

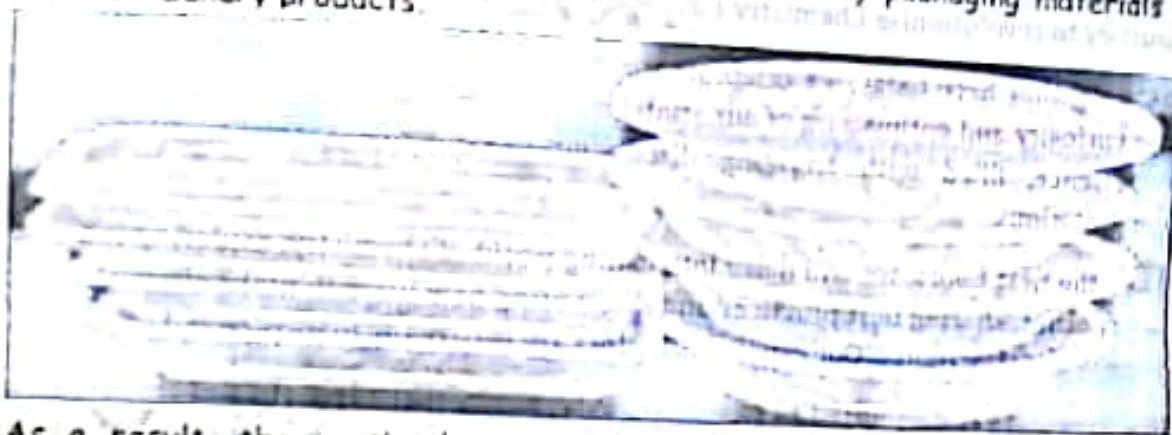
# DISCUSSION ITEMS:

## SECTION A FORMAT

The items in this section will always be compulsory.

### Item 1.

Mpigi 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 a nearby well, surrounded by rocks. 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) Advise 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 suitability 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 centres, 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.

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 organised 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.

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 cause of the quarrels are the ingredients the restaurant owners use.

As a result, the chairperson of the area has scheduled a meeting to solve the issues at hand.

#### Task

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

In your message,

- (a) categorise 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 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 sensitise the learners on the new developments.

