

CHEMISTRY ITEMS 2025 APRIL/MAY
UGANDA CERTIFICATE OF EDUCATION
PREPARED BY TR. MUSINGUZI IBRAHIM

SECTION A FORMAT

The items in this section will always be compulsory

ITEM 1

Kakumiro District Development Officials recently cleared a group of youths in the district to setup a bakery. However, the officials have cautioned the youths to use sustainable and environmentally friendly packaging materials for their bakery products.

As a result, the youths have organized a meeting to discuss possible alternative packaging materials.

Task.

As a chemistry learner, write a short message you would deliver to the youths upon invitation in your message:

- (a) Explain**
 - (i) Categories of materials.**
 - (ii) The suitability of the materials.**
- (b) Advise the youths on the choice of the materials.**

ITEM 2

Joan and Priscilla went to wash their clothes around the nearby well surrounded by racks. Joan used detergent T and Priscilla used detergent Q two days later, Joan realized that her white clothes had some dirty marks yet she rinsed them with water several times. Priscilla, on the other hand never had such complaints. Joan is now frustrated and cannot understand what went wrong. As a result, both Joan and Priscilla have approached you to help them understand their situation.

Task.

As a chemistry learner, write a message you will share with the two ladies, In your message:

- (a) Explain categories of products T and Q used by the two ladies**
- (b) Help Joan to understand how the product works.**

(c) Advice the two ladies on the challenges associated with the use of the products.

ITEM 3

JJK is in the process of making good and strong windows for his newly constructed house without affecting the environment. He is aware that there are various materials on the market for making windows.

He also knows that in order for one to produce good quality windows; he should select the right material with suitable qualities and properties. However, he is still confused with the choice and has approached you for some advice.

Task.

As a chemistry learner:

(a) Explain

- (i) Categories of materials.**
- (ii) The sustainability of the materials.**

(b) Advise Wig on the choice of the materials.

ITEM 4

Akwa, a 25 year old woman always visits her grandmother, whenever she falls sick. She trusts her grandmother's skill as a traditional healer.

One day, on her way from a well with her friend, she fell down and felt pain in the knees but had no bruises. Her friend rushed her to one of the local health centers, instead of taking her to her grandmother. At the health centre, she was given aspirin tablets.

To her surprised, after a rest she felt relieved from the pain. She has approached you to help her understand why the pain disappeared.

Task.

As a chemistry learner, write a message you will share with Akwa. In your message, include:

- (a) The category of the product.**
- (b) The function of the product.**
- (c) Advice to Akwa on the challenges associated with the use of the products.**

ITEM 5

In Kyakayege village, Sembabule district, a building has been completed but several huge cracks have developed and is about to collapse. Residents are planning to arrest and beat the construction workers accusing them of using sub-standard materials.

The Chairperson Local Council 1 together with the community development officer have organized a community meeting to talk to the residents and discuss the other possible alternatives to rebuild the society's house without affecting the environment.

Task.

Use your chemistry knowledge to:

Explain the

- (i) **Categories of materials.**
- (ii) **Suitability of the materials.**
- (iii) **Advise residents and the concerned authorities on the choice of the materials.**

ITEM 6

Jasmine opened up a new restaurant in one of the towns in Arua District. Her restaurant often receives many customers during lunch time, because of the good taste of the food she serves. While the other restaurant owners in the same locality often receive very few or no customers at all. This has created jealousy resulting into regular quarrels between Jasmine and the other restaurant owners.

The Local Council Chairperson of the area understands the causes of the quarrels are the ingredients the restaurant owners use.

As a result, the chairperson of the area has secluded a meeting to solve the issue at hand.

Task.

As a chemistry learner, write down a short message you would if you were invited to the meeting.

In your message,

- (a) **Categories the ingredients.**
- (b) **Explain the suitability of the ingredients.**
- (c) **Advise the restaurant owners on the use of the ingredients.**

SECTION B FORMAT

ITEM 7

One of the large scale uses of sulphuric acid is in the making of paints. To ensure that sulphuric acid is readily available and at a cheaper cost, government has cleared a local investor to set up a sulphuric acid production plant in Kilembe town in Kasese District.

