

# SCIENCE LABORATORY ECONOMY BUDGET FOR BEGINNERS OF JUNIOR SECONDARY SCHOOLS. 2023

## Notes

It is assumed that you have constructed a **standard Science Laboratory that can accommodate [20 – 40 students] during a lesson.** It should also have furniture, gas and water taps fitted.

According to Grade 7 curriculum designs for integrated science, the three branches of science have all been included, i.e. Chemistry, Biology and Physics.

Going by the content therein, the school management would come up with a breakdown and therefore identify what is initially most needed for the science lab in the first year going forward.

This will NOT only save you unnecessary costs but also procure what is best suitable for the learners.

It is also important to note that from the designs, most of the learning is in groups and therefore you do NOT need to buy a lot of things for individual learners.

We have captured some sections of the designs as well as budget proposals that can save you money.

## A; GRADE 7 INTEGRATED SCIENCE CURRICULLUM DESIGNS

### 1.0 Scientific Investigation [ALL THE SCIENCES- GENERAL PRINCIPLES]

#### 1.10 Introduction to Integrated Science

#### GRADE 7 INTEGRATED SCIENCE CURRICULLUM DESIGNS

| Strand                       | Sub-Strand                             | Specific Learning Outcomes/ <i>Objectives</i>                                                                                                                                                                                                                                                            | Suggested Learning Experiences/ <i>Activities</i>                                                                                                                                                                                                                                                                                              | Suitable Learning resources/ <i>Apparatus</i><br>(For a class/lab of 20-40 students)<br><i>N.B for double this number, the reagents will double in quantities</i>                                                                             |
|------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.0 Scientific Investigation | 1.1 Introduction to Integrated Science | By the end of the sub-strand the learner should be able to:<br>a) Identify the components of Integrated Science as a field of study.<br>b) <i>Relate knowledge and skills gained in Integrated Science to career opportunities.</i><br>c) Appreciate the importance of Integrated Science in daily life. | The learner is guided to:<br>• discuss the meaning and components of Integrated Science with peers.<br>• discuss in a group, career opportunities related to knowledge and skills gained in Integrated Science.<br>• identify pathways related to Integrated Science at Senior school.<br>• Search for information on importance of Integrated | <i>Charts</i> on components of Integrated Science as a field of study - 1<br><br>• Watching video tapes on components of Integrated Science as a field of study<br><br>Laptop, modem, Projector and 4-port extension cable.<br><br>(Internet) |

## 1.20 Laboratory Safety

|  |                              |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                              |
|--|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>1.2 Laboratory Safety</b> | a) identify common hazards and their symbols in the laboratory<br>b) <u>analyse</u> causes of common accidents in the laboratory<br>c) Demonstrate first aid safety measures for common laboratory accidents.<br>d) Appreciate the importance of safety in the and access to a healthy working environment. | <ul style="list-style-type: none"> <li>• identify common hazards and accidents in the laboratory</li> <li>• interpret common hazard symbols, including but not limited to flammable, corrosive, toxic, carcinogenic, radioactive substances among others</li> <li>• discuss in groups, causes of common laboratory accidents and related first aid measures (burns and scalds, cuts, and</li> </ul> | (flammable, corrosive, toxic, carcinogenic, radioactive)<br><br><b>Chart</b> on causes of common laboratory accidents and related first aid measures (burns - burner and scalds, cuts, and ingestion of harmful substances)<br><br><ul style="list-style-type: none"> <li>• First Aid Kit</li> </ul> <b>posters and slogans</b> on first aid |
|--|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 1.30 Basic Science Skills

|  |                                  |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                |
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|  | <b>1.3. Basic Science skills</b> | a) Identify basic skills in science.<br>b) <u>use</u> the International System of Units (SI) for basic and derived quantities in science.<br>c) appreciate the application of Basic skills in science | <ul style="list-style-type: none"> <li>• identify basic skills in science (manipulative, observation, measurement, classification, <u>prediction</u>, communication and conclusion skills).</li> <li>• <u>brainstorm</u> on the importance of reading packing labels on quantities/products.</li> <li>• apply the International System of Units (SI) to</li> </ul> | <b>Chart</b> of basic skills in science.<br><br><ul style="list-style-type: none"> <li>• <b>Chart</b> of International System of Units (SI) for basic and derived quantities in science.</li> <li>• <b>Internet</b></li> </ul> |
|--|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 1.40 Basic Science Skills

|  |                                                 |                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                     |
|--|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>1.4 Laboratory apparatus and instruments</b> | a) Identify apparatus and instruments used in the laboratory.<br>b) Handle and care for the apparatus and instruments in laboratory.<br>c) appreciate the importance of consumer protection when | science skills from the internet.<br><br><ul style="list-style-type: none"> <li>• identify apparatus and instruments in the laboratory (for heating, measuring mass, temperature, length, <b>volume</b>, weight, magnification and time) (include parts and functions of a microscope and</li> </ul> | Microscope – 2<br>Glass slides (with specimen) 5pcs<br>Hand lenses - 10<br>Beam balance – 1<br>Electronic weigh balance – 1<br>Spring balances – 10 |
|--|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

