**Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Guidelines**

**&**

**Support Documents**

2012

**LIFE SCIENCES**

**Gr. 10**

** Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Teacher Assessment File**

**Grade 10**

Name of Teacher:

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Name of the School:

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(Name of the District:

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201…..

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**Contents:**

* + - **Program of Assessment (9 Tasks):**
		- **Consolidation Form:**
		- **Schedules:**
			* **Subject Mark Schedule**
		- **Moderation:**
			* **School Based Tool**
			* **District Tool**
		- **Formal SBA Tasks:**

 **(Task, Marking Tool, Analysis Grid)**

* + - * **Research Project/ Assignment**
			* **Practical Tasks**

**Hands-on Practical 1**

**Hands-on Practical 2**

**Hypothesis Testing Practical**

* + - * **Class Test**

**Test 1**

**Test 2**

**Test 3**

**Test 4**

* + - * **Examinations**

**Midyear (June)**

 **Paper 1**

**(Life at Molecular, Cellular and Tissue Level & Life Processes in Plants and Animals)**

|  |
| --- |
| **PROGRAMME OF FORMAL ASSESSMENT** |
| **Formal, Recorded, School-Based Assessment (25%)** | **End-of-Year Internal Examinations (75%)** |
| Content | Practical | 2 Written Examinations2½ hours, 150 marks each | Practical Examination1 hour |
| * 4 Tests (minimum of 50 marks each)
* 1 midyear examination (2½ hours, 150 marks)
* 1 project/ assignment (can be done in any term: 100 marks in the 4 term
* Skills are listed under Specific Aims 1 and 3
 | A selection of 3 representative practical tasks, which **cover the range of skills**, must be marked and recorded. (The marks allocated for a practical task should range from 20 to 40).Range of skills described under Specific Aim 2 | Content, concepts, skills across all topics. Knowledge of practical work as well as some of the skills related to practical work must be assessed in the written examination**80% = 60 marks** | Practical knowledge and skills**20% = 15 marks** |
| 25 | 75 |
| **SCHOOL-BASED ASSESSMENT (during the year)** |  |
| TERM 1 | TERM 2 | TERM 3 | TERM 4 |
| * 1 Test
* 1 Practical
 | * 1 Test
* 1 Practical
* Midyear Examination
 | * 1 Test
* 1 Practical

(Environmental Studies Fieldwork) | * 1 Test
* 1Project/ Assignment
 |
| 25% | 25% | 25% | 25% |
| Converted to 25% | 75% |

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|  **EASTERN CAPE DEPARTMENT OF EDUCATION** **………………………………………………….. Name of Teacher**  **Grade 10**. **LIFE SCIENCES PROGRAMME OF ASSESSMENT** **SUBJECT TEACHER CONSOLIDATION FORM** |
| **ASSESSMENT Task** | **KNOWLEDGE AREA COVERED/ TOPICS** | **ASSESSMENT TOOL** |
| **Research Project/ Assignment** |  |  |
|  |  |  |
| **Practical Tasks** |  |  |
| * **Hands-on practical 1**
 |  |  |
| * **Hands-on practical 2**
 |  |  |
| * **Hypothesis testing**
 |  |  |
|  |  |  |
| **Class Tests** |  |  |
| * **Test 1**
 |  |  |
| * **Test 2**
 |  |  |
| * **Test 3**
 |  |  |
| * **Test 4**
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|  |  |  |
| **June Examination** |  |  |
|  |  |  |

 **MODERATION PANEL**

|  |  |  |  |
| --- | --- | --- | --- |
|  **DESIGNATION** |  **NAME IN PRINT** |  **SIGNATURE** |  **DATE**  |
| **Head of Department / Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |

**Province of the LIFE SCIENCES Gr. 10 201….**

School stamp

**EASTERN CAPE**

**EDUCATION**

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| School |  | Principal |  |
| Teacher |  | HOD |  |

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|  |   **PROGRAMME OF ASSESSMENT RECORDING SHEET:**  |
|   |   | Term1    | Term2    | Term3   | Term 4   | SBA  A  | Final Examination | BExam | CPrac | A+B+CFINALMARK |
| No | Surname, Init | Prac | Test | Conv Mark | Prac | Test | June Exam | Conv Mark | Prac  | Test | Conv Mark | Proj/Assig | Test | Conv Mark |  TotT1-4 | Conv Mark | Mod Mark |  P1 |  P2 | PracExam | Mark | Exam |
|   |   | 30 | 70 | 25 | 30 | 70 | 150 | 25 | 30 | 70 | 25 | 100 | 70 | 25 | 100 | 25 | 25 | 150 | 150 | 60 | 60 | 15 | 100 |
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**MODERATION PANEL**

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| **DESIGNATION** | **NAME IN PRINT** | **SIGNATURE** | **DATE** |
| **Head of Department** |  |  |  |
| **Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |
| **National/ UMALUSI** |  |  |  |