However, the community is concerned about its environmental effects and their valuable land about to be taken by the investor.

The locals are wondering how the production of sulphuric acid will be done. Consequently, the class teacher has appointed you to sensitize the learners on the new developments.

Task.

Prepare a brief presentation you will make during the meeting.

ITEM8

Due to increased prices and demand of copper for use in electrical vehicles worldwide, the government is therefore, looking forward to revive the copper production in Kilembe, a suburb in Kasese District Uganda. The local residents are however, worried of its environmental impacts.

The locals also do not know how the process of extraction of copper will be done.

A radio talk show has been organized on one of the local radio stations by the District Development Officer (DDO) and the Local council representative to sensitize the locals on the issues at hand.

Task.

As a learner of Chemistry, prepare a presentation you would make upon invitation.

ITEM 9

Tororo District is a district that is developing at a fast pace. There are many trading centers that have been established in the different villages. Many swamps and forests have been reclaimed and filled with new buildings, stone quarrying is the order of the day. Recently both the vegetation and wells have started drying up, and yet the little water that is available is not fresh. The few residents in the different villages that practice crop husbandry also say that seasons have changed and this has caused famine in some parts of the district. All these happenings have left many of the district officials wondering.

A sensitization workshop is to be organized by the Chairperson Local Council V through the different village environmental management committees.

Task

As learner of Chemistry, present the message you will share when called upon.

ITEM 10

As a result of increasing population in Wakiso District, many of the natural forests and swamps have been destroyed to create space for construction and provide charcoal among others. This has attracted the attention of the government.

As a result, the government through the National Environment Management Authority (NEMA) is planning to create awareness to the people of Tororo District through sensitization workshops in the different villages in the district.

Task.

As a Chemistry learner, prepare a short presentation that you will deliver during the workshop when invited.

ITEM 11

A newly constructed soap factory in your area has run short of one of the essential raw materials, sodium hydroxide. This due to the ban on the importation of sodium hydroxide.

As a result, the factory management is currently constructing a sodium hydroxide production plant near their soap factory.

However, the community is worried of its environment impacts and their valuable land being taken up by the new plant.

The locals are also not aware of how the production of sodium hydroxide will be done. Consequently, the Local Council Chairperson (LC1) has organized a sensitization workshop where the factory management and same local representatives have been invited.

Task

As a chemistry learner, write a brief message that you will deliver when called upon invitation.

ITEM 12

Rushekye hills in Kisoro District Uganda are rich in iron deposits. The government is therefore, setting up an iron and steel rolling factory to make the best use of the iron deposits in this village.

The Local residents are however, protesting the establishment of the plant in their area, claiming that the government is going to steal their valuable land and there is no importance of a plant to them.

The locals also do not know how the process of extraction of iron will be done.

A radio talk show has been organized on one of the local stations by the District Development Officer (DDO) and the Local Council representative to sensitize the locals on issues at hand.

Task

As learners of Chemistry prepare a presentation you would make upon invitation.

ITEM 13

In Osukuru village most people survive on charcoal burning, animal husbandry, crop husbandry, stone quarrying among others. Some have small mills to process rice, maize, and millet among others. Currently the crops are drying up, animals are dying, and wells are drying up. Yet the little water that is available is also not fresh. These happenings have left many of the villages wondering why.

A sensitization workshop is to be organized to explain the existing situation in the village. The theme for the workshop is "BECOME PART OF YOUR ENVIRONMENT"

Task

As a learner of Chemistry, prepare a message you will deliver during the meeting upon invitation.

ITEM 14

River Rwizi is located in Mbarara; South Western Uganda people around the river survive on sand mining, crop husbandry, animal husbandry and brick making. Of recent, the water levels have reduced drastically and even the little water available is not fresh. The fish is dying. These happenings have left the local authorities worried.

The city mayor has called for a workshop to sensitize the local community on the existing situation around the river.

Task

As a chemistry learner, write a message you will deliver if you were invited for the workshop.

