

Class 7	Subject: Science	Topic: Physical and Chemical Changes
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SUMMARY SHEET		
Learner Previous Knowledge	Changes occur around us constantly.	
Target Knowledge for this Topic	Physical change- meaning, definition and examples Chemical change- meaning, definition and examples	
Learning Goals		
More Complex Learning Goal- Students will be able to predict the type of change in given situation.		
Target Learning Goal-Students will be able to describe physical and chemical change and also identify the type of change from given examples.		
Simpler Learning Goal- Students will be able to define physical and chemical change and list examples of physical and chemical change.		
Per iod No.	Lesson Objectives	Teaching Learning Materials Required
1	Explain physical change and demonstrate it with activities.	- Boards and markers - Worksheet 1 - Activities -Two identical pieces of paper, two chalk pieces, a mug of steaming water with a plate to cover it.
2	- Analyse chemical change and define it - Give more examples of the chemical change - Identify the characteristics of the chemical change	- Worksheet 2 - For teacher’s demonstration: magnesium ribbon, burner, water, test tube, red and blue litmus

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



3	• Explain how rusting of iron takes place • Explain the ways to reduce corrosion • Explain the process of galvanization.	• Board and markers • Worksheet 3
4	• Show and explain the process of crystallization as physical change.	• Board and markers • Worksheet 4 • Activity - Water, beaker, copper sulphate crystals, pencil, string, burner <i>Note to the teacher: The observation of the activity may take some time. The students may do the activity and then note the observations and the questions in the next class.</i>

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Lesson Plan 1

Lesson Objectives

At the end of this lesson students will be able to:

- Explain physical change and demonstrate it with activities.

Teaching Learning Materials required

- Boards and markers
- Worksheet 1
- Activities -Two identical pieces of paper, two chalk pieces, a mug of steaming water with a plate to cover it.

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 or 5

Lesson Beginning <u>Time:</u> 5 min <u>Purpose:</u> • Activate prior knowledge	• Introduce the topic by asking the following questions: Q1. What happens when we keep ice outside? Q2. Is any new product is formed in the above change? Q3. Is this a reversible or irreversible change? Q4. Give four examples of irreversible change. • Collate all the answers on the board for their reference. • Inform the students that now they will do some activities and learn about physical change.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> • Develop conceptual understanding	<u>Activities</u> • Distribute worksheet to all the students. • Ask the students to do the activities as per instructions in Part A. • The students must individually do the activities but they can discuss the observations and questions based on activities themselves. • Ask the students to observe the plate that is used to cover the steaming hot water and include the observation, while writing the answers. • Now each student should individually answer questions given in part B. • Ask them to tally their answers in groups. • Let there be a whole class discussion and all the answers can be discussed together.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



	Ensure that the whole class is on the same page.
Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Recap students' learning	Finish Up Wrap up the class by clearing the doubts.

Worksheet 1

Skill - Observation and Comprehension

Part A

Do the following activities individually. Compare your observations with your group members.

Activity 1

Take two identical pieces of paper. Tear one into piece. Compare the pieces with the other paper that you have.

Is there a change in the paper that you have torn? _____

What change do you observe? Has a new substance formed? _____

Activity 2

Take two same size pieces of chalk. Crush one chalk into dust. Now compare it with the whole piece.

Is there a change in the chalk that you have crushed? _____

What change do you observe? Has a new substance formed? _____

Part B

I. Fill in the blanks selecting appropriate option.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



In all the above changes, you observed that the substance that undergoes change, only changes its _____ or _____. No new _____ is formed. In this change, a substance may change its _____, as seen in the example of steam converting into water droplets.

II. The change that you saw in the activities is called 'physical' change.

Now, define physical change in your own words.

III. Based on your observations of activities, write two characteristics of physical change.

I. Given below are some examples. Tick the ones which demonstrate physical changes.

- Dew drops condensing on a leaf at dawn. ()
- Two children fighting on the playground. ()
- A piece of rock heating up in the Sun. ()
- Stone dropping from a height. ()
- Spilling of water on the floor. ()
- Copper metal being drawn into wires. ()
- Blowing up a balloon. ()
- Shaping clay into different shapes. ()

II. Give 3 examples of physical change, which you observe at home.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Period 2

Lesson Objectives

At the end of this lesson students will be able to:

- Analyse chemical change and define it
- Give more examples of the chemical change
- Identify the characteristics of the chemical change

Teaching Learning Materials required

- Worksheet 2
- For teacher's demonstration: magnesium ribbon, burner, water, test tube, red and blue litmus

Details of Teaching Learning Experience

Seating Arrangement: In groups of 4-5 each

Lesson Beginning <u>Time:</u> 5min <u>Purpose:</u> • Activate prior knowledge	• Ask the students to share the example of changes where new substance is formed. • Now pose the question: 'What kind of a change is it when, a new substance is formed?' Inform the students that they will find out the answer to this with a demonstration.
Lesson Middle <u>Time:</u> 25min. <u>Purpose:</u> • Develop conceptual understanding	• Ask the students what happens when we tear a paper and when we burn a paper? ○ In which type of condition does new substance form? ○ What is the key difference in between the two changes? • Collate the responses and arrive at a consensus. • Distribute worksheet 2 to all students. • Demonstrate chemical reaction by burning a small piece of magnesium ribbon. • Collect the ash and dissolve it in water. • Let each student test the solution with blue and red litmus paper. • Each group must fill in the observation table.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



	• The students must now attempt the questions based on activities together. • Let there be a whole class discussion now. The students may discuss all the answers of the questions based on the activities. • Arrive at a common consensus. • Discuss the various characteristics of the chemical change with examples of each.
Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish Up	<u>Finish Up</u> • Wrap up the discussion by clearing doubts if the students have.

