Plan of Work

**Chemistry**

**Grade 9**

For examination from 2025

**HoD:** Mr Foolessur

**Prepared by:** DEPT OF CHEMISTRY

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## Introduction

**Prescribed textbooks:**

* Science for Grade 9 (MIE)

**Recommended prior knowledge**

Learners beginning this course are expected to have knowledge of the following topics:

|  |  |
| --- | --- |
|  | **Topic** |
|  | Composition of air |
|  | Some air pollutants |

**Websites and videos**

This plan of work includes website links providing direct access to internet resources. Modern College is not responsible for the accuracy or content of information contained in these sites. The inclusion of a link to an external website should not be understood to be an endorsement of that website or the site's owners (or their products/services).

The website pages referenced in this plan of work were selected when the plan of work was produced. Other aspects of the sites were not checked and only the particular resources are recommended.

# FIRST TERM [10/01/2025 – 11/04/2025]

## Topic: 1 Atmosphere and environment

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| --- | --- | --- | --- | --- |
| **Learning Objectives** | **Worked Examples** | **Classwork & Homework** | **Extra Work** | **Resources** |
| ***Students should be able to:***  a) Recall the composition of air in the Earth’s  atmosphere |  |  |  |  |
| b) Explain photosynthesis as a process of  transforming light energy into chemical energy |  | Pg 307 No.1,2,3 | . |  |
| c) Describe respiration as the process of breaking  down food in the presence of oxygen to  form carbon dioxide and water to release energy | Pg 308 Test Yourself 1.1 |  |  | https://youtu.be/c4CsaD2V-IY |
| d) Describe combustion as the process of burning  fuel in oxygen | Pg 308 Test Yourself 1.2 |  |  |  |
| e) Explain the different steps in the carbon cycle |  | Pg310 No. 1 – 6 |  | https://youtu.be/fcna9slTljs |
| f) Discuss the importance of photosynthesis and  respiration in maintaining the  composition of air |  |  |  |  |
| g) Define the term greenhouse gas and identify carbon dioxide and methane as greenhouse  gases |  | Pg 312 no.1,2 ,3 |  |  |
| h) Identify greenhouse gases as gases which retain  heat energy in the atmosphere |  |  |  |  |
| i) Recognise that increase in the absorption of heat  energy by the atmosphere is responsible for global  warming |  |  |  | https://youtu.be/7re9dOMXi2c |
| j) Use data to correlate the increase in global  temperatures to an increased amount of  carbon dioxide in the atmosphere | Pg 314 activity 1.4 |  |  |  |
| k) Identify the causes of global warming | Pg 315 activity 1.5 | Pg 316 no 2 – 5 |  |  |
| l) Explain the effects of global warming | Pg 317 activity 1.6 |  |  |
| m) Relate global warming to climate change |  |  |  |  |
| n) Discuss measures to combat climate change |  | Pg 320 activity 1.7 |  |  |
| 0) Identify carbon monoxide, oxides of nitrogen,  sulfur dioxide, CFCs and smoke as air pollutants | Pg 323 activity 1.8,1.9  Pg 325 activity 1.10,1.11- 1.14  Test yourself 1.3  Test yourself 1.4 | |  | https://youtu.be/lR2ivRfD66g |
| p) State the sources and effects of some air  pollutants |  |  |
| q) Explain the causes and effects of acid rain |  |  |
| r) Discuss measures to prevent air pollution |  |  |
| s) Explain the causes and effects of water pollution | Activity 1.16 |  |  |  |
| t) Show understanding of eutrophication and its  harmful effects | Pg 342 no.1 -6 |  |  | https://youtu.be/92TFJTtuq6k |
| u) Discuss measures to prevent water pollution |  | Pg 350 – 354 |  |  |

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## First term examinations

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| **Component** | **Time Allocation** | **Type** | **Marks** | **weightage** |
| single paper | 45 mins | MCQ + Structured Questions | 50 | Combined with marks scored in biology/physics and scaled to 100% |

Single paper **(1hr)** with 10 mcq’s worth 10 marks + variable numbers of structured questions worth 40 marks. Students may be asked to describe simple experiments and draw diagrams to test a given scientific concept in the structured questions

# SECOND TERM [28/04/2025 – 18/07/2025]

## Topic: Language of Chemistry

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Learning Objectives** | **Worked Examples** | **Classwork & Homework** | **Extra Work** | **Resources** |
| **a)** Recall symbols and valencies of some elements | Pg 395 No.1 ,2 ,3 |  |  |  |
| **b)** Recall formulae and valencies of the following  radicals: hydroxide, carbonate, sulfate,  ammonium and nitrate | Test yourself 3.2 | Pg 398 no. 1,2 |  |  |
| **c)** Work out the formulae of compounds | Pg 401 no.1 ,2 |  |  |  |
| **d)** Identify reactants and products in chemical  reactions | Pg 402,403 |  |  |  |
| **e)** Recognise that chemical reactions involve rearrangement of atoms | Pg 407 activity 3.1 | Pg 407 activity 3.2 |  |  |
| f) Convert word equations to chemical equations |  | Pg 413 – 417 |  |  |
| g) Write balanced chemical equations |  | Pg 420 - 423 |  |  |