ITEM 15

Soap is one of the common substances that is used to facilitate washing. Of recent, there has been a countrywide complaint to the government of the high costs soap for use. This is partly because of the few industries producing soap is readily available and at a cheaper cost, recently the government cleared of the one of the local investors to set up another soap production plant in one of the villages in Tororo District. However, the community is concerned about its environmental impact and their valuable land that is about to be taken by the investor.

The community members are also wondering how the process of soap production will be carried out.

As a result, the chairperson science club in your school has chosen you to sensitize the members of the club on the situation.

Task.

As a chemistry learner, make a write up you will use during the presentation if you were invited.

ITEM 16

Due to the need to provide its citizens with alcohol based sanitizers, government, is planning to set up an ethanol production plant with minimal environmental impact in one of the villages in Mukono District.

However, the locals in the selected village are wondering how the production process will be carried out. As a result, a sensitization workshop has been organized in the village by the government through the Local Council Chairperson.

Task

As a chemistry student, make a write up you will use during presentation if invited.

ITEM 19

In a small town near a landing site, the water discharged into a local river from a small industry contains traces of hydrochloric acid which is unfavorable to the fresh water fish. The industry is considering using solution Y to neutralize the acid in the water without affecting the life of the fish. This is because the reaction between Y and hydrochloric acid may produce amounts of heat that are unfavorable yet fresh water fish thrives well only if a heat of change of 2.47-2.52Kj occurs in water.

You are provided with the following

Solution Y

Solution X which is a sample of the acidic fresh water

Some apparatus.

Task

- (a) Design an experiment you can use to determine the amount of heat evolved.**
- (b) Carry out the experiment and determine the amount of heat evolved.**
- (c) Analyze your results and hence draw possible conclusion.**

PRACTICAL ITEMS

ITEM 17

A metal scrap recycling company is exploring an innovative method to generate heat in food warmers. Their idea involves using Iron scrap in a process that displaces copper (II) ions from a solution. This approach would potentially reduce use of polluting fossil fuels. However the company needs to determine if this method can produce a significant amount of heat, ideally above 50,000 Joules, to be a viable solution.

You are provided with:

Solid P which is sample of Iron filings from scrap

BA1 which is Copper (II) sulphate solution

Some apparatus.

Tasks

- (a) Design an experiment that can be used to determine the amount of heat involved.
- (b) Carry out the experiment and determine the amount of heat involved.
- (c) Analyze the results and draw the conclusion.

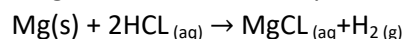
ITEM 2

A group of senior two learners put a piece of chalk in a plastic beaker and added a colorless liquid they found in the laboratory to it. They were surprised to see a reaction taking place.

They pounded the chalk and added the colorless liquid to the powder. This time the reaction took a shorter time. This confused them the more and sought for an explanation from the teacher. The teacher tried to explain the effect of particle size on the reaction rate but it remained unclear to the learners.

For the learners to understand it better, he demonstrated using the reaction of magnesium and hydrochloric acid.

Magnesium reacts with hydrochloric acid according to the following equation.



You are provided with the following:

BA1 which is hydrochloric acid

Magnesium ribbon or granules

Magnesium powder

2 plastic beakers

1 thermometer

A weighing balance

Task

As a senior four learner,

- (a) Design an experiment the teacher might have carried out to help the learners understand the effect of particle size.

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- (b) Carry out the experiment and record your findings

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- (c) What can the senior two learners deduce from your findings

ITEM 3

A water quality analyst was taken by water and sewerage cooperation to establish the quality of different water sources in Mubende district so as to determine which of the water sources could be suitable for cooking, brewing, drinking, laundry washing and industrial work. However, he was still researching about how best he could accomplish the task.

You are provided with;

Five water samples A, B, C, D, and E

Soap solution

Some apparatus

Task

Design and carry out an experiment to help the water analyst

ITEM 4

A lady relocated from a village where they use tap water to a village where they use borehole water. She realized that the expense on soap shot up and started blaming it on her children. However, her neighbor told her that the volume of soap solution used depends on the type of water used. She would want to investigate this observation.