Worksheet 2

Skill: Observation and Investigation

Demonstration of Chemical Change [to be done by the teacher]

Material: Magnesium ribbon, Bunsen burner, test tube, litmus paper red and blue (for each group)

1. Take a small piece of magnesium ribbon.
2. Using tongs, hold it against flame of a Bunsen burner.
3. Collect the ash formed, in a test tube.
4. Add water to it.
5. Let each group test the resultant solution with red and blue litmus paper.

Observation questions

1. What happened when the magnesium ribbon was held against the flame? Did a new substance form?

2. Does the ash look like magnesium ribbon now? Can you change it back to magnesium ribbon?

Has a new substance formed? _____

4. What was the change in colour of litmus paper when you tested the solution of Magnesium Oxide? Red to blue or blue to red?

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Now answer these questions independently:

1. What type of change have you observed, physical or chemical? Give reason for your answer.

2. Which new substance has formed? _____

3. Based on your litmus test, how can you classify the new substance, acidic or basic? _____

4. Magnesium burns in air and combines with the oxygen. The change can be shown as follows:

Magnesium + Oxygen (since it burns in air) $\longrightarrow$ Magnesium Oxide

Based on the above equation, write the name of the substance before the change and after the change.

Define chemical change in your own words and give an example.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Period 3

Lesson Objectives

At the end of this lesson students will be able to:

- Explain how rusting of iron takes place
- Explain the ways to reduce corrosion
- Explain the process of galvanization.

Teaching Learning Materials required

- Board and markers
- Worksheet 3

Details of Teaching Learning Experience

Seating Arrangement: - In group of 4 to 5

Lesson Beginning <u>Time:</u> 5 min <u>Purpose:</u> Activate prior knowledge	• Ask the students to define chemical change. • Ask them to give three examples of chemical change from their daily life. • Collate the examples on the board. • Ask them the following questions: Q1. What happens when a piece of iron is left out in the open? Q2. Why do we need to paint the iron articles? • Collate the answers on the board.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> • Develop conceptual understanding	• Distribute worksheet 3 to the students. • Ask them to read the questions and discuss the answers in their groups. • Let there be a whole class discussion now. • Ask them to share their personal experiences also, regarding the same. • Make sure to discuss right answers with the class.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Finish Up	<u>Finish Up</u> Wrap up the class by answering doubts if the students have.
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Worksheet 3

Skill: Drawing Inferences

- How does rusting occur?

- What are the conditions necessary for rusting?

- Why is rusting higher in areas with high humidity?

- Define rusting.

- Is rusting a favorable phenomenon or unfavorable one according to you? Why?

Part- 2

- List 3 ways to prevent rusting.

- What can be used to coat iron?

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



3. What is tin plating?

4. What is galvanized iron?

5. What is electroplating?

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Period 4

Lesson Objectives

At the end of this lesson students will be able to:

- Show and explain the process of crystallization as physical change.

Teaching Learning Materials required

Note to the teacher: The observation of the activity may take some time. The students may do the activity and then note the observations and the questions in the next class.

- Board and markers
- Worksheet 4
- Activity - Water, beaker, copper sulphate crystals, pencil, string, burner

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 or 5

Lesson Beginning <u>Time:</u> 5 min <u>Purpose:</u> Activate prior knowledge	Ask questions such as: ○ How is the salt obtained? ○ Why we have salt/sugar in crystal forms? ○ How is it helpful? • Collect response from the students. They must be in consensus with the answers. Inform the students that they will now do an activity.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> • Develop conceptual understanding	<u>Activity</u> • Distribute worksheet 4 to all the groups. • Assign the items needed to do the activity. • They must follow the instructions in the worksheet. • Instruct the students to write their observation and attempt the questions. • After the students have attempted the activity, let there be a discussion on the answers within the groups. Let the groups discuss arrive at a common consensus.

Class 7	Subject: Science	Topic: Physical and Chemical Changes
----------------	-------------------------	---



Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Finish Up	<u>Finish Up</u> Wrap up the class by clearing doubts.
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Worksheet 4

Skill: Observation and Investigation

Activity

Material: water, beaker, copper sulphate crystals, pencil, string, burner

Procedure

1. Take a beaker and half fill it with water.
2. Put it for heating on the burner.
3. Add copper sulphate crystals to it. Keep on adding crystals and dissolving it.
4. Continue till no more crystals can be added to the hot solution.
5. Now, take off the beaker from the heat.
6. Take a pencil and tie a thread to its centre such that the other end hangs.
7. Put the pencil on the rim of the beaker with the thread dipping in the solution.
8. Allow the solution to cool and let it remain undisturbed.

Observation questions

1. What happened when the solution cooled down and was left undisturbed?

2. Why did crystals cling to the thread?

Answer these questions:

1. What is crystallization?

2. Do you think this is a physical change or a chemical change? Give reason for your answer.
