperature increases	Solubility often increases	Solubility generally decreases
Example	Baking soda dissolves more on heating	Warm water holds less oxygen
Effect	A saturated solution can become unsaturated	Aquatic life may get less dissolved oxygen

4 Floating, Sinking and Density

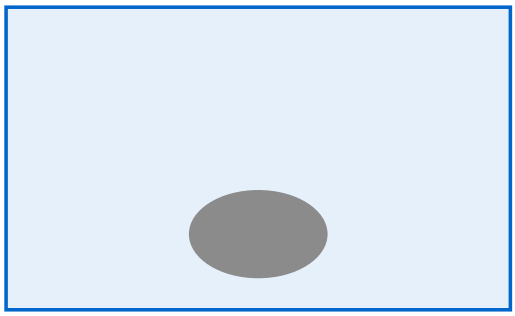
Floating and sinking are linked strongly to density, but shape and trapped air can also matter in real objects.

4.1 Why objects float or sink

Oil floats on water because it is less dense than water. Sand sinks because its density is greater than the effective density of the water it displaces.



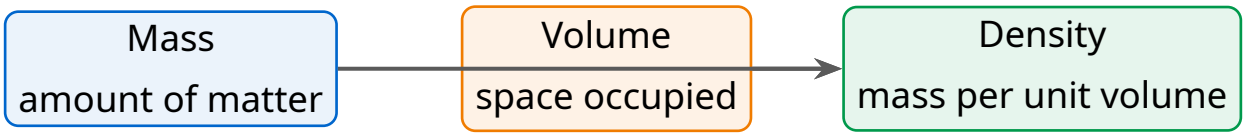
less dense object floats



denser object sinks

4.2 Density formula

Density is mass per unit volume. A substance with more mass packed into the same volume has higher density.



Density

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Use grams and cubic centimetres together, or kilograms and cubic metres together.

4.3 Relative density

Relative density compares the density of a substance with the density of water at the same temperature. It has no unit.

Relative Density

Relative density has no unit because it is one density divided by another density.

Object or substance	Density clue	Likely result in water
Oil	Less dense than water	Floats
Iron rod	Denser than water	Sinks unless shaped to displace enough water
Bamboo raft	Low effective density with trapped air	Floats
Unpeeled orange	Peel traps air and lowers effective density	Floats

5 Measuring Mass Correctly

Density calculations need reliable measurements. The chapter uses a digital balance and explains why tare is useful.

5.1 Mass and weight

Mass is the amount of matter in an object. Weight is the force with which Earth pulls the object. Balances commonly show mass values.

5.2 Using a digital balance

Switch on the balance, place the watch glass or container, press tare, then place the object. The displayed value is the mass of the object alone.

> **Tare Error**
>
> Do not include the mass of the watch glass or beaker. Tare the balance before adding the object or liquid.

5.3 Measuring liquids

A liquid can be weighed by first taring a beaker and then pouring the required amount of liquid into it.

Step	Action	Why
1	Switch on the balance	Starts the reading
2	Place watch glass	Protects the pan
3	Press tare	Removes container mass
4	Place object	Shows object mass only

6 Measuring Volume Correctly

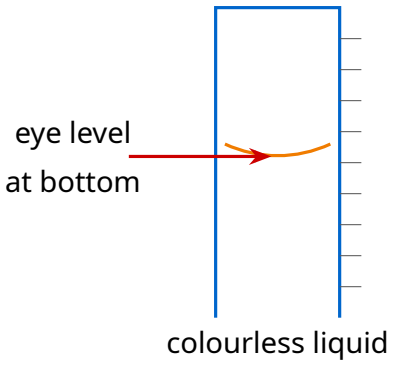
Volume is the space occupied by an object or a substance. Liquids and regular solids are measured in different ways.

6.1 Measuring cylinder choice

A narrow measuring cylinder gives a clearer scale than a wide beaker. The smallest division decides the least volume it can measure.

6.2 Reading the meniscus

For water and other colourless liquids, the reading is taken at the bottom of the meniscus, with eyes at the same level.



Meniscus Rule

For colourless liquids, read the bottom of the meniscus. Keep the eye at the same level.

6.3 Regular solids

For a cuboid, volume equals length multiplied by width multiplied by height. If length, width and height are in centimetres, volume is in cubic centimetres.