You are provided with;

BA1 which is the soap solution

For more items and solution contact Tr Musinguzi Ibrahim 0759514302/0765821032

Located in Igayaza –kakumiro along Hoima road for both biology and chemistry

BA2 which is tap water

BA3 which is borehole water.

Task

(a) Design an experiment to help the lady understand the situation as told by her neighbor.

(b) Carryout the experiment and record your findings.

(c) Use your data to help the lady understand her neighbor.

CHEMISTRY ITEMS 2025

UGANDA CERTIFICATE OF EDUCATION

PREPARED BY TR. MUSINGUZI IBRAHIM

CHEMISTRY S.1

0759514302/0765821032

1. Many people have studied science in a variety of ways for different purposes the science has many branches like chemistry, biology, physics. In a science competition, they were looking for the member to show how they understand some things in chemistry. Assuming you were chosen;

a) Give your understanding about what chemistry is. (02 scores)



b) Show how important chemistry has been to the economy of Uganda in any two ways explained. (04 scores)

2. In Uganda today, many people have complicated diseases like diabetes, cancer, ulcers, fluctuating blood pressure and many other. Mr. Kaliro has been with diabetes and fluctuating blood pressure. Mr. Kaliro found a piece of document from a trusted researcher from the internet as shown below.

Black jack herb (*Bidens pilosa*) shows potential benefits for managing blood pressure and diabetes. Research by **Choi et al. (2016)** in the journal *BMC Complementary and Alternative Medicine* suggests that its antioxidant properties may help reduce blood pressure and promote vasodilation. An animal study by **González et al. (2018)** in *Frontiers in Pharmacology* indicated a significant reduction in blood pressure, although human trials are still needed for confirmation. Moreover, a study by **Adewusi et al. (2014)** published in *Journal of Medicinal Food* suggests that black jack herb may help regulate blood sugar levels and improve insulin sensitivity, potentially benefiting diabetes management.

- a) Mr. Kaliro wants you to test for him if this works. To go on;
i) State the hypothesis you want to test. (01 score)

- ii) What are the important things you are to focus on when testing/experimenting the hypothesis you have stated? (04 scores)

- b) If you are to do that test in the laboratory, how can you ensure that you are safe there??
(03 scores)

3. Mary prepared very good food for her husband before he came back home. The food was fried fish and boiled rice. When her husband came back home, before she bought him food, he told her that she had cooked fish. She felt not good because she wanted the food to be a surprise to her husband.

- a) (i) As a learner of chemistry, how do you think the husband was able to detect which kind of food she had made?(02 scores)

- (ii) How would she have stopped him from knowing?(01 score)

- b) What change in state of matter happened for the husband to know the food the wife had cooked? (01 score)

- c) Write 2 business ideas that use the main process you wrote in a)(i). (02 scores)

4. a)(i) You have been told to create a pot as a project. Identify which material can be used for making pots. (01 score)

- (ii) Of what importance can the pots be in our community? (02 scores)

- b) Why would you choose that material? (03 scores)

- c) What challenge do you get when using the pot made of the material you identified in a) above.

CHEMISTRY SENIOR TWO

Section A

1. An element ${}_{13}^{27}X$ has been bought to be used in making a saucepan as a project by members of Science club in living hope Christian High school. To get ready to talk about the project on the exhibition day, prepare the information to the tasks below.

- a) What kind of element are they choosing to use? (03 scores)

- b) (i) What makes you believe that this element will be able make a good saucepan for them? (03 scores)

- c) Advise the science club members on the possible dangers associated with the long term use of the saucepans made of the element X? (02 scores)

SECTION B

2. An investor is preparing to build a Oxygen producing company in Ssekiwunga as a means to develop the community. The chairperson of Ssekiwunga village has requested that they hold a meeting with the scientists to work in the industry so as to know more how they will produce the oxygen gas and how the youths of the community will benefit from having the industry in their community. The elderly people also want to know how dangerous the process of production of oxygen will be to the environment.