**Work schedule & Pacesetter for Grade 10 Life Sciences: 2012 (as per CAPS document dated June 2011)**

**TERM ONE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Planned Date****(Week ending)** | Reference page in CapsDocument | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)** |
|  |  | **Task and number required per term** |
| 13/01 | **20, 21** | **LIFE AT MOLECULAR, CELLULAR AND TISSUE LEVEL** | Orientation to Life Sciences | * How Science works
 | 2 hours1/2 week |  | **1 FORMAL RECORDED PRACTICAL (30)****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **1 FORMAL RECORDED CLASS TEST : 1 HOUR = 70 MARKS** |
| * Scientific skills
 |  |
| * Organization of learning and rules
 |  |
| 20/01 | **22, 23** | Chemistry of life | * Molecules for life
 | 10 hours2 1/2 weeks) |  |
| 27/01 | * Inorganic compounds
 |  |
|  | * Organic compounds
 |  |
|  | * Nucleic acids and vitamins
 |  |
| 03/02 | **24** | Cells: The basic unit of life | * Molecular make-up
 | 12 hours ( 3 weeks) |  |
|  | * History of microscopy
 |  |
| 10/02 | * Cell structure and function: roles of organelles
 |  |
|  | * Relate structure and location of organelles to their function
 |  |
| 17/02 | * Cell structure and function (specialization)
 |  |
|  | * Differences between plant and animal cells
 |  |
| **Planned Date****(Week ending)** | Reference page in CapsDocument | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)** |
| **Task and number required per term** |
| 24/02 | **25** | **LIFE AT MOLECULAR, CELLULAR AND TISSUE LEVEL** | Cell division - mitosis | * Cell cycle and difference in telophase between animal and plant cell
 | 8 hours (2 weeks) |  | **1 FORMAL RECORDED PRACTICAL (30)****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **1 FORMAL RECORDED CLASS TEST : 1 HOUR = 70 MARKS** |
|  | * Chromosomes
 |  |
| 02/03 | * Role of mitosis
 |  |
|  | * Cancer
 |  |
| 09/03 | **25** | Plant and animal tissues/ | * Introduce concept of tissue
 | 4 hours ( 1 week) |  |
| 16/03 | * Emphasis on relationship between basic structure and function
 |  |
|  | * Plant tissues: xylem, phloem, parenchyma, collenchyma, schlerenchyma, epidermis and meristematic tissues
 |  |
| 23/03 | REVISION & TEST |

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| **TERM ONE HOLIDAY: 24 MARCH TO 09 APRIL 2012**  |

**TERM TWO**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Planned Date****(Week ending)** | **Reference page in Caps****Document** | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)** |
| **Item and number required per term** |
| 13/04 | **27** | **Life at molecular, cellular and tissue level** | Plant and animal tissue (continue from term one) | Animal tissues:* Epithelial
 | 8 hours ( 2 weeks) |  | **1 FORMAL RECORDED PRACTICAL (30)****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **1 FORMAL RECORDED CLASS TEST (1 HOUR = 70 MARKS****MID-YEAR EXAMINATION (2 HOURS 30 MINUTES) = 150 MARKS** |
| * Connective
 |  |
| * Muscle
 |  |
| 20/04 | * Nerve
 |  |
| * Relationship between structure and function
 |  |
| * Application of indigenous knowledge systems and biotechnology
 |  |
| 27/04 | **27, 28** | Organs | * Introduce the concept “organ”
 | **2 hours (1/2 week)** |  |
| * Leaf structure as an example of an organ
 |  |
| * Cross section of a dicotyledonous leaf to demonstrate and explain its structure in terms of its functions i.e. photosynthesis, gaseous exchange and transport
 |  |
| * Link the leaf’s structure and functions with plant tissues, appropriate cell organelles, movement across membranes and movement of molecules into, through and out of leaf.
 |  |
| **Planned Date****(Week ending)** | **Reference page in Caps****Document** | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)** |
| **Item and number required per term** |
| **04/05** | **28, 29** | **Life processes in plants and animals** | Support and transport systems in plants | * Anatomy of dicotyledonous plants:
* Structure of cells in different tissues
 | **12 hours ( 3 weeks)** |  | **1 FORMAL RECORDED PRACTICAL (30)****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **1 FORMAL RECORDED CLASS TEST (1 HOUR = 70 MARKS****MID-YEAR EXAMINATION (2 HOURS 30 MINUTES) = 150 MARKS** |
| * Roots and stems: distribution of different tissues
 |  |
| * Secondary growth; annual rings in a tree trunk to assess age and to infer climate change
 |  |
| **11/05** | * Transpiration:
* Relationship between water loss and leaf structure (*link to term 1)*
 |  |
| * Factors that affect the rate of transpiration: temperature, light intensity, wind, humidity
 |  |
| **18/05** | * Wilting and guttation
 |  |
| * Uptake of water and minerals into xylem in roots
 |  |
| * Transport of water and minerals to leaves
 |  |
| * Translocation of manufactured food from leaves to other parts of plants
 |  |
| **Planned Date****(Week ending)** | **Reference page in Caps****Document** | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)**  |
| **Item and number required per term** |
| 25/05 | **29,30** | **Life processes in plants and animals** | Support systems in animals | * Skeletons: Examples of animals with each of the following:
* Hydrostatic skeleton
 | 12 hours ( 3 weeks) |  |  |  |
| * Endoskeleton
 |  |
| * Exoskeleton
 |  |
| Advantages and disadvantagesEmphasize developmental progression and relate to the need for support linked to a terrestrial lifestyle |  |
| 01/06 | * Human skeleton:
* Axial and appendicular skeleton
 |  |
| * Functions of the skeleton
 |  |
| * Structure of a long bone
 |  |
| * Relationship between structure and function of the following tissues:
* Bone. Cartilage, tendons, ligaments
 |  |
| 08/06 | * Joints
 |  |
| * Roles of: bones, joints, ligaments, tendons and antagonistic muscles
 |  |
| * Structure of voluntary skeletal muscle: myofibrils and muscle contraction
 |  |
| * Diseases that affect the skeleton: e.g. rickets in children, osteoporosis, arthritis
 |  |
| 15/0622/06 | **REVISION & MID-YEAR EXAMINATION** |
| **TERM 2 HOLIDAY: 23 JUNE – 15 JULY 2012** |