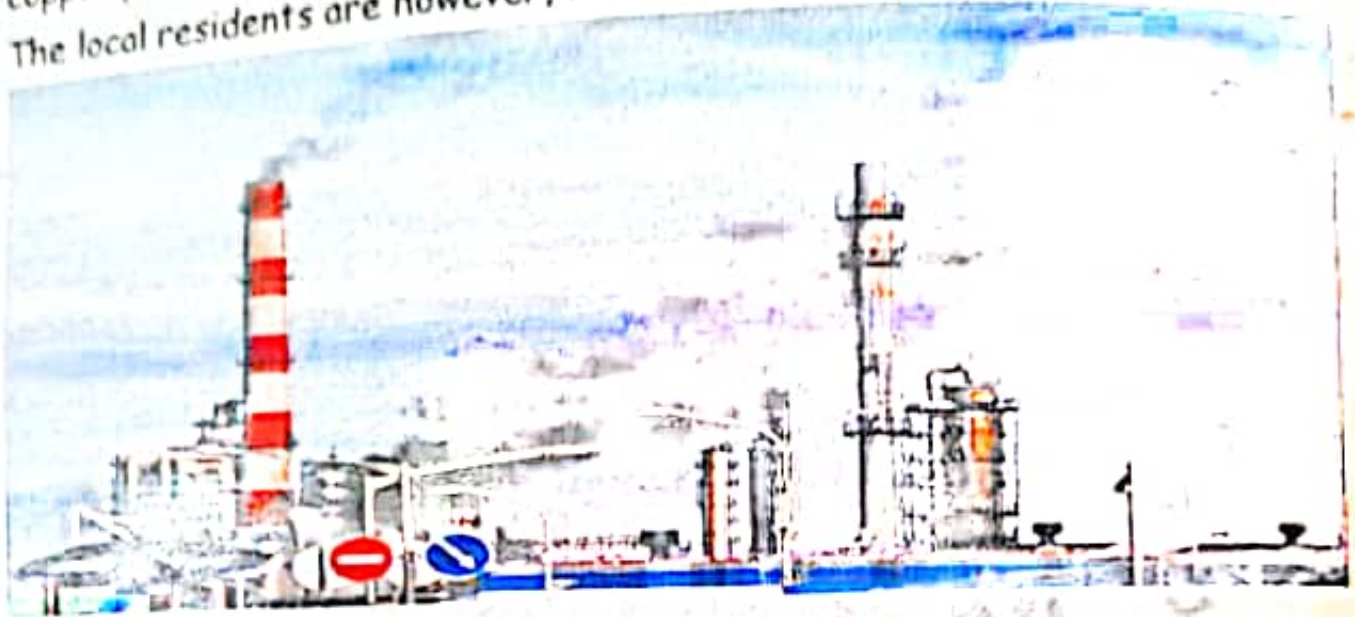
#### Task

Prepare a brief presentation, you will make during the meeting.



Item 8.

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 district is developing at a fast pace. There are many trading centres 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 a 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 for 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 organized 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 some local representatives have been invited.

#### Task

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

### Item 12.

Rushekye hills in Kisoro District Uganda is 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 organised on one of the local radio stations by the District Development Officer (DDO) and the Local council representative to sensitise the locals on the issues at hand.

### TASK

As a learner 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, 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 sensitisation workshop is to be organised 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 happening 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.

15. Soap is one the common substances that is used to facilitate washing. Of recent, there has been countrywide complaints to the government of the high costs soap for use. This is partly because of the few industries producing soap in the country. To ensure that supplies of 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.

16. Due to 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.



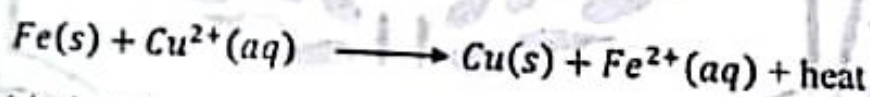
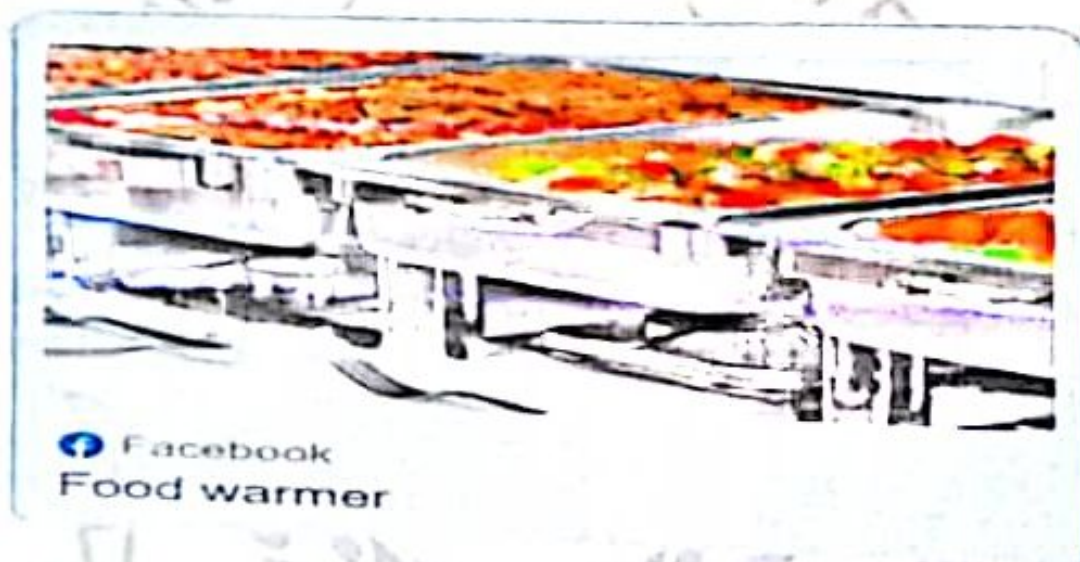
However, the locals in the selected village are wondering how the production process will be carried out. As a result, a sensitization workshop has been organized in the village by the government through the Local Council Chairperson.

**Task:** As a chemistry student, make a write up you will use during presentation if invited



### PRACTICAL ITEMS.

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 fillings from scrap

BA1 which is Copper (II) sulphate solution

Some apparatus.

Tasks

- Design an experiment that can be used to determine the amount of heat involved.
- Carry out the experiment and determine the amount of heat involved
- Analyse the results and draw the conclusion

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 unfavourable to the fresh water fish. The industry is considering using solution Y to neutralise 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  $2.47\text{--}2.52\text{kJ}$  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.

Chemical Science