Task: As a learner of chemistry, make a write up of answers you expect the scientists to give according to the requests of the chairman and the elderly people in Ssekiwunga. (09 scores)

3. Due increase in population in one town in Tororo District, many natural forests have been cleared to provide charcoal for use as fuel and swamps have reclaimed to create

space for settlement. Some of the youths have resorted to sand mining and bricklaying. A few that practise crop husbandry claim that seasons have drastically changed. These happenings have left many of the residents wondering.



As a result, the government through the Town clerk is planning to create awareness to the residents through a sensitization workshop organized at the town hall.

Task:

Assuming you are invited to give a speech on behalf of your school, note down what you will talk about. (08 scores)

(hint: your answer should include category of natural resources with reason and example, how human activities destroy natural resources with suggested solutions, and the importance of the natural resources explained

SECTION A

Item 1

People in your community don't know the reasons of studying chemistry and its contributions to the development of different sectors in Uganda. This has hindered the study of chemistry at all levels of education. The ministry of education have prepared sensitization meeting in your community. You have been pointed as one of the presenters

(a)Point out the reasons of studying chemistry you would give to the community members (5scores).

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(b) Briefly explain contributions to the development of different sectors in Uganda you would give out. (10scores).

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Item 2

Ayamba and Neema s1 students at kijangi seed were in the laboratory and observed different laboratory apparatus. However they entered in lab without teachers instructions and so they broke some apparatus and chemical poured on their skin. This worried the s1 students

Task

(a) identify the apparatus broken by students pointing out their functions (8 marksscore)

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(b explain the rules that could be followed by Ayamba and Neema to prevent the occurrence of such events next time while in laboratory (7marks)

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SECTION B (attempt one item in this section)

Item 3

A Bunsen burner is a heating apparatus commonly used in the laboratory ; this is because you can easily change the flames it can produce to the one desired. A primary student got to hear about the change of flames on a Bunsen burner and thinks about it as magic.

Task

(a Help the student to know different parts bunsen burner pointing out the function of each parts using a labelled diagram (12marks)

(b Inform the primary student to know differences between luminous and non luminous flames (8 mks)

Item 1

Kabibu after failing to pass his primary leaving examinations, he wanted to join a technical institution so that he could pursue vocational studies. His mother told him that she never had money for him to join a technical institution. Kabibu was advised to start up a small business that does not require much capital and he has got an idea of making **ropes** but he is wondering the proper type of material to use. Kabibu has been told that you may be of help and he has decided to contact you.

Task:

Use your chemistry knowledge to;

(a) Explain;

(i) The category of the material to be used.

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..... (ii) The suitability of the material to be used.

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..... (b) Advice Kabibu on the challenges of the material.

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Item 2

In a certain company, they have plans of developing alloys from copper, zinc, carbon, silicon and iron. They want to make alloys that are strong and long lasting but they need advice on what to consider before starting the process.

Task:

As a chemistry student

a) Point out the classes of elements that the alloys can be developed from

b) Explain how the elements are suited for making the alloys

[illegible]

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c) Suggest some of the uses of the alloys

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d) Explain one impact of the alloys on the environment

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SECTION B

Part 1(respond to one item from this part)

Item 3

Air is a mixture of different components. It contains 21% oxygen. Due to a wide spread of respiratory illnesses caused by COVID-19, there was an increased demand for oxygen by patients in hospitals. The government supply of oxygen is not enough and is planning to set up an oxygen production plant with minimal environmental impact.



However, the science club members in your school would like to know how the production process will be carried out.

Task;

As a chemistry learner, prepare a write up you will use during the presentation. (09scores)

4

Kisoro rocky hills in southwestern Uganda depend on stone quarrying as a primary source of livelihood. However, extensive quarrying has resulted into seasonal changes, water shortage, and reduced air quality and water contamination.



Basing on this background, the government wants to make a sensitization about the issue

Task

As a chemistry student, write a message that the government would use in the sensitization

Item 5

Due to increased industrialization and settlement in towns, there has been an increased destruction of natural resources and this has attracted attention from National Environment and Management Authority (NEMA).

There is a plan to make a sensitization countrywide.

Task

As a chemistry student, make a write up to sensitize your community about the matter

Best wishes *TR. MUSINGUZI IBRAHIM*
0759514302/0765821032 for more items

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