Volume case	Method	Unit
Liquid	Measuring cylinder	mL or L

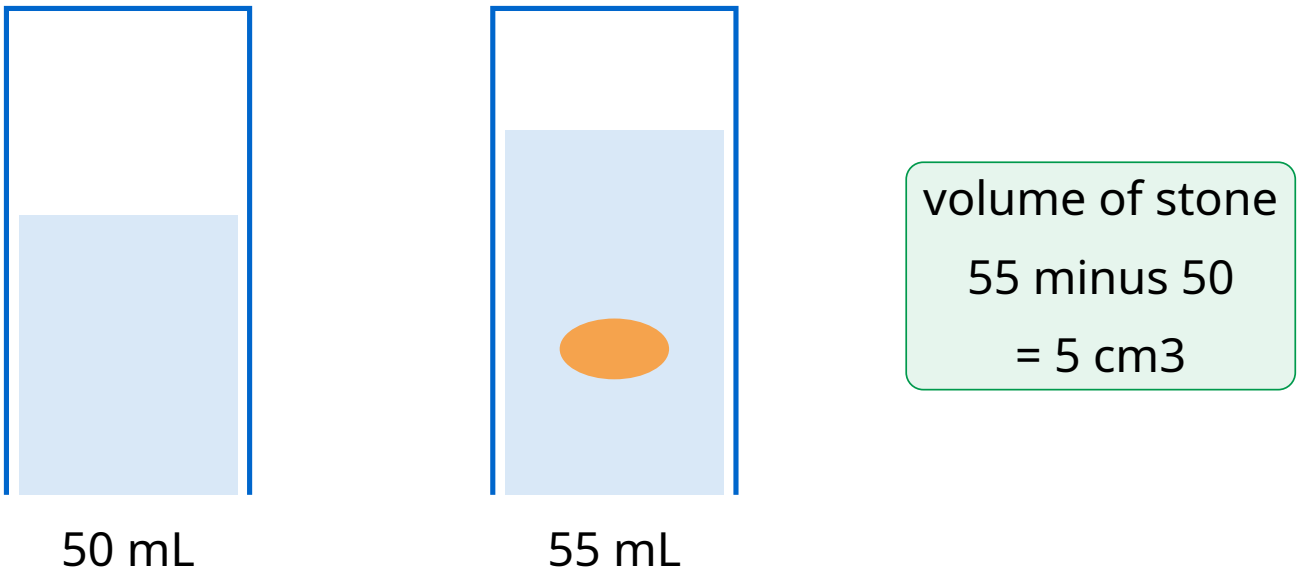
Cuboid	Length times width times height	cm3 if dimensions are in cm
Irregular solid	Water displacement	mL or cm3

7 Displacement Method for Irregular Solids

Irregular objects such as stones do not have simple length, width and height. Their volume can be found by water displacement.

7.1 Initial and final volume

First note the initial water level. Then lower the object into water and note the final water level.



7.2 Volume displaced

The object's volume equals final volume minus initial volume. If water rises from 50 mL to 55 mL, the object's volume is 5 cm3.

Displacement

Volume of object equals final water level minus initial water level.

7.3 Density calculation

If a stone has mass 16.400 g and volume 5 cm3, density equals 16.400 divided by 5, which is 3.28 g/cm3.

Data	Calculation	Result

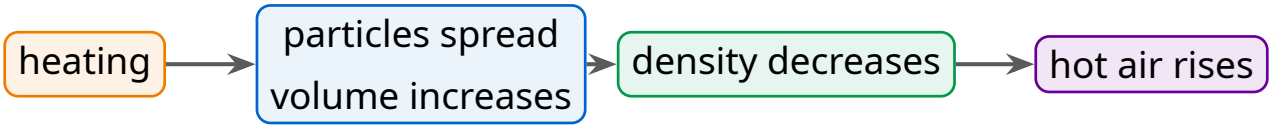
Initial water 50 mL, final water 55 mL	55 minus 50	Volume is 5 cm3
Mass 16.400 g, volume 5 cm3	16.400 divided by 5	Density is 3.28 g/cm3
Mass 225 g, volume 90 cm3	225 divided by 90	Density is 2.5 g/cm3

8 Temperature, Pressure and Density

Density changes when volume changes while mass stays the same. Heating and pressure affect different states of matter differently.

8.1 Heating usually lowers density

On heating, particles usually spread out. Volume increases while mass remains the same, so density decreases.