## Topic: Metals and reactivity series

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Learning Objectives** | **Worked Examples** | **Classwork & Homework** | **Extra Work** | **Resources** |
| ***Students should be able to:***  a) Compare and describe the reaction of copper, iron  and magnesium with oxygen in air | Pg 428 - 430 |  |  | **https://youtu.be/9xaFPO4qnPA** |
| b) Compare and describe the reaction of calcium,  copper, magnesium and sodium with water |  | Pg 431 - 434 | . | https://youtu.be/dmcfsEEogxs |
| c) Compare and describe the reaction of copper and  magnesium with steam |  | Pg 435 activity 4.3 |  |  |
| d) Compare and describe the reaction of copper, iron,  magnesium and zinc with dilute hydrochloric acid |  | Pg 437- 439 |  |  |
| e) Identify the product(s) formed during these  reactions |  |  |  |  |
| f) Write balanced chemical equation for these  reactions |  |  |  |  |
| g) Infer through experiments that different metals  differ in their reactivity |  |  |  |  |
| h) Demonstrate understanding of the reactivity series  of metals |  | Pg 440 |  |  |
| i) Use the reactivity series of metals to investigate  and explain the reactions of metals with  air, water and dilute acids |  | Pg 441,444 |  |  |
| j) Use the reactivity series of metals to investigate  and explain the displacement reactions | Pg 446,447 |  |  |  |
| k) Use the reactivity series of metals to predict the  products of displacement reactions | Pg 449 | Pg 453 – 458 |  | https://youtu.be/21GUv5agL3Y |

**Second Term Examinations**

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| --- | --- | --- | --- | --- |
| **Component** | **Time Allocation** | **Type** | **Marks** | **weightage** |
| single paper | 45mins | MCQ + Structured questions | 50 | Combined with marks scored in biology/physics and scaled to 100% |

Single paper **(45mins)** with 10 mcq’s worth 10 marks + variable numbers of structured questions worth 40 marks. Students may be asked to describe simple experiments and draw diagrams to test a given scientific concept in the structured questions

# THIRD TERM [11/08/2025– 31/10/2025]

## Topic: Mixtures and separation techniques

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Learning Objectives** | **Worked Examples** | **Classwork & Homework** | **Extra Work** | **Resources** |
| **a)** Identify mixtures and list the components present in some mixtures | Pg 356 |  |  |  |
| **b)** Investigate how mixtures can be separated into their respective components by the following techniques: filtration, sublimation, crystallisation, simple distillation and paper chromatography | Pg 358, 359,360 | Pg 362, 363, 364 , 365 |  | https://youtu.be/1LdYvgy94fg |
| **c)** Show and explain how these separation techniques  are carried out | Pg 367,368 ,369 | Pg 371 , 372 |  |  |
| **d)** Explain the principles involved in the separation  techniques covered | Pg 374 , 375 , 376 | Pg 377 , 378 ,379 ,380  Pg 383 - 391 |  |  |

## Topic: Salts

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| **Learning Objectives** | **Worked Examples** | **Classwork & Homework** | **Extra Work** | **Resources** |
| **a)** Recall acids and bases | Pg 460 no.1 , 2 |  |  |  |
| **b)** Recall indicators and pH scale | Pg 462 test yourself 5.2 |  |  |  |
| **c)** Predict the salts that would be obtained from  different acids |  | Pg 465 activity 5.2 |  |  |
| **d)** Define neutralisation reaction |  | Pg 463 activity 5.1 |  |  |
| **e)** Apply the importance of neutralisation in cases  of indigestion and insect stings, in agriculture  and in the prevention of acid rain |  | Pg 466 - 469 |  |  |
| **f)** Identify soluble and insoluble salts | Pg 471 activity 5.4 |  |  |  |
| **g)** State the applications of salts in everyday life | Pg 473 test yourself 5.4 | Pg 476 - 480 |  |  |

**Mock Examinations**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Time Allocation** | **Type** | **Marks** | **weightage** |
| single paper | 45mins | MCQ + Structured questions | 50 | Combined with marks scored in biology/physics and scaled to 100% |

Single paper **(45mins)** with 10 mcq’s worth 10 marks + variable numbers of structured questions worth 40 marks. Students may be asked to describe simple experiments and draw diagrams to test a given scientific concept in the structured questions