

**LESSON PLAN [2019 - 2020]**

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
	IX	Chemistry	35 mins Pd 1	April	Matter in our surroundings	Matter and its properties
Expected Learning Outcome: Students will be able to: 1) Define matter and classify matter on the basis of physical nature of matter. 2) Differentiate matter from abstract things. 3) Justify particulate nature of matter. 4) Enlist the properties of matter.						
Expected skill development: • Observation skill • Analytical thinking • Critical thinking and communication						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Discussion on rubrics for notebooks (15 min)

Introduction- Calibration of the previous knowledge will be done through the following questions-

Q1) What is matter?

Q2) Pick out matter from the given set of items-

Chair, hate, table, perfume, regret

Q3 Are mass and weight the same? (5 min)

Activity- Dissolution of sugar into water (Demonstration method)

Burning of incense stick.

Q4) What do you all observe?

Q5) What do you infer?

Q6) Can you see the particles?

Closure –

Teaching Methodology-

- Discussion
- Activity
- Questionnaire

Discussion on characteristics of particles (Derivational approach)

1) Particles of matter are very small.

2) Particles of matter attract each other.

3) Particles of matter have spaces between them. (10 min)

Think line: When 50 g of sugar is dissolved in 100 ml of water, there is no increase in volume.
Which characteristic of matter is illustrated by this observation ?

- Proposed Questions (must include the questions asked in the classroom <u>and</u> the ones given as class-work in the notebook) i. What is matter? ii. Pick out matter from the given set of items- iii. Chair, hate, table, perfume, regret iv. Are mass and weight the same? v. What do you all observe? vi. What do you infer? vii. Can you see the particles?	
- Evaluation/Assessment: ➤ Classroom Discussion ➤ Oral Questionnaire	
Learners on the way Q1 Define matter. Q2 What happens when copper sulphate crystals (blue in colour) are poured into water?	Advanced Learners Q1 Explain in detail how does the intermolecular forces of attraction among the constituent particles and their kinetic energy affect the physical state of matter.
Materials needed/Resources: NCERT Text Book, Notebook, chalk, duster , pencil, eraser.	
Common Misconceptions: Smell of perfume is not matter.	Addressing the misconceptions: Relevant explanation will be given.

Home Assignment: Explore on the fourth and fifth state of matter. (5min)

**LESSON PLAN [2019 - 2020]**

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
	IX	Chemistry	35 Min Pd 2	April	Matter in our surroundings	Matter and its properties

Expected Learning Outcome: Students will be able to:

- 1) Define diffusion.
- 2) State the size of an atom.
- 3) List the reason for the fact that an atom cannot be seen with naked eyes.
- 4) Name the different states of matter of matter.
- 5) Enlist the reasons for the existence of different states of matter.

Expected skill development:

- Observation skill
- Analytical thinking
- Critical thinking and communication

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction- (Activity)- Dissolution of ink/honey in cold and hot water. (5 mins)

Q1 What do you all observe?

Q2 What do you infer from above activity?

Content- (15 mins)

1) Particles of matter have spaces between them.

2) Particles of matter are constantly moving.

3) Rate of inter mixing is directly proportional to the forces of attraction present between the particles of matter and temperature.

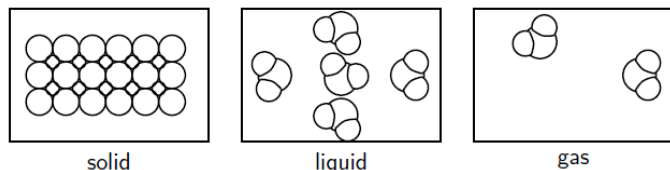
4) Particles of matter attract each other.

Definition of diffusion

Arrangement of particles in all the three states of matter-

Teaching Methodology-

- Discussion
- Activity
- Questionnaire



Discussion on strength of cohesion in solids, liquids and gases

(Closure)- Think line- The boiling point of water is much higher than that of petroleum ether. In which of the two, the inter molecular forces are strong? (Class work) (10 min)

Proposed Questions (must include the questions asked in the classroom <u>and</u> the ones given as class-work in the notebook) Q1- What is matter? Q2- Which would break easily- Chalk or Steel ruler, Why? Q3- Salt on dissolving in water disappears. Is it magic or science? Justify your answer Q4- The boiling point of water is much higher than that of petroleum ether. In which of the two, the inter molecular forces are strong?	
- Evaluation/Assessment: ➤ Classroom Discussion ➤ Oral Questionnaire, ➤ Evaluation on the basis of answers in group discussion	
Learners on the way Q1 When an incense stick is lighted in a corner of a room, its fragrance spreads in the whole room. Which property of matter is demonstrated by this observation?	Advanced Learners Q1 Which characteristic property of particles of matter is shown by the phenomenon of diffusion?
Materials needed/Resources: NCERT Text Book, Notebook, chalk, duster, pencil, eraser, sugar, water, incense stick	
Common Misconceptions: Substances existing in same state might have boiling points closer to each other.	Addressing the misconceptions: Relevant explanation will be given.