**TERM THREE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Planned Date****(Week ending)** | **Reference page in Caps Document** | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)** |
| **Task and number required per term** |
| 20/07 | **32, 33** | **Life processes in plants and animals** | Transport system in mammals(humans) | * Blood circulatory system – pulmonary and systemic
 | 12 hours ( 3 weeks) |  | **1 FORMAL RECORDED PRACTICAL (30)****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **I FORMALLY RECORDED CLASS TEST (I HOUR = 70 MARKS)** |
| * Heart and blood vessels, internal structure
 |  |
| * Cardiac cycle
 |  |
| 27/07 | * Direction of blood flow and difference between oxygenated and deoxygenated blood in different parts of the system (Diagram)
* Lungs and pulmonary system; associated blood vessels
 |  |
| * Major organs and systemic system; associated major blood vessels of brain, small intestine, liver, kidneys
 |  |
| * Control of cardiac cycle and heart rate(pulse)
 |  |
| 03/08 | * Blood vessels: structure and functioning of arteries, veins with valves and capillaries
 |  |
| * Lymph:
* Relationship between blood system and lymphatic system
 |  |
| * Functions of lymphatic system
 |  |
| * Diseases of heart and circulatory system
 |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Planned Date****(Week ending)** | **Reference page in Caps Document** | **Strand** | **Topic** | **Content** | **No. of teaching hours** | **Completion Date** **(Week ending )** | **Programme of Assessment****(Formal tasks)** |
| **Task and number required per term** |
| 10/08 | **33,34,****35** |  | Biosphere to Ecosystems/Revision | * Biosphere
* Biomes
 | **24 hours ( 6 weeks)** |  | **1 FORMAL RECORDED PRACTICAL (30)****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **I FORMALLY RECORDED CLASS TEST (I HOUR = 70 MARKS)** |
| 17/08 |  | * Environment
* Ecosystems
 |  |
| 24/08 |  | * Abiotic factors
* Biotic factors
 |  |
| 31/08 |  | * Energy flow
* Trophic levels
 |  |
| 07/09 |  | * Nutrient cycles: water, oxygen, carbon and nitrogen cycle
 |  |
| 14/09 |  | * e**c**otourism
 |  |
| 21/0928/09 | **TESTS** |
| **TERM THREE HOLIDAY: 29 SEPTEMBER TO 07 OCTOBER 2012** |

**TERM FOUR**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Planned Date****(Week ending)** | **Reference page in Caps Document** | **Strand** | **Topic** | **Content** | No. of teaching hours | Completion Date  | **Programme of Assessment****(Formal tasks)** |
| **Task and number required per term** |
| 12/10 | **36,37** | **Biodiversity, change and continuity** | Bi*o*diversity and classification | * Extent of biodiversity and endemism in Southern Africa: indigenous and endemic species
 | 4 hours (1week) |  | **1 RESEARCH PROJECT/ ASSIGNMENT = 100 MARKS****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | * **1 CLASS TEST (1HOUR = 70)**
* **Nov exam P 1 & P 2**

**150 marks each*** **Nov Practical**

**Exam = 60 marks** |
| * Classification schemes:
* Brief history – five- kingdom system
 |  |
| * Naming things in science: species concept and binomial system (Linnaeus)
 |  |
| * Differences between prokaryotes and eukaryotes
 |  |
| * Characteristic features of:

Bacteria, Protests, Fungi, Plants, Animals |  |
| **Planned Date****(Week ending)** | **Reference page in Caps Document** | **Strand** | **Topic** | **Content** |  |  | **Programme of Assessment****(Formal tasks)** |
|  |  | **Task and number required per term** |
| 19/10 | **37,38, 39** | **Biodiversity , change and continuity** | History of Life on Earth/Revision | * Life’s history
* Geological time scale – three eras with periods: Paleozoic, Mesozoic an Cenozoic; meaning and use of time scales
* Cambrian explosion
 | 20 hours ( 5 weeks) |  | **1 RESEARCH PROJECT/ ASSIGNMENT = 100 MARKS****TOPIC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | * **1 CLASS TEST (1HOUR = 70)**
* **Nov exam P 1 & P 2**

**150 marks each*** **Nov Practical**

**Exam = 60 marks** |
| 26/10 | * Changes in species occurring in Africa over the last four million years (e.g. humans)
 |  |
| 02/11 | * Mass extinctions
* Fossil formation and methods of dating
 |  |
| 09/11 | * Southern African evidence of key events in life’s history
 |  |
| 16/11 | * The impact of humans on biodiversity and the natural environment
* Fossil tourism
 |  |
| 23/1130/1107/12 | **EXAMINATIONS** |
| **TERM FOUR HOLIDAYS: ( 8 DECEMBER TO 15 JANUARY)**  |

**Province of the**

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**GRADE 10 PRACTICAL TASK 1 TERM 1**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**TIME: 1 Hour MARKS = 30**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**BACKGROUND INFORMATION**:

**ENZYMES AS BIOCATALYSTS**

**Catalysts** – substances which accelerate the rate of chemical reactions without being used up in the reaction.

**Enzymes** – protein molecules which catalyse chemical reactions (biocatalysts).

**Catalase** – an enzyme which breaks down the poisonous substance hydrogen peroxide, H2O2, (which is formed in both plants and animals) to water and oxygen.