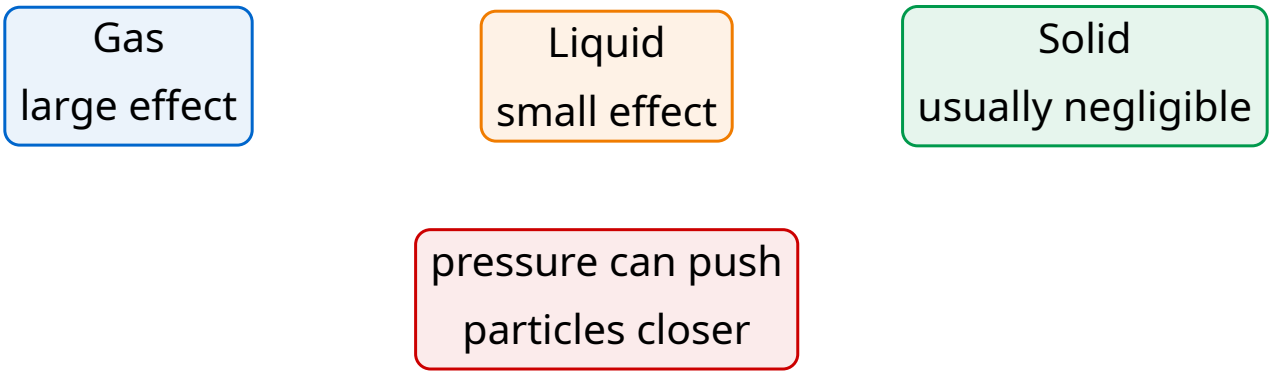


Heat, Spread, Less Dense

On heating, particles usually spread out. Volume increases, so density decreases.

8.2 Pressure on gases

Increasing pressure pushes gas particles closer. The volume of gas decreases and density increases.



8.3 Ice floating on water

Ice floats because it is less dense than liquid water. Water expands on freezing, so the same mass occupies more volume.

Ice Layer

Floating ice can form a layer on lakes. Water below remains liquid enough for many organisms to survive.

State	Effect of pressure	Reason
Gas	Large density change	Particles are far apart and compressible
Liquid	Small density change	Particles are close and nearly incompressible
Solid	Usually negligible change	Particles are very close

9 Applications and Exam Revision

The chapter connects solutions and density to ORS, aquatic life, oil packets, bamboo rafts, hot air balloons and the Dead Sea.

9.1 ORS and uniform taste

ORS tastes the same in each sip because sugar and salt are evenly distributed in water. That makes it a solution.

> **ORS**
>
> Uniform taste means uniform distribution. ORS is a solution of sugar and salt in water.

9.2 Aquatic life

Dissolved oxygen supports fish and aquatic plants. Warmer water holds less oxygen, so temperature matters for water bodies.

9.3 Density in daily life

Oil packets may show one litre but less than one kilogram because oil is less dense than water. Bamboo rafts float because their effective density is low.

Question type	Answer frame	Example finish
Define solution	Uniform mixture plus solute and solvent	Salt water is a solution
Calculate density	Write formula, substitute, unit	400 g divided by 40 cm3 is 10 g/cm3
Explain floating	Compare density with water	Less dense material floats
Read volume	Initial and final water level	Difference gives displaced volume

Related Collegedunia Resources

- Class 8 Science Chapter 9 NCERT Solutions
- Class 8 Science Chapter 9 NCERT Book PDF
- Class 8 Science Chapter 9 Handwritten Notes
- Chapter 6 Notes
- Chapter 7 Notes
- Chapter 8 Notes
- Class 8 Science Curiosity Resource Hub

Unit Mix

Do not mix litres directly with cubic centimetres in one density calculation. Convert units first.

Exam Ending

End every calculation with a unit. End every concept answer with the density or solubility reason.

10 One-Page Formula and Definition Sheet

Use this page for quick revision before attempting the textbook questions.

Term or formula	Meaning	Example
Solute	Substance that dissolves	Salt in salt water
Solvent	Substance in which solute dissolves	Water in salt water
Solution	Uniform mixture	ORS, sugar water
Solubility	Maximum solute dissolved in fixed solvent at a temperature	More baking soda dissolves in hot water
Density = Mass / Volume	Mass per unit volume	225 g / 90 cm3 = 2.5 g/cm3
Relative density	Density compared with water	Aluminium has relative density 2.7

Short Numerical Routine

Write given values, write the formula, substitute values, calculate carefully and add the unit.

11 Common Mistakes and Correct Lines

These are the most common mistakes in this chapter.

Mistake	Correct line	Why
Oxygen is more soluble in hot water	Oxygen is generally more soluble in cold water	Gas solubility decreases on heating
Sand and water is a solution	Sand and water is a non-uniform mixture	Sand does not dissolve
Mass means space occupied	Volume means space occupied	Mass is amount of matter
Saturated solution can dissolve more at same temperature	It cannot dissolve more at that temperature	Extra solute remains undissolved
Density changes when shape changes	Density is independent of shape for the same substance	Mass and volume change together for same material

Dead Sea Link

Very salty water has high density. This makes floating easier, but extreme salt content limits ordinary aquatic life.

12 Practice Answer Frames

Use these frames to write complete answers.

Prompt	Begin with	Then add
Why does oil float on water?	Oil is less dense than water	Less dense liquid stays above denser water
Why does hot air rise?	Heating decreases density	Less dense hot air moves upward
How do you find irregular solid volume?	Use displacement method	Final level minus initial level
Why does an unpeeled orange float?	Peel traps air	Effective density is lower than water
What happens to density on heating?	Volume usually increases	Mass remains same, so density decreases