Home Assignments:

Q1 Which of the following are matter ? (5mins)

Chair , Air , Love , Smell , Hate , Almonds , Thought , Cold , Lemon water , smell of perfume.

Q2 Give reason for the following observation :

The smell of hot sizzling food reaches you several metres away, but to get the smell of cold food you have to go close.

Q3 A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?

**LESSON PLAN [2019 - 2020]**

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
	IX	Chemistry	35 Min Pd 3	April	Matter in our surroundings	The Solid State
Expected Learning Outcome: Students will be able to: List the properties of solids. Define porous solids Define melting point of solid State the reasons for the existence of solid state Justify why some solids float while others sink in water?						
Expected skill development: • Observation skill • Analytical skill • Critical thinking and communication						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

- The students will be shown the following articles- pen, book, chalk, handbag.
- Sketch the shape of any article in your notebook.

Content-

Q1- Does it has a definite shape, distinct boundary and a fixed volume?[Exp.Ans-Yes]
(5mins)

Q2- What would happen if the article is hammered, pulled or dropped? [Exp.Ans- The shape would remain intact in most of the cases]

Q3- Are they capable of diffusing into each other? [Exp. Ans- No]
(10 min)

Q4- Can you compress them? [Exp .Ans-No]

Q5- (The sponge would then be shown to the students) what about a sponge? It is solid yet we are able to compress it? Why? [Exp .Ans- It has air spaces]

Teaching Methodology-

- Discussion
- Activity

Such substances are called compressible solids

(5 min)

Q6- Salt and sugar when kept in different jars takes the shape of the jar? Is it a solid?

[Exp. Ans- No] Explanation- Yes, as the shape of each individual crystals remain fixed. (10min)

Q7- A rubber band can change its shape? Is it a solid? [Exp. Ans- Yes, as it changes shape under force]

(Closure) Think line- Why do solids generally lack the property of diffusion?

(5 min)

Proposed Questions (must include the questions asked in the classroom <u>and</u> the ones given as class-work in the notebook) Q1- Does it have a definite shape, distinct boundary and a fixed volume? Q2- What would happen if the article is hammered pulled or dropped? Q3- Are they capable of diffusing into each other? Q4- Can you compress them? Q5- (The sponge would then be shown to the students) What about a sponge? It is a solid yet we are able to compress. Why? Q6- Salt and sugar when kept in different jars takes the shape of the jar? Is it a solid? Q7 - A rubber band can change its state? Is it solid?	
- Evaluation/Assessment: ➤ Oral Questionnaire, ➤ Evaluation on the basis of answers in group discussion	
Learners on the way Q1 List any three characteristics of a solid. Q2 In which states of matter the interparticle space is minimum?	Advanced Learners Q1 Why are solids generally heavy while gases are light? Q2 Solids generally have higher density as compared to liquids, but ice floats on water. Justify.
Materials needed/Resources: NCERT Text Book, Notebook, chalk, duster, pencil, eraser, sugar, water, incense stick	
Common Misconceptions: 1) Sugar and salt are not solids 2) A rubber band is not a solid 3) A sponge cannot be regarded as solid.	Addressing the misconceptions: Relevant explanation will be given.

Home Assignment:

Q1- Account for the following-

- a) Wood, stone , book are classified as solids.
- b) Wood floats on water
- c) A coin sinks in water
- d) Cotton initially floats but after sometimes sinks in water .

Q2- Can a solid diffuse into another solid? Justify.

(5 min)



Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
	IX	Chemistry	35 Min Pd 4	April	Matter in our surroundings	The Liquid State

Expected Learning Outcome: Students will be able to:

- List the properties of liquid
- Define boiling point of a liquid
- State the reasons for the existence of liquid state
- Justify why ice floats on water though both of them contains the same molecules ?

Expected skill development:

- Observation skill
- Analytical skill
- Critical thinking and communication

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

Recapitulation of the previous topic will be done through the following questions-

Q1- Enlist any 3 characteristic properties of the pencil placed in your hand.

Q2- How is a sponge different from a wooden duster? (10 min)

Content- Students will be shown different substances like water, cooking oil, cold drink and containers of different shapes.