**CATALASE**

Catalase occurs in the cells of many living organisms. Hydrogen peroxide is a substance which is produced as a result of normal metabolic processes in healthy living cells. It is toxic to living cells if it is allowed to accumulate in the tissues of living organisms. Catalase acts on the substrate hydrogen peroxide and converts it into water and oxygen as follows:

 2H2O2  2H2O + O2

Catalase is responsible for speeding up this important reaction which would otherwise be too slow to support life. Catalase is found in cell organelles called peroxisomes. One molecule of catalase can convert 6 million molecules of hydrogen peroxide to water and oxygen each minute. The rate at which the enzymes works is influenced by several factors such as concentration of the substrate (hydrogen peroxide), temperature, pH and the presence of inhibitors or activators. Each different enzyme has an optimal range for each of these factors at which the enzyme activity is at its maximum. Temperatures in excess of 400C to 500C will denature (destroy) the catalase enzyme and make it useless. Boiling an enzyme would therefore denature it completely.

**TESTING FOR THE PRESENCE OF OXYGEN**

The simple test involves plunging a glowing piece of wood (called a splint) into a test tube. If the gas in the test tube contains oxygen, the splint will relight and burn with a bright flame.

**INSTRUCTIONS : Do the experiment as a group or individually, BUT the worksheet must be completed individually for assessment.**

Before you begin your investigation, make sure that you have all of the following items at your workstation:

* 100 ml hydrogen peroxide. (Available from most Pharmacies)
* small piece of fresh liver
* teaspoon dried yeast
* cutting tile or plastic lid
* scalpel or sharp knife
* ruler
* identical test tubes in a test tube rack
* forceps
* permanent marker
* test tube holder
* wooden splint
* measuring cylinder
* matches
* timing device

You must also have access to the following:

* bunsen burner/ matches

**Method**

1 Label three test tubes A, B and C using your permanent marker.

2 Carefully measure out 5ml of hydrogen peroxide into each of the three test tubes labelled A, B and C.

3 Cut a small piece of liver about 1cm3 in size.

4 Measure an equivalent quantity of dried yeast and place it next to the piece of liver you have just cut on the lid / tile.

5 **FOR REASONS OF SAFETY CALL YOUR TEACHER BEFORE YOU CARRY ON WITH ANYTHING ELSE**.

6 Add the piece of liver to Test Tube A using your forceps and immediately afterwards add the dried yeast to Test Tube B.

7 Make sure that these two solids drop to the bottom of the tubes.

8 Leave for three minutes exactly.

9 Measure the height of the foam in each tube using your ruler and record in the table below.

10 While the foam is forming in each tube, test the gas produced using a glowing splint.

**Observation:**

**Table 1:**

Describe exactly what you saw happening in each test tube and record in the table provided. Also interpret the effect on the glowing splint, and record.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Tube A**  | **Tube B**  | **Tube C** |
| **Observation**  |  |  |  |
| **Effect on glowing splint**  |  |  |  |
| **Interpretation of effect on glowing splint** |  |  |  |

 (9)

Table 2: Complete the table.

|  |  |
| --- | --- |
| **Test tube**  | **Amount of foam produced (mm)**  |
| **A**  |  |
| **B**  |  |
| **C** |  |

 (3)

3. Write the suitable heading for the above **table 2.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4. Draw a suitable bar graph in the space below to show the amount of foam produced for each of the three test tubes.. (6)

5. What is the function of the test tube labelled C and why was it needed? (2)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Explain why foam is produced in test tubes A and B. (2)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Draw a conclusion from the results that you illustrated in the graph in question 4?

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8. Identify the independent variable in this experiment?

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9. Identify the dependent variable in this experiment?

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10. Name any fixed variable in this experiment and explain how it was controlled.

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 **TOTAL = 30**

**MARKING GUIDE FOR THE PRACTICAL**

1. One mark per correct response per block in Table 1 (9)

2. One mark per correct response per block in Table 2 (3)

**Questions**:

3. Heading: The amount of foam produced from hydrogen peroxide with liver or yeast cells. $√√$ (2)

4. THE RUBRIC FOR THE GRAPH (6)

|  |  |
| --- | --- |
| CATEGORY/ ASPECT | MARKS |
| Caption | 1 |
| Labelling of X and Y- axis | 1 + 1 |
| Units on Y- axis | 1 |
| Correct scale | 1 + 1 |

5. It is a control, $\sqrt{}$

 used to verify the correctness of results in the experimental apparatus $√$ (2)

6. Foam indicates a gas is produced in the reaction. $\sqrt{}$

 This gas is oxygen. $√$ (2)

7. There is more catalase in liver $√$ than in yeast. $√$ (2)

8. The type of cells/ tissue used. $ √$ (1)

9. The amount of foam produced from hydrogen peroxide. $√$ (1)

10. The amount of tissue used. Equal quantities of liver and yeast were used. $√\sqrt{}$

 The amount of hydrogen peroxide used. In all test tubes, 5ml was used. $√√$

 The temperature. All test tubes were at room temperature. $√√$ Any 1 x 2

 **TOTAL = 30**

**Province of the**

 **EASTERN CAPE**

 **EDUCATION** ****

**GRADE 10 PRACTICAL TASK 2 TERM 2**

**OSMOSIS IN PLANTS**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* **AIM:** To investigate the direction of osmosis in a potato when placed in water and sugar solution.
* **MATERIALS**: Water, Sugar, 3 potatoes, Sharp knife, 4 identical glass containers(e.g. bottles, beakers, jars, glasses) covers for the containers(e.g. foil, saucers,)paper towel and food scale.

