1. During a class activity, the students were tasked to find the length of their classroom. Wangwe found out that the length is **50 foot spans** while Yonah obtained **12 meters.**
2. Why do you the two obtained different values?
3. Which of the values is an estimate?
4. Who obtained the actual value?
5. How can we obtain reliability of an estimate?
6. The diagram shows the dimensions of Amos’ dinning room.

8m

400cm

3000mm

6m

2m

Amos wants to buy for his room and a roll of carpet covers 15m2. How many rolls of the carpet will he need to buy?

1. A golden coloured cube measures 2cm by 0.02m by 200mm and weighs 40g. it can be bought for $100,000 being a golden treasure. Given that the density of pure gold is 19.3gcm-3, is this material gold?
2. Baby Deo has just been gifted a balloon and he left it under sunshine. Explain what is likely to happen to the balloon and why.
3. You have been hired by a company dealing in minerals. On the wall, there is a chat as below;

|  |  |
| --- | --- |
| **SUBSTANCE** | DENSITY (gcm-3) |
| Ice | 0.90 |
| Olive oil | 0.92 |
| Water | 1.0 |
| Aluminum | 2.7 |
| Copper | 8.9 |
| Silver | 10.5 |
| Lead | 11.3 |
| gold | 19.3 |

Below are some of the minerals that have one dealer has brought to sale to the company that has employed you:

|  |  |  |
| --- | --- | --- |
| **Substance** | **Mass (g)** | **Volume (cm3)** |
| Shiny fork | 21 | 2 |
| Old metal piece | 50 | 4.42 |
| White metal | 63.72 | 23.6 |
| Brownish solid | 52.0 | 2.69 |

As a new employee, help the company identify each of the minerals bought above. (show all your workings clearly)

1. As you entered the school laboratory, you found the set-up below;

Water

Crystals of potassium permanganate

Briefly describe to your friends what is taking place

1. A box in Mbale industrial park is tied with strongs as below;

13N

7N

5N

12N 6N

1. John pushes a drum of oil of force 3000N up a tractor trailer with a force of **600N** by incline of slanting height 18m and vertical height **3m**.
2. What is the velocity ratio of the system
3. Determine the MA of the system
4. What’s the efficiency of the incline
5. Concrete is used in construction of permanent strong structures and is made by mixing gravel, sand, cement and water.
6. What are some of the mechanical properties of concrete.
7. Concrete has great compressional strength but weak tensile strength. This is solved by **reinforcing** concrete. Briefly describe reinforcing.
8. S.2 students at Success SS wish to calculate the density of a metal cube and a plastic doll which appear as below;

**Metal cube** **plastic statue**

Briefly describe how the density of each of the above can be obtained.

1. Three balls of force 2N, 5N and **X**N respectively from left rest on a pivoted meter rule of length **3m** as shown below;

0.2m

2m

Determine the value of X.

1. Zowena carries a box of mass 4.0kg and dimensions 5.0cm X 3.0cm X 2.0cm. what is the maximum and minimum pressure the box can exert on Zowena’s head.
2. At a certain school, there is a tank that is **2m** tall and has a base area of **2.5m2** which is filledwith water to the brim. Given that it exerts a force of **40,000N** on the supporting ground, determine the density of the water in the tank.
3. Sadolin Company uses tins of volume 6X10-3m3 to package paint which has a density of **25,000kgm-3.** What will be the mass of the tin when filled with Sadolin paint?
4. complete the table below;

|  |  |  |
| --- | --- | --- |
| **Quantity** | **Unit** | **Unit symbol** |
| Length |  |  |
|  | ampere | A |
|  | Newton |  |
| Time |  | S |
|  | kilogram |  |

1. Surface tension is the acting of the surface of a liquid like a thin elastic membrane. Mention three observations that prove the existence of surface tension.
2. a. Molecules attract themselves either when they are of the same kind or different kinds. Mention the forces of attraction in either case.
3. Write short notes on the following diagrams;
4. (B)
5. S.2 students set up a framework of a model bridge as below;

Y

X

Q

R

P

Which of the girders are ***ties***?

1. The figure below shows a brick wall under construction. Redraw the diagram to show the effect of a **shear force .**

1. Sam releases a ball of mass 2.0kg from a cliff 4.0m high onto a horizontal playground. Calculate the kinetic energy of the ball.
2. 2

Write about the set-up in consideration of A,B and C

A B C

1. Apese who is a p.6 pupil has been tasked to make research and write short notes on the terms; **ray**, **beam** and **magnification** . As a secondary school physics student, help Apese complete the assignment.
2. At some season of the year, people in Bufumbula village believe there is a *fight* between the **sun** and **moon** which causes darkness on **earth**. Explain to the villagers this scientific occurance.
3. A model pinhole camera made by s.1 students at NSSS forms an image as shown below.