Q3- What will happen if these liquids are spilt on the floor?

(Exp. Ans- They will float)

Q4- (Any one liquid will be taken and transferred to different containers having different shapes). Does the shape and volume remain the same?

(Exp. Ans- Yes)

Q5- When the liquid was poured from one container to the other, does it flow easily?

(Exp. Ans-yes) (10 min)

(A student will be asked to mix cold drink with water and then state his observation.)

Q6- Compare the intermixing of cold drink with water with that of salt and water.

(Exp. Ans- Liquids diffuse faster as compared to solids)

Explanation of properties of liquid by the mentor

Think Line- A sample of water has a boiling point of 101.5 degree celsius at normal atmospheric pressure . Is water pure?

Closure- Recapitulation of the topic will be done through the following questions-

Q1- List the properties of liquids?

Q2- How is the properties of a liquid different from that of a solid?

Q3- Water at room temperature is a liquid. Justify. (10 min)

Teaching Methodology

- Activity
- Questionnaire
- Discussion

- Proposed Questions (must include the questions asked in the classroom and the ones given as class-work in the notebook)

Q1- Enlist any 3 characteristic properties of the pencil placed in your hand.

Q2- How is a sponge different from a wooden duster?

Q3- What will happen if these liquids are spilt on the floor.

Q4- Do the liquids show change in shape and volume?

Q5- When the liquid was poured from one container to the other, does it flow easily.

- Evaluation/Assessment:

➤ Oral Questionnaire,

Learners on the way

Re-explanation of the content in simpler language.

Q. Compare the intermixing of cold drink with water with that of salt and water

Advanced Learners

A sample of water has a boiling point of 101.5 degree celsius at normal atmospheric pressure. Will this water freeze at zero degrees Celsius?

Materials needed/Resources:

NCERT Text Book, Notebook, chalk, duster, pencil, eraser, water, cooking oil, cold drinks, and containers of different shapes disposable glasses, plastic spoons.

Common Misconceptions:

Student might face difficulty in understanding the terms like fluidity and viscosity.

Addressing the misconceptions:

Example of water and honey will be taken.

Home Assignment:

Q1 Give two reasons to justify –

- i) Water at room temperature is a liquid.
- ii) An iron almirah is a solid at room temperature.

Q2 What is the physical state of water at zero degree Celsius? (5min)



LESSON PLAN [2019 - 2020]

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
	IX	Chemistry	35 Min Pd 5	April	Matter in our surroundings	The Gaseous State
Expected Learning Outcome: Students will be able to: List the properties of gases State the reasons for the existence of gaseous state Differentiate between three states of matter.						
Expected skill development: • Observation skill • Analytical skill • Critical thinking and communication						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction-

Q1-(An empty closed container will be shown to the students) Is this container empty? [Exp Ans-yes]

(the lid of the container will be removed and it will be perpendicularly pressed against the surface of the water)

Q2-Why is the water not entering through the mouth of the jar.[Exp. Ans- As it contains air]
(10 min)

Q3- Reflect on the 2 cases and then tell that was the empty container actually empty. [Exp. Ans- No it had air]

Content- Discussion on gaseous state

Syringe activity will be shown to show that the gases are more compressible. (10 min)

Q4- Link this observation with an application in your daily life.[Exp. Ans- CNG used in vehicles/LPG used as cooking gas]

Think Line-

Q5- Can a gas cylinder be half filled? Comment on the validity of the statement

Discussion on characteristic properties of gases

- No fixed shape
- No fixed volume
- Highly compressible
- Weak inter molecular forces of attraction
- Large inter molecular spaces

Teaching Methodology

- Activity
- Questionnaire
- Discussion

Closure- Recapitulation of the topic will be done through the following questions-

Q1- List the properties of gases

Q2. Gases can be easily compressed unlike solids. Why?

- Proposed Questions (must include the questions asked in the classroom and the ones given as class-work in the notebook)

Q1-(An empty closed container will be shown to the students) Is this container empty?

(the lid of the container will be removed and it will be perpendicularly pressed against the surface of the water)

Q2-Why is the water not entering through the mouth of the jar?

Q3- Reflect on the 2 cases and then tell that was the empty container actually empty.

Q4- Link this observation with an application in your daily life.

- Evaluation/Assessment:

- Oral Questionnaire,
- Written assignment.

Learners on the way
Re-explanation of the content in simpler language.
Q. Do gases have a fixed shape?

Advanced Learners
Q. Can solids be compressed easily? Comment.