## 2.0 Mixtures, Elements and Compounds [CHEMISTRY]

### 2.10 Mixtures

|                                             |                     |                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                       |
|---------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2.0 Mixtures, Elements and Compounds</b> | <b>2.1 Mixtures</b> | a) classify different types of mixtures as homogeneous or heterogeneous<br>b) distinguish between pure and impure substances using melting and boiling points<br>c) separate mixtures using different methods<br>d) appreciate the use of different methods of separating mixtures in | <ul style="list-style-type: none"> <li>• categorize different <u>mixures</u> as homogeneous (uniform) and heterogeneous (non-uniform); (solid- solid, solid- liquid, liquid- liquid and gas- gas mixtures).</li> <li>• carry out, in groups, simple experiments to determine the <i>boiling</i> and <i>melting</i> points of pure and impure substances (ice, candle wax, water, salty</li> </ul> | Tripod stand – 10<br>Wire gauze – 10<br>Round bottomed flask (250) -5<br>Flat bottomed flask (250) -5<br>Rubber corks (flasks) - 8<br>Glass tube – 1m<br>Delivery tube – 4pcs<br>Rubber tube – 2m<br>Liebig's' condenser – 2<br>Separating funnel – 1 |
|---------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 2.20 Acids, bases and indicators

|  |                                        |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                        |
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|  | <b>2.2 Acids, bases and indicators</b> | a) use <u>plant extracts</u> as acid-base indicator<br>b) <u>categorize</u> different house-hold solutions as either acidic or basic using indicators.<br>c) determine the strength of acids and bases using universal indicator<br>d) outline applications of acids, | <ul style="list-style-type: none"> <li>Prepare and use plant extract indicator to classify common house hold solutions as either acidic or basic, in a group.</li> <li>classify different house-hold solutions as either acidic or basic using indicators (use methyl orange, litmus or</li> </ul> | Motor and pestle – 10<br>Droppers – 10<br>Test tubes - 60<br>Test tube rack - 10<br>Test tube brush - 10<br>Boiling tubes – 20<br>Boiling tube brush – 5<br>Beakers (glass, 1000ml)- 1 |
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## 2.30. Solid – Liquid Mixture separation (Water Purification).

|  |                                                                                     |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                         |                                                        |
|--|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|  | <b>2.3. Solid – Liquid Mixture separation (Water Purification).<br/>CSL Project</b> | a) identify nearby sources of water in the community<br>b) categorize water from different sources into clean and dirty water<br>c) identify appropriate materials for separating clean water from solid in the dirty water<br>d) make homemade water filter | <ul style="list-style-type: none"> <li>visit the nearby rivers or other sources of water to collect samples of different waters</li> <li>identify and use appropriate locally available materials to make homemade water filter that can be sued to separate</li> </ul> | <b>Charts</b> on procedures to prevent water pollution |
|--|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|

## 3.0 Living Things and their Environment [BIOLOGY]

### 3.10 Reproduction in human beings

|                                                |                                         |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                     |                                                                     |
|------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>3.0 Living Things and their Environment</b> | <b>3.1 Reproduction in human beings</b> | a) describe the menstrual cycle in human beings<br>b) describe challenges related to the menstrual cycle<br>c) Describe the process of fertilization and implantation.<br>d) Appreciate the existence of sex- | clean water from the source<br><ul style="list-style-type: none"> <li>discuss human menstrual cycle</li> <li>discuss various challenges related to the menstrual cycle</li> <li>use <u>illustrations,charts</u> and <u>digital devices to observe animations showing</u></li> </ul> | <b>Charts</b> of reproduction in humans<br><b>Model</b> of a pelvis |
|------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|

### 3.20 Human Excretory System-Skin and Kidneys

|  |                                                    |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                            |                                                                                                                      |
|--|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|  | <b>3.2 Human Excretory System-Skin and Kidneys</b> | a) Identify the external parts of the human skin and their functions.<br>b) Identify the external parts of the kidney and their functions.<br>c) describe causes of kidney disorders<br>d) Adont a healthy lifestyle to | Learners are guided to:<br><ul style="list-style-type: none"> <li>use a chart/model, in groups to brainstorm on the external parts and functions of human skin (<u>cover,hair</u>, sweat glands and epidermis –<u>avoid</u> <u>homeostatic functions of the</u></li> </ul> | Chart of a skin – 1<br>Model of skin - 1<br>Chart of a Kidney – 1<br>Model of kidney - 1<br><b>Making own models</b> |
|--|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|

