

UTTERMOST

Harroan Uttermost

2024
SERIES

Competency based

chemistry

Revised
and
Updated

Learner's book

Unlock your full competency potential

Book

4





HARROAN-UTTERMOST



Chemistry

New curriculum learner's book
for s.4

Student's information.

This book belongs to:

Name

School

Class

Stream.....

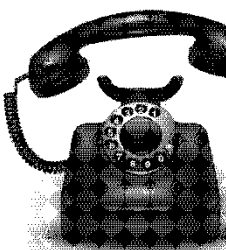


Contact us

0757998376

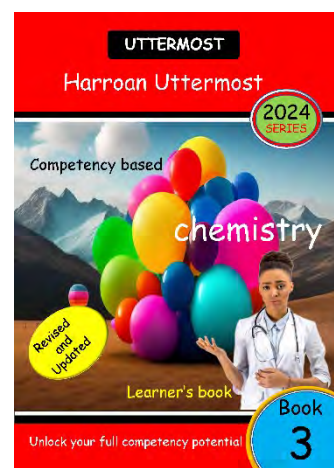
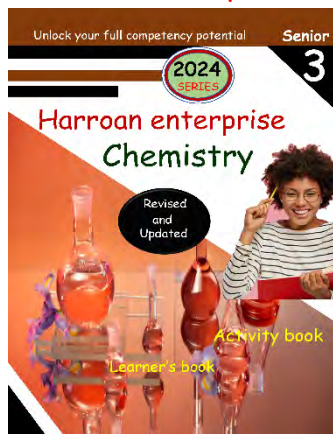
0780492637

i of 210 pages



Changes in 2024 versions

1. Two versions have been released for each book. That's Harroan uttermost and the Harroan enterprise.



Harroan enterprise versions are first editions of our new book full of scenario & practical based questions which will unlock the learners competence potential.

Harroan uttermost versions are our third editions improved from our 2023 versions with new features like use your brain power, answer sheet template, improved guide notes & others

2. Full teaching guide books for all the versions have been made though each book has a different structure. A sample of the uttermost teaching guide appears in this sample. The ones for enterprise also appear in the enterprise sample versions. For uttermost versions: learning objectives, learning outcomes & sample activities of integration have been pushed to teaching guides

3. key question has been introduced in uttermost versions. The key question in learner's books provide a focus for the lesson period.

4. Use your brain power has been introduced in uttermost books with critical thinking and problem-based questions meant to unlock the learner's competency potential. The answers to these questions appear in the teaching guides.

5. an answer sheet template has been introduced to provide enough space for learners to answer the questions & write other important notes

5. Guide notes in the uttermost series have been improved. The guide notes introduce learners to a lesson period but they don't answer the lesson key question. This makes learner's to research and brainstorm on the question to get the desired solutions. The answers for all the activities appear in the teaching guide.

Chapter one

Oxidation and reduction reactions



By the end of this chapter, you should be able to;

- Understand the process of oxidation and reduction
- Explain the importance of oxidation and reduction in chemical industry
- Explain redox reaction in terms of electron transfer
- Understand the changes that take place during electrolysis of some compounds.
- Investigate oxidation and reduction in a selection of reactions
- Describe the contribution of metal extraction to the economy of Uganda.
- Write ionic equations and explain reactions in terms of electron transfer.
- Describe electrolysis of aqueous solutions



1.1 introduction to oxidation and reduction

Key question: How are the oxidation and reduction reactions important in chemical industries.

Guide notes

Oxidation and reduction are essential concepts in chemistry that play a crucial role in various natural and human-made processes. These reactions involve the transfer of electrons between substances, leading to changes in their oxidation states. Understanding oxidation and reduction is not only important for academic purposes but also for making sense of daily life phenomena and their connection to the chemical world. In our everyday lives, we encounter countless examples of oxidation and reduction reactions. Here are a few common scenarios where these processes are at play:

1. Fireworks: It involves both oxidation and reduction.

Oxidation: In fireworks, the oxidizer provides necessary oxygen to support combustion. Common oxidizers used in fireworks include nitrates, chlorates, and perchlorates. During the combustion process, the oxidizer supplies oxygen to the reaction allowing the fuel to undergo oxidation. The fuel (metal or metal salt) reacts with oxygen and releases energy in the form of heat, light and sound.