Materials needed/Resources:

NCERT Text Book, Notebook, chalk, duster, pencil, eraser, empty container, 3 syringes, chalk powder, water.

Common Misconceptions:

Addressing the misconceptions:

Difference between gas and vapour	Relevant explanation will be given with demonstration
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Q2- Why do gases diffuse at faster rate?

(10 min)

Home Assignments:

Q1 Give reasons :

- a) A gas fills completely the vessel in which it is kept.
- b) A gas exerts pressure on the walls of the container.
- c) A wooden table should be called as solid.
- d) We can easily move our hands in air but to do the same through a solid block of wood we need a karate expert.

Q2 Tabulate the differences between the characteristics of three states of matter (5min)

**LESSON PLAN [2019 - 2020]**

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
	IX	Chemistry	35 Min Pd 6	April	Matter in our surroundings	Inter conversion of states of matter
Expected Learning Outcome: Students will be able to: 1) Differentiate between 3 states of matter 2) List the factors responsible for causing the change in state 3) Define the terms like- fusion, vaporization, condensation, solidification, sublimation, evaporation.						
Expected skill development: • Observation skill • Analytical skill • Critical thinking and communication						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction- Activity- The teacher will show melting point of ice cubes in a beaker.

The following questions will be asked from the students-

Q1-What do you all observe?

Q2- What is causing the change in state?

Q3- What is the direction of flow of heat?

Q4- How did the alignment of the molecules change in both the states? (5 min)

Explanation by mentor

Solid-melting/fusion→Liquid

Q5- Define melting

Liquid vaporisation→ Gas

Differentiate between evaporation and vaporization (10 min)

Q6- Define vaporization.

Liquid Freezing/ solidification→ Solid

Teaching Methodology

- Activity
- Discussion

Q7- Define freezing

Gas condensation → Liquid

Q8-Define Condensation

Solid Sublimation → Gas

(10 min)

Q9- Define sublimation eg. Dry ice

Explanation by Mentor

Closure- (Think Line)

Ice- cream vendors use dry ice to keep their stock at the right temperature, still we do not see even a single drop of water around. Explain.

(5 min)

- Proposed Questions (must include the questions asked in the classroom and the ones given as class-work in the notebook)

Q1-What do you all observe?

Q2-What is causing the change in state?

Q3-What is the direction of flow of heat?

Q4-How did the alignment of the molecules change in both the states ?

Q5-Define melting.

Q6-Differentiate between evaporation and vaporization

Q7-Define vaporization.

Q8-Define freezing.

Q9-Define Condensation.

Q10-Define sublimation.

- Evaluation/Assessment:
 - Classroom Discussion
 - Oral Questionnaire,

Learners on the way
Re-explanation of the content in simpler language.
Q Differentiate between condensation and

Advanced Learners
Q. Why do we see water droplets on the outer surface of the glass having ice cold water.

sublimation.	
Materials needed/Resources: NCERT Text Book, Notebook, chalk, duster, pencil, eraser, ice.	
Common Misconceptions: Formation of a liquid from vapors involves cooling. Dry ice is a form of ice. Fusion means mixing of liquids.	Addressing the misconceptions: Relevant explanation will be given with e.g and demonstration

Home Assignment:

Q1 Suggest a method to liquefy atmospheric gases.

Q2 Give reason for the following observation:

a) Naphthalene balls disappear with time without leaving any solid.

b) We can get the smell of perfume from a distance



LESSON PLAN [2019 - 2020]

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
DLF Public School	IX	Chemistry	35 Min Pd 7	April	Matter in our surroundings	Inter conversion of states of matter
Expected Learning Outcome: Students will be able to: 4) Convert Temperature from $^{\circ}\text{C}$ to K 5) Convert Temperature from K to $^{\circ}\text{C}$ 6) Define latent heat, latent heat of fusion and vaporization.						
Expected skill development: • Observation skill • Analytical skill • Critical thinking and communication						

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Introduction- Activity- Recapitulation of the previous topic through the following questions-

Q1- Define condensation?

Q2- What would be the state of water at 250°C ?

Q3- Name the substances which undergo sublimation?

Q4- What is the melting point and boiling point of water? (10 min)

Content- Q5- State the temperature in Kelvin

$$\text{TK} = \text{T}^{\circ}\text{C} + 273$$

a) 543°C (b) 600°C (c) 273°C (d) 800°C

Q6- Convert the given temperatures into Celsius scale

$$\text{T}^{\circ}\text{C} = \text{TK} - 273$$

a) 300K (b) 573K (c) 100K (d) 700K (15 min)

Discussion on

a) Rise in temperature when ice melts

Teaching Methodology

- Activity
- Questionnaire
- Discussion

- b) Rise in temperature when the water boils
Introduction of the term latent heat, Latent heat of fusion and vaporization.