## 4.0 Force and Energy [PHYSICS]

### 4.10 Static Electricity

|                             |                               |                                                                                                                                                                       |                                                                                                                                                                                                                                                                 |                                                                                                      |
|-----------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>4.0 Force and Energy</b> | <b>4.1 Static Electricity</b> | a) demonstrate the existence of static charges in objects<br>b) charge objects using different methods<br>c) demonstrate the effects of force between charged objects | <b>system.</b><br><ul style="list-style-type: none"> <li>rub different objects to show the presence of static charges in objects</li> <li>charge different objects by <u>rubbing</u> and <u>induction</u></li> <li><u>search for, play and watch</u></li> </ul> | Perspex rods – 10<br>Glass rods – 10<br>Rubber balloons – 1pkt<br>Cotton wool – 1roll<br>Silk – 1/4m |
|-----------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|

## 4.20 Electrical Energy

|  |                              |                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                |                                                                                                                                                                                         |
|--|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>4.2 Electrical Energy</b> | a) identify various sources of electricity in their environment<br>b) set up simple electrical circuits in series and parallel using dry cells, bulbs, ammeters and voltmeters<br>c) classify materials as conductors and non-conductors of electricity<br>d) identify electrical appliances in | • discuss and identify sources of electricity (hydro-electric power, geothermal, solar, wind power)<br>• search for and observe videos and photographs on sources of electricity<br>• Set up simple electrical | Chart for series and parallel arrangement of both bulbs and cells<br><br>Dry cells – 20pairs<br>Cell holders (Plastic-2cell) – 10<br>Cell holders (Plastic-1cell) - 20<br>bulbs - 20pcs |
|--|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 4.30 Magnetism

|  |                      |                                                                                                          |                                                                                                                                            |                                                                                    |
|--|----------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  | <b>4.3 Magnetism</b> | a) classify materials in the environment as magnetic or non-magnetic<br>b) investigate the force between | their environment<br>• identify and collect materials within their environment, sort and group them as magnetic and non-magnetic materials | Copper foil – 10<br>Aluminum foil – 1roll<br>Zinc strips – 10<br>Steel pins – 1pkt |
|--|----------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|

## B; SUGGESTED BUDGET

### 1.0 Apparatus [Strategic]

| NEW LABORATORY BUDGET BEGINNING WITH GRADE 7 INTEGRATED SCIENCE REQUIREMENTS |                           |                  |               |                     |        |               |                |
|------------------------------------------------------------------------------|---------------------------|------------------|---------------|---------------------|--------|---------------|----------------|
| #                                                                            | Apparatus/Reagent         | Description/type | Capacity/size | Substrand category  | Amount | @KES          | TOTAL          |
| 1                                                                            | First Aid Kit             | Laboratory       | Medium        | <b>ments</b>        | 1Set   | 3,500         | 3,500          |
| 2                                                                            | Microscope                | Student          | std           |                     | 2pcs   | 12,000        | 24,000         |
| 3                                                                            | Glass slides              | Prepared         | std           |                     | 5pcs   | 200           | 1,000          |
| 4                                                                            | Hand lenses               | Plastic Handle   | std           |                     | 10pcs  | 150           | 1,500          |
| 5                                                                            | Weigh balance             | Mechanical       | 110g (0.01g)  |                     | 1 pc   | 14,000        | 14,000         |
| 6                                                                            | Weigh balance             | Electronic       | 0.01g - 300g  |                     | 1 pc   | 24,000        | 24,000         |
| 7                                                                            | Spring balances           | N/g Scale        | 100g          |                     | 5pcs   | 300           | 1,500          |
| 91                                                                           | Magnetic plotting compass | Steel casing     | 50mm          |                     | 2pcs   | 250           | 500            |
| 92                                                                           | Crucible                  | With lid         | 50ml          |                     | 5pcs   | 220           | 1,100          |
| 93                                                                           | Scarpel Handle            |                  |               |                     | 2pcs   | 120           | 240            |
|                                                                              |                           |                  |               | <b>Sub -Total 1</b> |        | <b>88,205</b> | <b>244,530</b> |

