WUNNA EDUCATIONAL SERVICES

LOWER SECONDARY HOLIDAY PACKAGE

SCIENCE SUBJECTS

SCHOOL NAME:

STUDENT'S NAME:

CLASS AND STREAM:

INSTRUCTIONS:

- Complete all the exercises in this Package.
- Submit your work on the first day back after the holiday.
- Ensure all your work is neat and well-organized.
- Make Research but when answering the package ensure that you work independently to ensure that your understanding is reflected.

CHEMISTRY

Item 1

A farmer went to an agricultural shop to get advice on how to improve on the yields of his maize plants on his farm. He found two products. Labelled compost manure and Urea but lacked information about the two products.

Task

As a chemistry student;

(a) Help the farmer to;

(i) Understand the two products.

(ii) Know the need for the products.

(b) Advise the farmer on the choice of the products to use.

Item 2

Budduda communities face challenges of weak and poorly constructed bridges and they are calling up on the Government to work on the state of the bridges in their area.

The local authorities are seeking your advice on the materials to use for bridge construction

Task:

Use your chemistry knowledge to;

(a) Explain

(i) Categories of materials to use.

(ii) The suitability of the materials.

(b) Inform the local authorities on the impact of the materials used to the environment.

Item 3

One of the large scale uses of sodium hydroxide is manufacture of soap, to ensure that sodium hydroxide is easily available and at a cheaper cost, government has cleared a local investor to set up a sodium hydroxide manufacturing plant near Lake Katwe in kasese district because of the related importance of the manufacturing plant. However, the community is concerned about its environmental effects and how the manufacturing process will occur.

The school has appointed you to sensitize the community.

Task:

Prepare a presentation you will make during the meeting.

Item 4

The demand of cement and other building materials has increased in the country. In Tororo, there are many rocks that can be used to manufacture cement, this has made a local saving scheme to source funds and start up a cement manufacturing plant but lacks knowledge on how to the rock can be converted into cement ready to use with minimal environmental impact.You have been in invited .

Task:

Make a write up you will deliver to Jinja city council answering their concerns. (*11 scores*)

Item 5

There has been a nationwide destruction of natural resources due to increasing population and human activities. This has attracted the attention of officials from National Environment Management Authority (NEMA).

The officials are planning to sensitize people countrywide about natural resources conservation through organizing workshops in different districts.

Task:

As a chemistry learner, write a message you would deliver upon invitation in workshop organized in your district. (*11 scores*)

Item 6

People in Seroma village have often been found to be carrying out bush burning, over grazing and stone quarrying. They are now facing breathing problems and low soil fertility and are now wondering why this is happening.

The LC1 chairman has organized an emergency village meeting with a theme,

"ENVIRONMENT CONSERVATION, A RESPONSIBILITY FOR ALL."

Task:

As chemistry student and one of the village members, make a write up about the theme that you will present in the village meeting.
(*11 scores*)

____

____

____

____

____

____

____

____

Item 7

In one of the societies in Kampala, there is an outbreak of bacterial diseases such as typhoid. The society members rely on each other for medical advice. Recently, a resident complained about persistent stomach ache followed by diarrhoea, but there was no one to advise on proper medication the society members should use.

Task:

As a learner of chemistry;
(a) Advise society members on the possible types of products to use?
(b) Carefully educate them on what the products exactly do.
(c) Advise them on the challenges associated with the product use and consequently how to select the products to use.

Item 8

A group of Learners were faced with a unique solid substance, X, which they suspected to be an element. 0.3g of the element could burn in air to form 0.5g of the solid product. One of them picked interest in what could be the chemical formula of the oxide of the element. However, he did not know how to determine the formula.

When they contacted the laboratory technician he gave them the atomic number and mass number of X as 12 and 24 respectively, and the symbolic representation of oxygen as $^{16}_{8}O$

As a student of chemistry help the learners to; (a) understand the nature of substance X

(b) Determine the formula of the oxide of X

(c) Know the environmental consequences of the element

MATHEMATICS

Item 1

You decided to have a Joint party with your family members which will cost a total of Uganda shillings four million. You are nearing a D-Day and you want to find out whether you have enough required amount of money or not. And below are the contributions;

i. Your parents promised to contribute 30% of the money.
ii. Your friends promised 10% more than that your parents promised.
iii. And since you are the owner of the party, you contributed 20% of the required amount.

When you went for shopping, you moved 6km due East from your home and the 8km due south to reach the market, but the old man on the way told you that there is a shortest route you would use to reach the market directly to save time. And you made a booking of shillings; one million, seventy five thousand for all items required for the party.