4cm

5cm 7cm

1. Calculate the magnification of the camera
2. What would happen to the image if the pin hole was made larger?
3. S.1 students obtained the following results during an experiment of light using a mirror and pins;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***i (0)*** | 10 | 20 | 30 | 40 | 50 | 60 |
| ***r (0)*** | 11 | 22 | 30 | 41 | 50 | 61 |

1. Plot a graph of ***i*** against ***r***
2. What conclusion do you draw from the nature of the graph?
3. Light from a source may land on a smooth surface or a rough surface. With the aid of diagrams, describe what happens in each case above.
4. Dan is using an uncalibrated thermometer in an experiment whose fundamental interval is 25cm. The mercury thread goes 7cm below the upper fixed point when the thermometer is dipped in a certain mixture. What is the temperature of the mixture in kelvins?
5. Briefly describe to your parents how a vacuum flask is able to maintain a constant temperature for some time.
6. Abel who lives near a river has observed that during day, the river waters are cold while the land near the river bank is hot. The vice versa is true at night. Explain to Abel the scientific meaning of this.
7. S.1 students at Destiny High School mixed liquid Y of volume 0.40m3 and density 9000kgm-3 with liquid Z of volume 0.35m3 and density 800kgm-3. Determine the density of the mixture.
8. Johan releases a ball of mass 2kg from a wall at a height of 0.8m above a rough horizontal ground along an inclined plane as below;

Calculate the velocity of the ball at P

0.8m

**P**

1. In an experiment to verify Hooke’s law, students used a spring of natural length 5.0 X 10-2m which extends by2.0 X 10-3m when a force of 18N is applied on the other end. What would be the extension when a force of 10N is applied to the spring?
2. While experimenting with a spring, S2 students obtained the results as below;

|  |  |
| --- | --- |
| Mass (g) | Extension(cm) |
| 100 | 3 |
| 200 | 5 |
| 300 | 8 |
| 400 | 11 |
| 500 | 13 |
| 600 | 16 |
| 700 | 19 |

1. Complete the table including values of Extension (m) and Force (N)
2. Plot a suitable graph for the data.
3. Deduce the spring constant from your graph.
4. It has been observed that houses built in wetland areas often peel off their walls and appear dumpy. What advice would you give your friend Makupe who wants to build in a wetland area?
5. Nusula is asked to carry a box whose dimensions are 2cm **X 3cm X 4cm** and it weighs **40N.** Determine the minimum force per unit area it can exert on Nusula’s head.
6. A certain experiment requires you to use the mass of a meter rule in computation. Unfortunately, there is no beam balance or weighing scale at your desk. All you have is a single known mass and a knife edge. Briefly describe how you would establish the mass of the meter rule.
7. Wamunga works with National Water and Sewerage Cooperation. This time, the wish to supply water to a building at a height of **72m** from the ground. People in the building will need to use **2000kg** of water every **one hour**. How much power of the water pump do they need to achieve the need?
8. An electric motor of efficiency 90% operates a water pump and rises 0.9kg of water in 1 second through a height of 10m. Calculate the power of the pump.
9. Matooke traders from Kapchorwa are always loading trucks beyond the gazzeted cargo bars. These trucks normally get involved in accidents and sometimes loss of lives. Briefly describe how the over loading leads to an accident.
10. The surface of water or any other liquid acts like a stretched elastic membrane. Give two observations that provide evidence for this behavior.
11. Over the years, atmospheric temperatures have been increasing rapidly. Scientists have attributed this to poor environmental activities. Briefly describe how the overheating of the atmosphere occurs.
12. Water is a poor conductor of heat. Defend the statement.
13. A pencil whose length is 9cm is placed 6cm in front of pin hole camera whose screen is 15cm away from the pencil. By scale diagram, show how the image is formed and determine its height.
14. A wooden block in the physics laboratory is 0.5m long and 0.01m thick. What’s the width of the block if it has a mass of 0.45kg and density 9000kgm-3?
15. Briefly describe how hotels are able to supply warm water to the showers of their clients all the time.
16. Elkana runs up the stairs of a dormitory of 60 steps each of 12cm. if Elkana weighs 45kg, how much work does he do by the time he is upstairs?
17. Briefly describe how a tractor is able to move over a muddy ground more easly compared to a car.
18. A uniform metre rule balances when a mass of 250g is hung at its 10cm mark if pivoted at the 25cm mark. What is the weight of the metre rule?
19. You have a class presentation on the heading “Reflection of light”. Prepare a presentation not exceeding 500 words.