### 2.0 Reagents [Strategic]

| REAGENTS |                          |                  |           |                                    |      |     |     |
|----------|--------------------------|------------------|-----------|------------------------------------|------|-----|-----|
| 1        | Candles                  |                  |           | <b>Mixtures</b>                    | 1pkt | 180 | 180 |
| 2        | Plastinecine wax         |                  |           |                                    | 500g | 200 | 200 |
| 3        | Bee wax                  |                  |           |                                    | 500g | 700 | 700 |
| 4        | Kerosene                 |                  |           |                                    | 5lit |     |     |
| 5        | Sodium chloride          | Crystalline Salt |           |                                    | 500g | 450 | 450 |
| 6        | Calcium hydroxide        | Crystalline Salt |           |                                    | 500g | 550 | 550 |
| 15       | Hydrochloric acid        | Conc             | 1.18/ 36% | <b>Acids, bases and indicators</b> | 1lit | 600 | 600 |
| 16       | Sulphuric acid           | Conc             |           |                                    | 1lit | 810 | 810 |
| 17       | Sodium hydroxide         | pellets          |           |                                    | 500g | 850 | 850 |
| 18       | Phenolphthalein solution | Conc             |           |                                    | 1lit | 450 | 450 |
| 19       | Citric acid              | Monohydrate      |           |                                    | 500g | 600 | 600 |
| 20       | Magnesium hydroxide      | Crystals         |           |                                    | 250g | 800 | 800 |
| 21       | Acetone                  | LP               |           |                                    | 1lit | 950 | 950 |

|    |                           |          |       |           |                     |               |               |
|----|---------------------------|----------|-------|-----------|---------------------|---------------|---------------|
| 21 | Acetone                   | LP       |       | <b>Ac</b> | 1lit                | 950           | 950           |
| 22 | methyl orange             | Solution |       |           | 500ml               | 330           | 330           |
| 23 | phenolphthalein Indicator | Solution |       |           | 500ml               | 500           | 500           |
| 24 | Distilled water           |          | 20lit |           | 40lit               | 300           | 600           |
|    |                           |          |       |           | <b>Sub -Total 2</b> | <b>18,620</b> | <b>21,820</b> |

### 3.0 Models, Charts & Videos (CD) **[Important]**

|    |                                                                   |  |  |             |             |       |       |
|----|-------------------------------------------------------------------|--|--|-------------|-------------|-------|-------|
| 3  | Model of kidney                                                   |  |  | system      | 1pc         | 1200  | 1200  |
|    |                                                                   |  |  |             | Sub Total 4 | 3,600 | 3,600 |
| 8  | Chart of a skin                                                   |  |  |             | 1pc         | 500   | 500   |
| 9  | Chart of a Kidney                                                 |  |  |             | 1pc         | 500   | 500   |
|    | Chart for series and parallel                                     |  |  |             |             |       |       |
| 10 | arrangement of both bulbs and cells                               |  |  |             | 1pc         | 500   | 500   |
|    |                                                                   |  |  | Sub Total 3 |             | 5,000 | 5,000 |
|    |                                                                   |  |  |             |             |       |       |
| 6  | Video on Colours of acid- base indicators in different solutions. |  |  |             |             |       |       |
| 7  | Video on Fertilization and implantation                           |  |  |             |             |       |       |
|    |                                                                   |  |  | Sub Total 5 |             | 2,500 | 2,500 |

### 4.0 Other Essentials **[Important]**

|    |                   |                    |        |  |                    |               |               |
|----|-------------------|--------------------|--------|--|--------------------|---------------|---------------|
| 9  | Lab coat          | White              | Medium |  | 4pc                | 1,000         | 4,000         |
| 10 | Wash bottle       | Plastic            | 250ml  |  | 10pcs              | 150           | 1,500         |
| 11 | Labels            |                    | medium |  | 4pkts              | 50            | 200           |
| 12 | Fire Extinguisher | Dry Carbon dioxide | 4.5 kg |  | 1pc                | 7,500         | 7,500         |
|    |                   |                    |        |  | <b>Sub Total 6</b> | <b>10,230</b> | <b>16,050</b> |

### 5.0 ICT Integration (Optional)/ICT Guide for Tutors **[Optional]**

|   |                 |            |  |  |                    |                |                |
|---|-----------------|------------|--|--|--------------------|----------------|----------------|
| 3 | Internet modem  | Universal  |  |  | 1pc                | 6,500          | 6,500          |
| 4 | Extention cable | 4-port, 3M |  |  | 1pc                | 1,200          | 1,200          |
|   |                 |            |  |  | <b>Sub Total 7</b> | <b>107,700</b> | <b>107,700</b> |

### 6.0 Laboratory Procedures manual (grade 7) **[Optional]**

The Lab manual serves as a guide on the best practices in handling the laboratory apparatus and chemicals. It also give alternatives to improvise and replace whatever could be lacking in the lab, like using of wood ash in place of a base, tumbler for a beaker and so forth.....

*The above information is bits to serve as an advert. If interested, we can share the information with you and if need be we supply you with the above items at best prices and quality ever.*

*You will be adding laboratory apparatus annually as we gradually move into transitional levels, or with the school growth. All the above will be needed in Grade 8 too, in addition to a few more.*

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