Task

As a Mathematics learner,
(a) How far from your home to the supermarket if you used a direct route?
(b) Make a simple budget for the party according to the booking.
(c) Do you have the required amount for the party? Justify.
(d) What advice can you give to the party organizing committee?

Item 2

Ayebare's family is building a new rectangular flat house with a length of 15 meters and a width of 8 meters. They need to cover the roof with iron sheets, each measuring 2 meters by 1 meter. Two hardware shops, A and B, sell the required iron sheets at different prices.

Shop A sells each iron sheet at Shs 35,000, with a 10% discount for every 50 sheets purchased.
Shop B sells each iron sheet at Shs 40,000, with a 5% discount for every 40 sheets purchased.
Task:

As a Mathematics learner,
(a) How many iron sheets are needed to cover the entire roof of the house?
(b) Calculate the total cost of iron sheets from Shop A, including the discount.
(c) Calculate the total cost of iron sheets from Shop B, including the discount.
(d) Which shop offers the better deal, and how much can Ayebare's family save by choosing that option?

Item 3

Nakatude's family owns a small farm in the village, where they grow and sell vegetables. They want to enclose a rectangular garden with a fence. The length of the garden is 5 meters more than the width.

Task

As a Mathematics learner,

(a) What are the dimensions of the garden?

(b) If the fencing material costs Shs 500 per square meter, and they want to spend not more than Shs 50,000 on fencing, is their budget sufficient?

(c) The family makes a profit of Shs 2,000 per square meter of tomatoes sold, and they want to make a profit of at least Shs 150,000. Will they meet their target profit?

Item 4

In preparation for S4 prom party, you were chosen by your fellow candidates to be a chairperson organizing committee. You moved from school to town A which is 160km north of your school, for shopping party items. From town A you moved west wards 150km to town B. From B you headed to town C in the direction S75°W which is 90km from B. From C you continued to town D which is 148km and south of B but after you discovered that there is the shortest route you could use to move directly from school to town D.

In the shopping, you bought 400 chicken and each cost UGX 35,000. The farmer gave you a 2% discount on each chicken. You also bought two identical jerry cans of cooking oil. The larger being of height 30cm and smaller 15cm. The larger has a capacity of 10 litres. And you bought 4 smaller and 2 larger jerry cans.

Task

(a) Determine how far you would move if you used a direct route.

(b) Determine the total cost incurred in purchasing chicken.

(c) What is the maximum amount of cooking oil you bought for the party?

ITEM 5

Mukisa is a senior two student and he needs a personal revision timetable suitable for 10 subjects.

(a) Help Mukisa to make a timetable

(b) Find the total number of lessons per week in that timetable

(c) Find the total time that he will spend in class per day in

(i) Hours (ii) minutes

ITEM 6

Two learners were given a task of plotting the following points on the grid. A (0, 4) B (2, 2), C (4, 2), D (2, 0), E (4, -2), F (0, -1), G (-4, -2), H (-2, 0), I (-4, 2) and J (- 2, 2). Before they plotted the points, Jane told Musa that when plotting, for point A you move 4units to the right of the origin and no movement along the y-axis from the origin. For point C you move 2 units to the right of the origin and 4 units parallel to the y-axis in the positive direction. Musa said no for point A there is no movement along the x-axis, you only move 4 units along the y–axis. While for point C you move 4 units from the origin on the x-axis, then two units parallel to the y–axis.

a) Comment with reasons on Jane's explanation of plotting the points.
b) Using Musa's explanation, plot the coordinates.
c) Join the points to form a polygon. State the equation of the line of symmetry.

ITEM 7

Your guardian has a budget of Shs700, 000 for your school expenses. To get to the school where your guardian wishes to take you for A-level, your guardian drove 4 km east from your home to

the stage and then 8km north to reach there. However, you realized later that there was a direct route from home to school your guardian could have used.

On reaching the school, you found out that, the school fees, admission fees and uniform fees are Shs900, 000, Shs100, 000 and Shs350, 000 respectively. The school also offers a bursary of; 60% off school fees, free admission and eighty-seven thousand five hundred shillings off uniform fees to those who got first grade and according to your results, you qualify for this bursary.

It also has two payment plans on school fees that the guardians can choose from and they are: - Paying in two installments that is to say; two thirds of the school fees at the beginning of the term and the balance at either visitation day or end of term.

- Paying in three equal installments; at the beginning of the term, on visitation day and end of term respectively.

