

**S.3 AND S.4 RESOURCEFUL ITEMS
CHEMISTRY HOLIDAY PACKAGE
MAY 2024.**

Item 1:

Ethanol is a renewable fuel made from various plant materials. Due to wide spread of COVID-19 in Uganda today, there is an increased demand for ethanol to make hand sanitizers to reduce on the wide spread of the disease.

The government supply for hand sanitizers is not enough but the ministry of health has aired out that local ethanol (waragi) can even work best for this activity.



However, your community members have no idea on how to produce ethanol locally and yet they would love to make money.

Task;

As a student of chemistry, prepare a write-up you will use to educate your community members so they can make hand sanitizers and make money.

Item 2:

At KIYALA HIGH SCHOOL, during rainy season, s.1 students in boarding normally collect rainy water for bathing, they noticed that, it just needs a little volume of soap to form lather easily with this rainy water and this left them wondering why since they were comparing it with the water from the well which they knew always uses a lot of soap, this left them wondering why. In addition to that, one day, one student jokingly picked a litmus paper which she had stolen from the lab, and dipped it into rainy water, all of a sudden, the litmus paper changed the colour, this worsened the situation all together.

Task;

With your knowledge of chemistry;

- a) Explain to these s.1 students;
 - i) How rainy water is formed.
 - ii) The type of water which rainy water is.
- b) i) suggest which colour type of a litmus paper this student used, to which colour did it change to, and why?

Item 3:

In Idupa village, children always buy balloons, inflate them and use them for playing during their leisure time.



One day, they inflated a balloon and forgot it under sunshine for some hours. As they came back, they noticed that the balloon had increased in size, and they started doubting why and who could have inflated the balloon to that size.

Task;

As a student who has studied the particle theory of matter;

- a) i. Explain to these children how the balloon became bigger in size.
- ii. Educate them on how they were able to make the balloon swell.
- b) one day, students from Ongino s.s also inflated the balloon and left it in the laboratory for a week, after which, they observed that the balloon had reduced in size, Explain to them why?

Item 4:

A student from Halcyon High School was diagnosed with constipation. When she was taken to the clinic, she was prescribed for **Magnesium sulphate** tablets to relieve her from constipation. Unfortunately, all the had a problem of absence of this tablets in their stock. She is now stuck and left in worries.



Task;

As a student of chemistry, how can you help her to come out of her problem?

Item 5:

Diamond being one of the crystalline **allotropes** of carbon has a long and dazzling history; the most interesting of all is that the early men used it to create tools for hunting. In addition to that, today diamond is a famous symbol of luxury. It is also used to make engagement rings and other jewelries.

Task;

- a) Explain the meaning of the term **allotropes**.
- b) State any other crystalline **allotropes** of carbon.
- c) Give a reason why diamond is used to make engagement rings.
- d) Why did the early men use diamond to create their tools for hunting?
- e) Draw and explain the structure of diamond.

Item 6:

Josephine went to buy paraffin and petrol from a shell. On her way back, she found two fellow students coming from school. She decided to first put the paraffin and petrol down so they can play. **Medina** the friend to **Josephine**, accidentally added paraffin to petrol. A mixture was quickly formed that was not easy to separate immediately. **Judith** and their fellow told them that she had an apparatus which can be used to separate the mixture.

Task;

- a) i. Suggest the apparatus **Judith** had that she was going to use to separate the two liquids.
ii. Give one word that represents the mixture formed.
iii. Name the process of separation of a mixture that **Judith** had thought about and give a reason to why she decided to use the process named above.
- b) i. Explain the procedure she was going to use to separate the two liquids.
ii. Give one more other example of a mixture separated by the above method.

Item 7:

Most of the complains arising from students right now is that, whenever they wash clothes, they use a lot of soap, this is making them to over make phone calls to parents for just the same item over and over again, this also has made parents to start thinking that may be teachers at times divert their children's soap. And this has left everyone thinking why and how this happens.

Task;

As a student of chemistry;

- a) Help educate the entire fraternity on the type of water those students use for washing their clothes so as to cool the situation.
- b) Explain to them how they can use less amount of soap while washing using the same type of water identified in (a) above.

Item 8:

People from Tisai sub-county always face a challenge whenever they want to cross to Kumi town because of the water body separating them. Recently, the government decided to launch a program of constructing a bridge in order to aid the movement of these people. Specific materials were being chosen to use over others.



Task;

- a) Make a write-up to your friends and community explaining to them the materials being used in the construction of the bridge, justifying the necessity of each of the material used.
- b) Explain why in our daily life metals are being over plastics to be used for making cooking materials.

Item 9:

People living in Kumi town always dispose a lot of plastic waste. However, the only solution that the Mayor thought of in order to reduce the amount of plastics is burning them.