**HYPOTHESIS STATEMENT:**

1. **Formulate your hypothesis. (2)**

**Group learners into 4 and each learner to do each container.**

**METHOD:**

1. Pour 100 ml of water (half a cup) into each container and label the container 1 to 4.
2. Add the following:
* 1 teaspoon of sugar to container 2
* 2 teaspoon of sugar to container 3
* 4 teaspoon of sugar to container 4
1. Do the following as quickly as possible:
* Peel the potatoes
* Cut them into blocks(approximately 1x1x3cm in size)
* Weigh the blocks using food scale.
* Feel the firmness of the potato blocks at the beginning of the experiment (0 hours).
* Put three blocks into each container and cover immediately.
1. Remove and blot each potato block.
2. Feel the firmness of each potato block by touching it lightly (whether it is hard or soft).
3. Weigh each potato block.
4. Repeat steps 4, 5 and 6 at two different measuring intervals (e.g. 1 hour and 2 hours).
5. Use the table below to record your results:

**RESULTS:**

|  |
| --- |
|  Change in firmness and weight of the potato blocks |
|  |  0 hour | 1 hour | 2 hours |
|  | Firmness | Weight | Firmness | Weight | firmness | Weight |
| Container 1 |  |  |  |  |  |  |
| Container 2 |  |  |  |  |  |  |
| Container 3 |  |  |  |  |  |  |
| Container 4 |  |  |  |  |  |  |

1. Draw a bar graph to illustrate the results. (10)

 **conclusion:**

State whether your hypothesis is true or false. (2)

**QUESTIONS:**

1. Name the processes that occurred in each of the four containers. (4)
2. What will happen to the potato block in container 1 and container 4 if the experiment continues for 24 hours? (4)
3. State 1 dependent and 1 independent variable and give a reason for your answer (3)
4. Would it have made a difference if we used salt instead of sugar in the investigation? (1)
5. Identify the hypertonic or hypotonic solutions between containers 2 and 4. (2)
6. When does osmosis takes place in plants? (2)

**Total = 30**

**ASSESSMENT TOOL**

Hypothesis formulated. (2)

Conclusion stated (2)

**RUBRIC**

|  |  |
| --- | --- |
| ASSESSMENT CRITERIA |  PERFORMANCE INDICATORS |
|  0 | 1 | 2 | COMMENT |
| Statement of the hypothesis | Not stated | Partially stated | Clearly stated |
| What is your conclusion | Not stated | Partially stated | Clearly stated |  |

**MARKING GUIDELINE for the BAR GRAPH**

|  |  |
| --- | --- |
|  Heading  | **1** |
| Correct type of graph(Bar) | **1** |
| Correct scale for x and y axis | **1 + 1** |
| Correct labels for x and y axis | **1 + 1** |
| All 12 columns drawn correctly | **4** |
| 9-11 columns drawn correctly | 3 |
|  5-8 columns drawn correctly | 2 |
| 1-4 columns drawn correctly | 1 |
| TOTAL | **10 marks** |

**QUESTIONS**

1. Container 1- Endosmosis(High water potential)$ √$

Container 2- Endosmosis (Low water potential)$ √$

Container 3- Exosmosis$√$

 Container 4- Exosmosis (potato block become flaccid)$ √$ (4)

1. Container 1- absorb more water $√$ and become firmer/ Turgid $√$

Container 4- Loses a lot of water $√$ and becomes flaccid / plasmolysed $√$ (4)

1. Independent Variable- - Time(See rubric for marks)$ $ $√$

Dependent Variables - Weight (See rubric for marks) $√$

The Time can be manipulated/ changed by the experimenter or

Weight is dependent on the duration or exposure of the experimental time $√$ (3)

1. No the results will be the same. $√$ (1)
2. Container 2- Hypotonic $√$

Container 4- Hypertonic $√$ (2)

1. During absorption of water by roots$√√$

OR

During movement of water from cell to cell$√√$

 OR

During the movement of water in and out of guard cell.$ √√$ (2)

 Total mark = 30

**Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Learner’s File**

**Formal Assessment Tasks**

**Grade 10**

Name of Learner:

……………………………………………………………………………………………………………………..

Name of the School:

……………………………………………………………………………………………………………………..

(Name of the District:

……………………………………………………………………………………………………………………..

201…..

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**Contents:**

* + - **Program of Assessment (9 Tasks)**
		- **Consolidation form**
		- **Declaration form**
		- **Formal Assessment Tasks:**
			* **Research Project/ Assignment**
			* **Practical Tasks**

**Hands-on Practical 1**

**Hands-on Practical 2**

**Hypothesis Testing Practical**

* + - * **Controlled Test**

**Test 1**

**Test 2**

**Test 3**

**Test 4**

* + - * **Examinations**

**Midyear (June)**

 **Paper 1**

**(Life at Molecular, Cellular and Tissue Level & Life Processes in Plants and Animals)**

|  |
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| **PROGRAMME OF FORMAL ASSESSMENT** |
| **Formal, Recorded, School-Based Assessment (25%)** | **End-of-Year Internal Examinations (75%)** |
| Content | Practical | 2 Written Examinations2½ hours, 150 marks each | Practical Examination1 hour 100 marks |
| * 4 Tests (minimum of 50 marks each)
* 1 midyear examination (2½ hours, 150 marks)
* 1 project/ assignment (can be done in any term: 100 marks in the 4 term
* Skills are listed under Specific Aims 1 and 3
 | A selection of 3 representative practical tasks, which **cover the range of skills**, must be marked and recorded. (The marks allocated for a practical task should range from 20 to 40).Range of skills described under Specific Aim 2 | Content, concepts, skills across all topics. Knowledge of practical work as well as some of the skills related to practical work must be assessed in the written examination**80% = 60 marks** | Practical knowledge and skills**20% = 15 marks** |
| 25 | 75 |
| **SCHOOL-BASED ASSESSMENT (during the year)** |  |
| TERM 1 | TERM 2 | TERM 3 | TERM 4 |
| * 1 Test
* 1 Practical
 | * 1 Test
* 1 Practical
* Midyear Examination
 | * 1 Test
* 1 Practical