Task:

a) How far is it from your home to school if you travel through the direct route?

b) (i) Since you qualify for the bursary, how much will you pay?

(ii) Will your guardian afford the school expenses according to his budget?

c) (i) How much will those who are to pay school fees of Shs900,000, pay per installment, according to each of the payment plans?

(ii) Which payment plan would you recommend for them and why?

BIOLOGY

ITEM 1

During orientation week, the new students were told sex is prohibited at school; they were advised to abstain until marriage and if anybody is caught involved in sex related offenses, they would be expelled from School. The main reasons were; sex leads to unwanted pregnancies, poor concentration in class and above all it's the path for all STDs. You're required to cite one viral STD, identify its cause and describe its symptoms, ways of transmission and how it can be prevented. (10 scores).

ITEM 2

1. Identity the life processes that are demonstrated by the following. 4 scores

a. A boxer sweating after a match

b. a frightened boy running after seeing a fierce dog

c. a monkey seated on the Branch of a tree picking and eating fruits.

d. seedlings kept in a dark room bending towards the window

e. Explain why a racing car that consumes fuel, passes out gases and moves on wheels is not regarded to as a living thing.

ITEM 3

a) Citing three examples; explain why the body organ systems should work together. 5 scores.

b) In the space below you're required to draw 3 specialized cells; name them and state the function of each. 5 scores

4. a) Differentiate between the following.

i. Vascular and non-vascular plants. 1 score
ii. Angiosperms and Gymnosperms. 1score
iii. Monocots and Dicots 1score

b). Explain why plants can survive without animals while animals cannot survive without plants 2 scores

ITEM 4

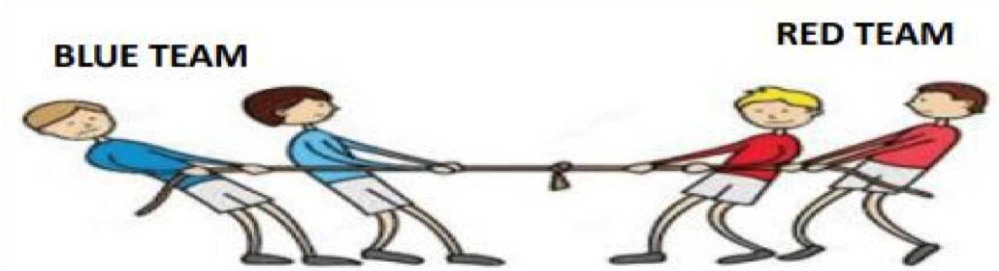
Mr. Mukasa cleared a forest along the slopes of a hill that had fertile soils to extend his farm for growing maize. After several years of planting maize on his farm, the maize plants planted started to grow slowly with yellow leaves which greatly reduced the maize yields. Yields are poorer at the hill top than in the valley. Also, residents of this village use the valley of Mr. Mukasa's farm for dumping plastic waste bottles and used polythene bags which has caused more challenges especially in the streams found in the valley.

Task
Explain the likely effects of the actions of Mr. Mukasa and the residents of his village and suggest possible ways these effects can be overcome. What is the importance of conservation of valleys?

PHYSICS

ITEM 1

You all have experienced a force in some way. Forces play a role in everything that we do. It may be kicking a ball, playing games and others. **BLUE** team and **RED** team are playing a tag of war. If each person in the blue team pulls the flag with a force of **200N** and each person in the red team pulls the flag with force of **100N**.



Task

By showing your working, which team do you think will win the game? In addition, how many people should be added to the losing team to match the strength of the winning team?

ITEM 2

There has been an outbreak of malaria in your community and your friend is admitted in hospital. You have been delivering a warm meal; however, you are required to deliver a hot meal for her in the hospital.

Explain how you would ensure that the food you have prepared remains

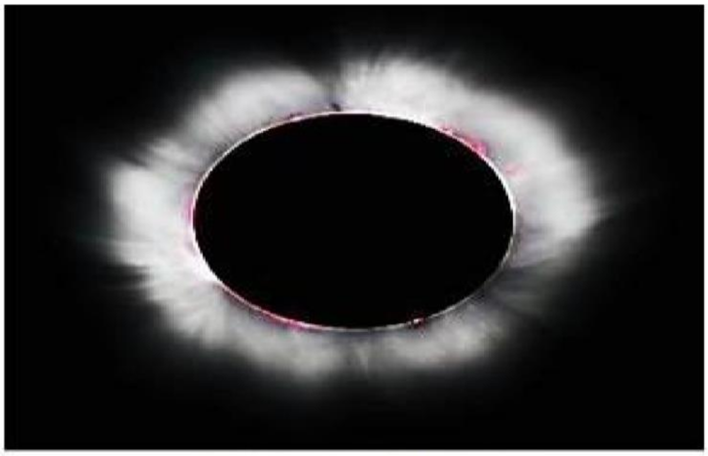
Hot until you reach the hospital?