Task;

- As a student of chemistry, write an email to the town Mayor informing him about the dangers that can result from burning plastics.
- If the town Mayor calls you to address the people around Kumi town about other ways they can manage plastics instead of them burning them, Summerise the speech you will deliver to them that day.

Item 10:

At Ocokican High School, students always face a challenge in chemistry when it comes to telling the groups, periods, atomic numbers and atomic mass of elements. You have been invited by the Head of Department Science to come and speak to their learners .

Task;

Design a chart that will guide you in your speech in order to solve their problem, use the first 30 elements.

Item 11:

One of the lakes in Uganda is known to be the source of salt that is commonly used in our homes today for cooking and other uses. The president of the republic of Uganda has therefore asked scientists to do everything possible to get common salt from this lake.



Task;

As a young chemist;

- Guide the people recruited to do this activity on the procedures taken to obtain salt from this lake.
 - Give the chemical name of common salt and write its chemical formula.

Item 12:

In an attempt to investigate what happens when a substance T is heated. S.1 students of Kanapa s.s obtained and recorded the following results of temperature changes together with time taken.

Time(mins)	0	1	2	3	4	5	6	7	8	9	10	11	12
Temperature (°C)	-10	0	0	10	20	30	40	50	60	80	80	80	90

Task;

- Suggest which laboratory apparatus these students used for obtaining temperature values.
- Plot a graph of temperature of substance **T** versus time.
- Use your graph to determine the;
 - Freezing point of substance **T**.
 - Boiling point of substance **T**.
- Draw and comment on the arrangement of particles of substance **T** at;
 - 10 °C
 - 90 °C
 - 20 °C

Item 13:

Carbon dioxide is one gas most popularly known and used in fire extinguishers.



As a young chemist of Ozone High School, you have been asked to guide newly admitted students on how to prepare the gas mentioned above from the laboratory. From your understanding you clearly know that the gas is prepared by reacting Marble chips and dilute hydrochloride acid **BUT NOT** dilute sulphuric acid.

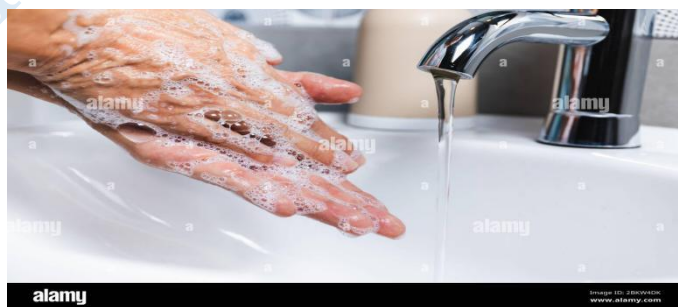
Task;

As a student of chemistry;

- write the chemical name and formula of marble chips.
- write an article you would use when guiding these students on the preparation of the gas.
- Clearly explain to these students why dilute sulphuric acid is not used in preparing the gas.
- One of the students after following your article suggested that you should first pass the gas through Potassium Hydrogen Carbonate and then to concentrated Sulphuric acid. Is this information correct? And if so, explain.

Item 14:

Residents of Ongino village are currently hit by high prices of liquid soap in the Open Market and yet its even of poor quality. Your school is most known for preparing good quality liquid soap. The parish chief has decided to invite you to educate the Youth Club from Ongino on how to prepare good quality liquid soap that can be sold to people at a cheaper price.



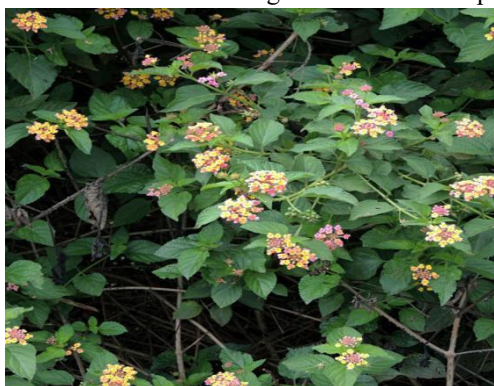
Task;

Using your knowledge of acids, bases and salts. Make a write-up that will guide you in training the youth.

Item 15:

People from your district mostly rely on the Agriculture particularly crop growing as the only source of income for their families and in most cases for the whole district at large.

Recently, in 200 acres, the crops have started drying up and the people are crying out of low crop yields. According to research, some villages in your district are experiencing rapid spread of **Lantana Camara** while other villages are faced with spread of **Lavendula Spica (Lavender)**.



Lantana camara



Lavender

The senior Agricultural Officer has been contacted and has mobilized a meeting for village representatives.

Task;

As a student of chemistry, the Agricultural officer has asked you to make a presentation to the farmers' village representatives advising them on the state of their land and how their crop yields can be improved.

Make a write-up of your presentation.