(Environmental Studies Fieldwork) | * 1 Test
* 1Project/ Assignment
 |
| 25% | 25% | 25% | 25% |
| Converted to 25% | 75% |

|  |
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| **EASTERN CAPE DEPARTMENT OF EDUCATION** **……………………………………………… DISTRICT**  **Grade 10**  **LIFE SCIENCES LEARNER SBA Recording Sheet** |
| **NAME OF LEARNER:** |  |
| **SCHOOL:**  |  | **CENTRE NO:** |
| **NAME OF TEACHER:** |  |
| **Assessment Task** | **Minimum mark** | **Marks obtained** | **Programme of****Assessment maximum %** | **Converted** **mark** |
| **Term 1** |  |  |  |  |
| **Practical**  | 30 |  |  |
| **Controlled Test**  | 70 |  |  |
| **Total Term 1 = 100** | **25%** |  |
|  |
| **Term 2** |  |  |  |  |
| **Practical**  | 30 |  |
| **Controlled Test**  | 70 |  |
| **June/Mid-year Exam** | 150 |  |
| **Total Term 2 = 250** | **25%** |  |
|  |
| **Term 3** |  |  |  |  |
| **Practical**  | **30** |  |
| **Controlled Test**  | 70 |  |
| **Total Term 3 = 100** | **25%** |  |
|  |
| **Term 4** |  |  |  |  |
| **Project/Assignment** | 100 |  |
| **Controlled Test**  | **70** |  |
| **Total Term 4 = 170** | **25%** |  |
| **Total marks for Programme of Assessment** | **100%** |  |

**MODERATION PANEL**

|  |  |  |  |
| --- | --- | --- | --- |
|  **DESIGNATION** |  **NAME IN PRINT** |  **SIGNATURE** |  **DATE** |
| **Head of Department** |  |  |  |
| **Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |
| **National/ UMALUSI**  |  |  |  |

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 **DECLARATION FORM**

**Surname & Name/s of learner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Examination number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name of school: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Centre Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Declaration by Learner**

**I hereby declare that the work contained in this portfolio is my own original work.**

**Signature of learner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Declaration by teacher:**

**As far as I am able to ascertain, the work in this portfolio is the original work of this candidate. All required work has been included in the portfolio.**

**Signature of Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**LIFE SCIENCES**

**Gr. 11**

 ** Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Teacher Assessment File**

**Grade 11**

Name of Teacher:

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Name of the School:

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(Name of the District:

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**Contents:**

* + - **Program of Assessment (6 Tasks)**
		- **Consolidation Form**
		- **Schedules**
			* **Subject Mark Schedule**
		- **Moderation**
			* **School Based Tool**
			* **District Tool**
		- **Formal SBA Tasks:**

**(Task, Marking Tool, Analysis Grid)**

* + - * **Project**
			* **Practical Tasks**

**Hands-on Practical**

**Hypothesis Testing Practical**

* + - * **Controlled Test**

**Test 1**

**Test 2**

* + - * **Examinations**

**Midyear (June)**

 **Paper 1**

**(Life Processes and Environmental Studies)**

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| **PROGRAMME OF ASSESSMENT** |
| **ASSESSMENT TASKS (SBA)** | **End-of-year examination** |
| Percentage allocated | 25% | 75% |
| Forms of assessment | Practical tasks1 & 2(1st & 3rd term) | Research Project(2nd term) | Controlled tests 1 & 2(1st & 3rd term) | Midyear/June examination | November Examinations |
| Number of pieces | 2 | 1 | 2 | 1 | 1 (2 question papers) |
| Marks | 25 | 25 | 20 | 10 | 10 | 10 |  |
| **Sub totals** | **100** | **300** |
| **Grand Total** | **400** |

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|  **EASTERN CAPE DEPARTMENT OF EDUCATION** **………………………………………………….. Name of Teacher**  **Grade 11**. **LIFE SCIENCES PROGRAMME OF ASSESSMENT** **SUBJECT TEACHER CONSOLIDATION FORM** |
| **ASSESSMENT Task** | **KNOWLEDGE AREA COVERED/ TOPICS** | **ASSESSMENT TOOL** |
| **Project** |  |  |
|  |  |  |
| **Practical Tasks** |  |  |
| * **Hands-on practical**
 |  |  |
| * **Hypothesis testing Practical**
 |  |  |
|  |  |  |
| **Controlled Tests** |  |  |
| * **Test 1**
 |  |  |
| * **Test 2**
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| **June Examination** |  |  |
|  |  |  |

 **MODERATION PANEL**

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|  **DESIGNATION** |  **NAME IN PRINT** |  **SIGNATURE** |  **DATE**  |
| **Head of Department / Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official/ UMALUSI** |  |  |  |

**Province of the LIFE SCIENCES Gr. 11 201….**

School stamp

**EASTERN CAPE**

**EDUCATION**

|  |  |  |  |
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| School |  | Principal |  |
| Teacher |  | HOD |  |