ITEM 3

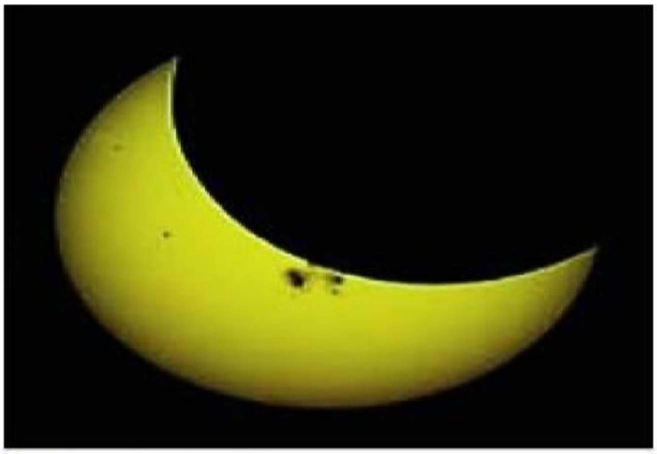
A certain family stays near the marram road and a school. Every day, the family receives dust raised by moving vehicles from the road and the bad smell from the school pit latrines. In the morning hours, the dust is not so much and the smell from the pit latrine is not so much either. These conditions worsen around midday on hot sunny days. The family is disgusted by these conditions. They do not know the cause of these conditions. As a Physics student, write a message to this family explaining what **causes** the above conditions and **possible ways** of solving the above problem.

ITEM 4

A long time ago, solar eclipses were considered as a message from the gods since the people in that age dwelt so much in the spiritual realm than the scientific world. However, with the development of science and technology, eclipses can now easily be explained scientifically instead of spiritually. Whenever eclipses occur, many people gather out in open places to watch the beautiful view of the heavenly bodies as they align themselves in a beautiful display.



(a) Total eclipse



(b)Partial eclipse

However, in most remote areas of Uganda some people still observe the eclipse directly using naked eyes not aware of the risk they are exposing their eyes to in the long run. The science club of your school has taken an initiative to always once in a while go out into the community and teach the community members about scientific facts. This year you are expected to go out during the day an eclipse is expected to occur to. You are expected to organize for the presentation about eclipses.

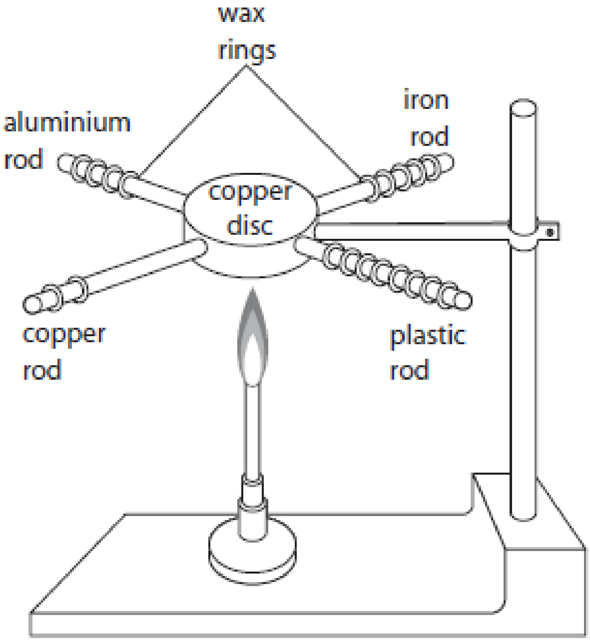
Task

As a student of physics and science club at the school, you are required to organize for the presentation about eclipses that you will use to address the community members on the day the eclipse is expected to occur. Conclude your presentation by recommending the best safe ways to watch an eclipse. (You may include ray diagram illustrations).