Closure

Proposed Questions (must include the questions asked in the classroom <u>and</u> the ones given as class-work in the notebook) Q1-Define condensation? Q2- What would be the state of water at 250⁰ C? Q3- Name the substances which undergo sublimation? Q4- What is the melting point and boiling point of water? Q5- State the temperature in Kelvin $TK = T^{\circ}C + 273$ a) 543⁰ C (b) 600⁰ C (c) 273⁰C (d) 800⁰C Q6- Convert the given temperatures into Celsius scale $T^{\circ}C = TK - 273$ a) 300K (b) 573K (c) 100K (d) 700K	
- Evaluation/Assessment: ➤Oral Questionnaire, ➤Numerical on conversion to be solved.(Written)	
Learners on the way Re-explanation of the content in simpler language.	Advanced Learners HOTS questions as per their learning progression will be asked.
Materials needed/Resources: NCERT Text Book, Notebook, chalk, duster, pencil, eraser, ice.	
Common Misconceptions: Temperature value cannot be negative	Addressing the misconceptions: Relevant explanation will be given

Think Line- What produces more severe burns boiling water or steam? (5 min)

Home Assignment:

Q1- Why is ice at 273K more effective in cooling than water at the same temperature?

Q2 Convert the following temperatures to the celsius scale :

a) 293 K b) 470 K

Q3 Convert the following temperatures to the kelvin scale.

a) 25° C b) 373° C

(5min)

**LESSON PLAN [2019 - 2020]**

Teacher Name	Class	Subject	Time slot	Date	Lesson	Topic
DLF Public School	IX	Chemistry	35 Mins Pd 8	May	Matter in our surroundings	Evaporation causes cooling
Expected Learning Outcome: Students will be able to: 7) Define evaporation. 8) List and explain examples where evaporation causes cooling. 9) List the factors effecting evaporation.						

Expected skill development:

- Observation skill
- Analytical skill
- Critical thinking and communication

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line)

Introduction-Recapitulation of the previous topic through the following questions-

Q1- How does a solid change into liquid on heating?

Q2- Define evaporation

Q3- Is evaporation an exothermic / endothermic process?

Content-

- 1) Evaporation is an endothermic process
- 2) The heat may be provided by the liquid itself or by the surroundings.
- 3) Evaporation causes cooling- this concept will be made clear through the following questions-

Q4- Why do we feel relief under a fan when perspire?

Q5- Why does water gets cool in an earthen pot?

Q6- Why should we wear cotton clothes during summers?

Q7- Why do wet clothes dry quicker in the sun than in the shade?
(10 min)

Teaching Methodology

- Questionnaire
- Discussion

Discussion on factors affecting the rate of evaporation

- a) Temperature
- b) Surface area
- c) Humidity
- d) Wind speed
- e) Nature of liquid

(10 mins)

(Closure) Think Line- How does the air passing through a room cooler becomes cool?

Proposed Questions (must include the questions asked in the classroom <u>and</u> the ones given as class-work in the notebook) Q1- How does a solid change into liquid on heating? Q2- Define evaporation? Q3- Is evaporation and exothermic / endothermic process? Q4- Why do we feel relief under a fan when perspire? Q5- Why does water gets cool in an earthen pot? Q6- Why should we wear cotton clothes during summers? Q7- Why do wet clothes dry quicker in the sun than in the shade? Think Line- How does the air passing through a room cooler becomes cool?	
- Evaluation/Assessment: ➤ Classroom Discussion ➤ Oral Questionnaire,	
Learners on the way Q How can evaporation of a liquid be made faster? Q Evaporation is a surface phenomenon. Justify..	Advanced Learners Q You want to wear your favourite shirt to a party, but the problem is that it is still wet after a wash. What steps would you take to dry it faster?
Materials needed/Resources: NCERT Text Book, Notebook, chalk, duster, pencil, eraser.	
Common Misconceptions: 1) Evaporation is an exothermic process. 2) Increase in humidity increases the rate of evaporation	Addressing the misconceptions: Relevant explanation will be given

(10 min)

Home Assignment:

Q1 Why does a desert cooler cool better on a hot dry day?

Q2 How does the water kept in an earthen pot become cool during summer?

Q3 Why does our palm feel cold when we put some acetone or petrol or perfume on it?

Q4 Why is we able to sip hot tea or milk faster from a saucer rather than a cup?

Q5 Which type of clothes should we wear in a summer? Why? (5min)