Reduction: The reduction occurs when the fuel, typically a metal or metal salt, undergoes a chemical reaction and gains electrons. This reduction is responsible for producing vibrant colours that we see in fireworks displays. Different metal compounds are used to create specific colours when they are heated and undergo reduction reactions



Reduction is responsible for producing vibrant colours that we see in fireworks displays

The oxidizer supplies oxygen to the reaction allowing the fuel to undergo oxidation.



Rusted iron

2. Rusting of Iron: One of the most common examples of oxidation is the rusting of iron. When iron comes into contact with oxygen and water, it undergoes a chemical reaction called oxidation, forming iron oxide (rust). This process demonstrates the transfer of electrons from iron to oxygen, leading to the corrosion of metal objects.

challenger



1. During the extraction of aluminum from its ore, a large amount of electricity is required. How does the process of reduction play a role in the extraction of aluminum, and why is such a high amount of electricity needed?
2. In the process of photosynthesis, plants convert carbon dioxide and water into glucose and oxygen. Discuss the role of oxidation and reduction in this vital biological process.

Group activity:

Group activity:

- 1) Research and explain the terms oxidation and reduction in terms of:
 - i) loss or gain of oxygen
 - ii) loss or gain of hydrogen
 - iii) transfer of electrons
 - iv) change in oxidation number

- 2) The reaction between copper(II) oxide, CuO and carbon, C is an example of a redox reaction.
 - (a) Write a balanced chemical equation for the reaction that takes place.
 - (b) State the names of the reactions that take place for:
 - (i) Copper (II) oxide, CuO .
 - (ii) Carbon, C .
 - (c) Identify:
 - (i) Oxidised substance.
 - (ii) Reduced substance.
 - (iii) Oxidising agent.
 - (iv) Reducing agent.

Use your brain power!



1. A car engine burns gasoline as fuel. Discuss the role of oxidation and reduction in this combustion process and explain what products are produced.
2. Hydrogen peroxide is used as a bleaching agent. Discuss the oxidation and reduction processes involved in the bleaching action of hydrogen peroxide.
3. In the process of electrolysis, molten lead chloride is electrolyzed to produce lead metal and chlorine gas. Describe the oxidation and reduction reactions occurring during this electrolysis process.

**The book contains a full
teaching guide**





Why a new version each year?

Harroan releases new versions of learner's books each year in order to align the content with evolving education needs and standards. Producing new versions ensures that the content remains current & up to date. This allows learners to learn most relevant and accurate information. Education methodologies & pedagogical approaches evolve over time, incorporating new insights & strategies to enhance student learning.

2024 books on market

1. Uttermost series - 2024 series

Harroan uttermost versions are our third editions improved from our 2023 versions with new features like use your brain power, answer sheet template, improved guide notes & others. This sample contains a few pages of the Harroan Uttermost books. All other Harroan Uttermost books have the same structure.



Contact us

0757998376
0780492637



Selling structure

The 2024 versions have two printing formats;

1. The standard clear format print- the one used in 2023 versions
2. The best quality hd print- the newly introduced one



Advert break

Book pages 210

This page is not part of the book. It shows Harroan books on market

Color printing

Book(s) price	Price	Additional benefits (Tp costs, free teaching guide, free other versions)
1 learner's book	25,000	None
1 teaching guide	30,000	None
Learner's book + teaching guide	50,000	None
5 to 9 learners' Books	20,000 each	None. The books can be of different classes or subjects
10 to 19 learners' Books	18,000 each	None. Still the books can be of different subjects or classes
20 to 29 learners' Books	17,000 each	Free transportation costs, books can be of different subjects or classes
30 to 39 learners' Books	16,000 each	Free transportation costs, books can be of different subjects or classes
40 to 49 learners' Books	15,500 each	Free transportation, books can be of different subjects or classes
50 to 69 learners' Books	15,000 each	Free transportation costs, free teaching guide, books can be of different subjects or classes.
70 to 99 learners' Books	15,000 each	Free transportation costs, free teaching guide, 1 free book of Harroan enterprise, books can be of different subjects or classes
100 or more learners' Books	15,000 each	Free transportation costs, free teaching guide, 1 free book of harroan enterprise & its guide, books can be of different subjects or classes



2. Enterprise series - 2024 series

Harroan enterprise versions are first editions of our new books full of scenario & practical based questions which will unlock the learners' competence potential. The books are not practical books though they contain a practical view section with competence based practical questions. They are different from Harroan Enterprise plus that they concentrate on a particular class. They contain a full separate teaching guide.