ITEM 5

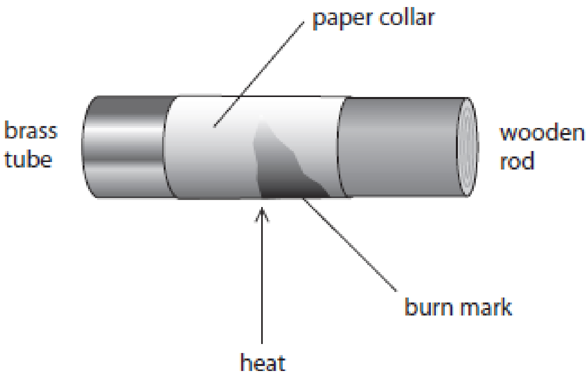
During a Physics lesson, a teacher performs three separate experiments to demonstrate conduction of thermal energy.

In the first experiment, he inserts four rods of different material into a copper disc and places 8 pieces of wax rings onto each rod. She then heats the copper disc with a Bunsen flame. The figure below shows the results of the experiment after the copper disc was heat for a few minutes.



In the second experiment, he places lumps of ice in a test tube, places a wire mesh on top of ice and fills the test tube with water. He then heats up the top of the test tube until the water boils.

In the third experiment, he inserts a wooden rod into the end of a brass tube and wraps the interface of the two materials with a paper collar which he then heats. The figure below shows the result of the experiment after a few minutes.



As a learner of Physics, help the students who did not attend the lesson that day to understand;

(a)What the first experiment tells us about conduction of thermal energy.

(b)The importance of the wire mesh and the observations made in the second experiment.

(c)Why the paper collar was burnt on the wooden rod but not on the brass tube.

ITEM 6

A war erupted between two groups of soldiers who had camped on opposite sides of a certain hilly area surrounded by small water bodies. The soldiers communicated by throwing a stone in water to alert their colleagues of any danger ahead however the stone could alert their enemies too. One of the soldiers had **small sizable plane mirrors** and a **torn paper box** in his bag. Occasionally, the leader of one group of soldiers sent spies to peep behind the hills to see where the enemy troops were hiding but they could be captured and killed. One day as it was threatening to rain, bright colours of different kind spread out in the sky. This scared the soldiers and they took off and hid in a cave which is very dark inside as the rays from the sun couldn't reach there.

As a learner of Physics,

(a) Advise the leader of the soldiers on how they could be able to see where the enemy troops are hiding without having to climb up the hill.

(b) Help the soldiers understand the cause of the bright colours that spread out in the sky.

(c) Advise the soldiers on how they would solve the problem they faced inside the cave.

ITEM 7

A mother preferred to cover her daughter using two thin blankets and one thick blanket of the same size.

Task

a) As a physics student, explain why two thin blankets are wormer than a single thick one.
b) Apart from covering her daughter with a blanket, what else can be done by another mother to keep her daughter in a worm condition and explain why it is necessary?

ITEM 8

One morning, a boy woke up and observed that the dust particles in the path of light rays through a small hole in the roof of his room moved randomly. Later in the afternoon, he saw that the dust particles moved even faster. He became curious and asked his elder brother but who failed to give him a convincing explanation. He moved round the house and was amused to see that some substances had fixed volumes and shapes, others had fixed volumes but not shapes while others had neither fixed shape nor volume. Later at night as they were watching the television, his brother told him that inside the television is a state of matter called plasma.

As a learner of Physics, help the boy understand:

(a) Why the dust particles moved randomly.

(b) Why some substances have fixed shape and volume while others have fixed shape but not volume while others have neither a fixed shape nor fixed volume.

(c) What the plasma state of matter is. Your explanations may include some examples of plasma.

ITEM 9

During a Physics lesson in a certain school, a teacher told the learners that when heat is supplied to matter, matter progressively changes from one state to another. Before explaining further, the bell for ending the lesson rung. The teacher couldn't explain how matter changes from one state to another but instead instructed the learners to make research. One of the learners approaches you for consultation. As a learner of Physics, help the student know how matter changes from one state to another. Your explanation should include the names of the changes, an illustrative diagram and the application of the different changes in states of matter.

Wunna Educational Services

Provides learning and teaching materials in soft copy through
Our E-Learning platforms below;

YouTube channels	Tiktok and Facebook Pages
➢ Wunna E-Learning platform ➢ Tr. Ivan's online class ➢ Wunna maths channel ➢ Wunna kids platform ➢ Teacher Kato Ivan Wuuna	➢ Wunna educational services ➢ Wunna kids platform ➢ Wunna art centre ➢ Tr. Ivan's online class ➢ Learn physics with wunna

We welcome both learners and teachers to our
E-learning platforms on all the social media apps.

find us on

You Tube

WES Website

wunnaeducationalservices.com