

## S3 CHEMISTRY HOLIDAY PACKAGE

### ITEM ONE

In Moyo Community, many people use household items for food and medicine, but they often don't understand the chemistry behind them. A community health worker, Ms. Achieng, noticed that some families rely heavily on lemon water, for baking cakes when mixed with baking soda, while others use antacid tablets when they have heartburn.

During a community education meeting, some residents raised questions on how lemon water help make cakes rise, antacid tablets help relieve heartburn, and if there are any environmental impacts if these chemicals are used regularly.

Ms. Achieng has now invited you, a chemistry student, to explain to the community the science behind these substances.

#### Task:

As a learner of Chemistry, help Ms. Achieng to clearly know;

- (a) The category of the substances used in the community.
- (b) How the substances function to suit their purpose.
- (c) Advice the community on the environmental impacts associated with long term use of the substances and their mitigations.

### ITEM 2

Science club members of Kyadondo SS were investigating the reaction of period 3 elements with water. Ngambo, a member of the club first considered two elements X and Y and the following observations were obtained for the reaction with water.

A: Observations; Reacted vigorously while floating on surface of cold water forming an alkaline solution with evolution of hydrogen gas.

B: Observation; Reacted slowly with cold water forming alkaline solution and hydrogen gas but when heated with steam, forming a white solid and hydrogen gas

**TASK:** As a learner of chemistry;

- (a) State the category of elements X and Y.
- (b) Predict the reaction of the other elements in period 3 with water.
- (c) Advise Ngambo about the dangers associated with the reaction of these elements with water.
- (d) Help the science club members identify elements X and Y.

### ITEM 3

At Katosi landing site, residents use Lake Vitoria as their main source of water which provides water that is not clean enough for use. The leaders urged the government to set up a treatment plant in order to provide safe water. However, leaders were requested to employ a skilled resident who is acquainted with how water is made safe for use, stages involved in purification and the challenges the project may face in the town.

#### **TASK:**

As a chemist, provide the residents with the information they need to be employed.

### ITEM 4

Luwero, one of the most sparsely populated districts in Uganda is well known for being a charcoal production hub. Most of the youths residing in Luwero are involved in cutting down trees, burning the wood and the final products used and the rest exported to other regions. The residents are thereby frustrated with the toxic fumes from the activities. The air, water and the soil have always changed over time in Luwero district. This has however attracted the attention of the officials from the National Environment Management Authority (NEMA). The officials are planning to create awareness to the people of Luwero and the country through sensitization workshops organized in Luwero district and the different districts.

You have been approached to guide the officials on what to present.

**Task;** As a learner of Chemistry, prepare a write-up the NEMA officials will use during the work shop.

### ITEM 5

Kimuli prefers cooking using natural gas as he believes it facilitates faster food preparation. One time as Kimuli was cooking his meal, the burner lit off and couldn't light again. He wondered how this could happen and invited his friend to clearly explain to him what could have caused that. However his friend explained to him that the gas in the cylinder was over and advised him to visit the nearest Total Petrol station for a refill. You have been contacted for help.

**Task;** As a learner of Chemistry'

- a) Explain to Kimuli the category of the gas product used.
- b) Suggest the properties of the gaseous product that makes it useful in daily life.

**END**