Book pages 210

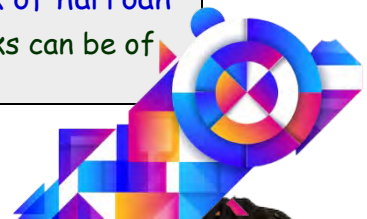
Order starts from 10

For enterprise

Color printing

Advert break

This page is not part of the book. It shows Harroan books on market



Selling structure for standard clear print out. Order starts from 10



Contact us

0757998376
0780492637



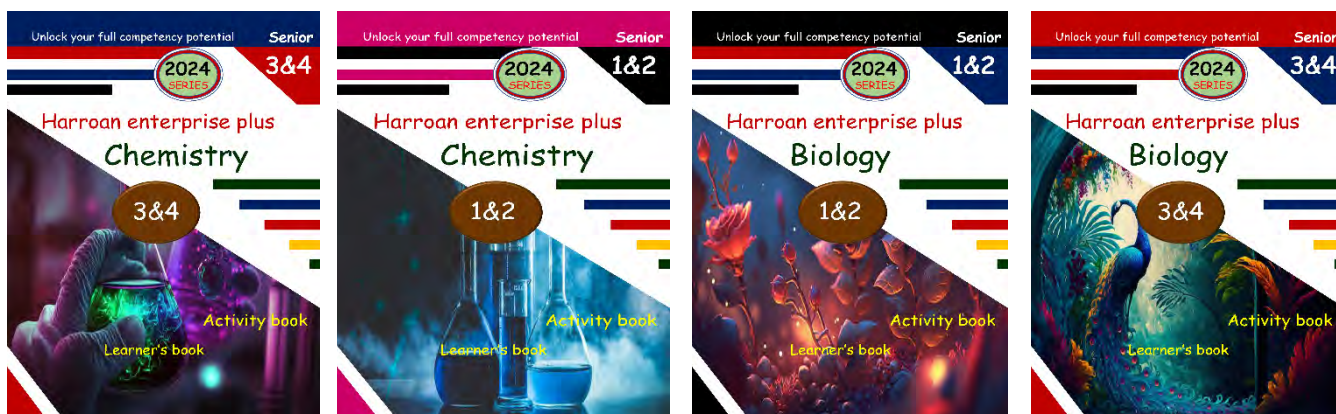
Book(s) price	Price	Additional benefits (Tp costs, free teaching guide, free other versions)
10 to 19 learners' Books	18,000 each	None. Still the books can be of different subjects or classes
20 to 29 learners' Books	17,000 each	Free transportation costs, books can be of different subjects or classes
30 to 39 learners' Books	16,000 each	Free transportation costs, books can be of different subjects or classes
40 to 49 learners' Books	15,500 each	Free transportation, books can be of different subjects or classes
50 to 69 learners' Books	15,000 each	Free transportation costs, free teaching guide , books can be of different subjects or classes.
70 to 99 learners' Books	15,000 each	Free transportation costs, free teaching guide , 1 free book of Harroan Uttermost , books can be of different subjects or classes
100 or more learners' Books	15,000 each	Free transportation costs, free teaching guide , 1 free book of harroan Uttermost & its guide , books can be of different subjects or classes

Order starts from 10 For enterprise series
Advert break

This page is not part of the book. It shows Harroan books on market



2. Enterprise plus series - 2024 series It's of 2 classes



These are Harroan enterprise but of combined classes. Each book is on 300 pages with the same structure as Harroan enterprise. They contain scenario questions from combined classes though on comparing with single class Harroan Enterprise, they have less questions but all topics covered. **Order starts from 10 For enterprise series**

Book(s) price	Price	Additional benefits (Tp costs, free teaching guide, free other versions)
10 to 19 learners' Books	25,500 each	None. Still the books can be of different subjects or classes
20 to 29 learners' Books	24,500 each	Free transportation costs, books can be of different subjects or classes
30 to 39 learners' Books	23,500 each	Free transportation costs, books can be of different subjects or classes
40 to 49 learners' Books	23,000 each	Free transportation, books can be of different subjects or classes
50 to 69 learners' Books	22,500 each	Free transportation costs, free teaching guide , books can be of different subjects or classes.
70 to 99 learners' Books	22,500 each	Free transportation costs, free teaching guide , 1 free book of Harroan Uttermost, books can be of different subjects or classes
100 or more learners' Books	22,500 each	Free transportation costs, free teaching guide , 1 free book of harroan Uttermost & its guide, books can be of different subjects or classes

3. 2023 & 2022 series

2023 & 2022 versions still available for sale. 1 book for 20,000. 15,000 for 10 or more copies

Contact us

0757998376

0780492637