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| **PROGRAMME OF ASSESSMENT RECORDING SHEET: GRADE 11** |
| **ASSESSMENT TASKS** | **RESEARCH PROJECT** | **PRACTICALS** | **CONTROLLED TESTS** | **EXAMINATIONS** |  |
| **LEARNERS** | **Project** | **Conv Project Mark** | Practical Hands-on | Hypothesis Testing  | Conv. Practical Hands-on | Conv. Hypothesis Testing  | **PRACTICAL MARK** | Test 1 | Test 2 | Conv. Test 1 | Conv. Test 2 | **CONTROLLED TEST MARK** | June Mid-Year Exams  | Con June Mid-Year Exams  |  SBA \CASS Mark | MODERATED CASS Mark | Nov Exam PAPER 1  | Nov Exam PAPER 2 | Nov Exam PAPER 1 & 2 | TOTAL MARK (SBA + Nov) | FINAL MARK |  |
|  | **80** | **20** | **50** | **50** | **25** | **25** | **50** | **100** | **100** | **10** | **10** | **20** | **150** | **10** | **100** | **100** | **150** | **150** | **300** | **400** | **100** |  |
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**MODERATION PANEL**

|  |  |  |  |
| --- | --- | --- | --- |
| **DESIGNATION** | **NAME IN PRINT** | **SIGNATURE** | **DATE** |
| **HOD** |  |  |  |
| **Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |
| **National/ UMALUSI** |  |  |  |

**Work schedule & Pacesetter for Grade 11 Life Sciences: 2012**

|  |  |  |  |
| --- | --- | --- | --- |
| **Planned Date****(week ending)** | **Completion Date****(week ending)** |  *Topic for the*  *week* | Programme of Assessment |
| **Item and Number required** |
|  2 Practicals 1 Project | 2 Controlled TestsJune Examinations |
| **TERM 1** |
|  13 Jan |  | Introduction to micro-organisms | Practical : (50 marks converted to 25)Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Controlled test: (100 marks converted to 10) |
|  20 Jan |  | Viruses/Bacteria |
|  29 Jan |  | Viruses/Bacteria |
|  03 Febr  |  | Bacteria |
|  10 Febr  |  | Protists |
|  17 Febr  |  |  Fungi**Topic for the week** |
|  24 Febr  |  | Immunity |
|  02 Mrch  |  | Support in Plants |
|  09 Mrch  |  | Support in Plants/ Revision |
|  16 Mrch  |  | *Controlled Tests*/ Revision |
|  23 Mrch  |  | *Controlled Tests* |
| Term 1 Holidays: 24 March – 09 April |
| **TERM 2** |
|  13 Apr  |  | Transport in Plants | Practical : (50 marks converted to 25)Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | June Examination (150 marks converted to 10) |
|  20 Apr  |  | Transport in Plants |
|  27 Apr  |  | Support in Animals |
|  04 May  |  | Support in Animals |
|  11 May  |  | Transport in Animals |
|  18 May  |  | Transport in Animals |
|  25 May  |  | Excretion |
|  01 June  |  |  Excretion |
|  08 June  |  |  Excretion/ Revision |
|  15 June  |  | *June Exam* |
|  22 June  |  | *June Exam* |
| Term 2 Holidays: 23 June – 15 July |
| **TERM 3** |
|  20 July  |  | Introduction into Diversity | Project (80 marks converted to 20) Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Controlled test: (100 marks converted to 10) |
|  27 July  |  | Plant diversity |
|  03 Aug  |  | Plant diversity |
|  10 Aug  |  | Plant diversity |
|  17 Aug  |  | Animal Diversity |
|  24 Aug  |  |  Animal Diversity |
|  31 Aug  |  |  Animal Diversity |
|  07 Sept  |  | Modification of Body Plans |
|  14 Sept  |  | Biogeography/Revision |
|  21 Sept  |  | *Tests* |
|  28 Sept  |  | *Tests* |
| Term 3 Holidays: 29 Sept – 11 Oct |
| **TERM 4** |
|  12 Oct  |  |  Environmental Studies |  | Nov (Final) Examination (2 \* 150 marks converted to 10) |
|  19 Oct  |  |  Environmental Studies |
|  26 Oct  |  |  Environmental Studies |
|  02 Nov  |  |  Environmental Studies |
|  09 Nov  |  |  Revision |
|  16 Nov  |  |  *Examinations* |
|  23 Nov  |  |  *Examinations* |
|  30 Nov  |  |  *Examinations* |
|  07 Dec  |  |  *Examinations* |
| Term 4 Holidays: 08 Dec – 15 Jan |

** Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Learner’s File**

**Formal Assessment Tasks**

**Grade 11**

Name of Learner:

……………………………………………………………………………………………………………………..

Name of the School:

……………………………………………………………………………………………………………………..

(Name of the District:

……………………………………………………………………………………………………………………..

201….

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**Contents:**

* + - **Program of Assessment (6 Tasks)**
		- **Consolidation Form**
		- **Declaration Form**
		- **Formal Assessment Tasks:**
			* **Project**
			* **Practical Tasks**

**Hands-on Practical**

**Hypothesis Testing Practical**

* + - * **Controlled Test**

**Test 1**

**Test 2**

* + - * **Examinations**

**Midyear (June)**

 **Paper 1**

**(Life Processes and Environmental Studies)**

|  |
| --- |
| **PROGRAMME OF ASSESSMENT** |
| **ASSESSMENT TASKS (CASS)** | **End-of-year examination** |
| Percentage allocated | 25% | 75% |
| Forms of assessment | Practical task1 & 2(1st & 3rd terms) | Research Project(2nd term) | Controlled tests 1& 2(1st & 3rd term) | Midyear/June examination | November Examinations |
| Number of pieces | 2 | 1 | 2 | 1 | 1 (2 question papers) |
| Marks | 25 | 25 | 20 | 10 | 10 | 10 |  |
| **Sub totals** | **100** | **300** |
| **Grand Total** | **400** |

|  |
| --- |
|  **EASTERN CAPE DEPARTMENT OF EDUCATION** **……………………………………………… DISTRICT**  **Grade 11**  **LIFE SCIENCES LEARNER SBA Recording Sheet** |
| **NAME OF LEARNER** |  | **EXAMINATION NUMBER** |  |
| **SCHOOL**  |  | **CENTRE NUMBER** |  |
| **NAME OF TEACHER** |  |
| **Assessment Task** | **Minimum mark** | **Marks obtained** | **Programme of****Assessment maximum mark** | **Converted** **Mark** |
| **Project** | **80** |  |  20  |  |
| **Total Project** |  |
|  |
| **Practical Tasks** |  |  |  |  |
| Hands-on practical | **50** |  |  25 |  |
| Hypothesis Testing Practical | **50** |  |  25 |  |
| **Total practical Tasks** |  |
|  |
| **Controlled Tests:** |  |  |  |  |
| Test 1 | **100** |  |  10 |  |
| Test 2  | **100** |  |  10 |  |
| **Total Controlled tests** |  |  |
|  |
| **June/Midyear Exam** | **150** |  |  10 |  |
| **Total June Examination** |  |
|  |
| **Total marks for Programme of Assessment** | **100** |  |

 **MODERATION PANEL**

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|  **DESIGNATION** |  **NAME IN PRINT** |  **SIGNATURE** |  **DATE** |
| **Head of Department** |  |  |  |
| **Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |
| **National/ UMALUSI** |  |  |  |

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 **DECLARATION FORM**

**Surname & Name/s of learner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Examination number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name of school: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Centre Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Declaration by Learner**

**I hereby declare that the work contained in this portfolio is my own original work.**

**Signature of learner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Declaration by teacher:**

**As far as I am able to ascertain, the work in this portfolio is the original work of this candidate. All required work has been included in the portfolio.**

**Signature of Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**LIFE SCIENCES**

**Gr. 12**

** Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Teacher Assessment File**

**Grade 12**

Name of Teacher:

……………………………………………………………………………………………………………………..

Name of the School:

……………………………………………………………………………………………………………………..

(Name of the District:

……………………………………………………………………………………………………………………..

201….

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**Contents:**

* + - **Program of Assessment (7 Tasks)**
		- **Consolidation Form**
		- **Schedules**
			* **Subject Mark Schedule**
			* **Copy of Computerized Mark Sheet**
		- **Moderation**
			* **School Based Tool (Pre/ Post)**
			* **District / Cluster Tool**
			* **Provincial Tool**
		- **Formal SBA Tasks:**

**(Task, Marking Tool, Analysis Grid)**

* + - * **Assignment**
			* **Practical Tasks:**

**Hands-on Practical**

**Hypothesis Testing Practical**

* + - * **Controlled Tests:**

**Test 1**

**Test 2**

* + - * **Examinations**

**Midyear (June)**

 **Paper 1:**

**(Life at Molecular, Cellular and Tissue Level & Diversity, Change and Continuity)**

 **Paper 2:**

 **(Life Processes in Plants & Animals)**

* + - * **Trial (September)**

 **Paper 1:**

**(Life at Molecular, Cellular and Tissue Level & Diversity, Change and Continuity)**

 **Paper 2:**

**(Life Processes in Plants & Animals and Environmental Studies)**

|  |
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| **PROGRAMME OF ASSESSMENT** |
| **ASSESSMENT TASKS (CASS)** |  | **End-of-year examination** |
| **Percentage allocated** | 25% |  | 75% |
| **Forms of assessment** | Practical task1 & 2 | Assignment | Controlled tests 1 & 2 | Midyear/June Examination | Trial Examination | November Examinations |
| **Term** | 1st & 2rd terms | 1st term | 1st & 3rd term | 2nd term | 3rd term | 4th term |
| **Number of pieces** | 2 | 1 | 2 | 2 question papers | 2 question papers | 2 question papers |
| **Converted****Marks** | 20 | 20 | 20 | 10 | 10 | 10 | 10 |  |
| **Sub totals** | **100** | **300** |
| **Grand Total** | **400** |

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|  **EASTERN CAPE DEPARTMENT OF EDUCATION**  **………………………………………………….. Name of Teacher**  **Grade 12**. **LIFE SCIENCES PROGRAMME OF ASSESSMENT** **SUBJECT TEACHER CONSOLIDATION FORM** |
| **ASSESSMENT Task** | **KNOWLEDGE AREA COVERED/ TOPICS** | **ASSESSMENT TOOL** |
| **Assignment**  |  |  |
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| **Practical Tasks** |  |  |
| * **Hands-on Practical**
 |  |  |
| * **Hypothesis testing Practical**
 |  |  |
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| **Controlled Tests** |  |  |
| * **Test 1**
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| * **Test 2**
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| **June Examination** |  |  |
| * **Paper 1**
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| * **Paper 2**
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| **Trial (September) Examination** |  |  |
| * **Paper 1**
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| * **Paper 2**
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 **MODERATION PANEL**

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|  **DESIGNATION** |  **NAME IN PRINT** |  **SIGNATURE** |  **DATE**  |
| **Head of Department / Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official/ Umalusi** |  |  |  |

**Province of the LIFE SCIENCES Gr. 12 201…..**

School stamp

**EASTERN CAPE**

**EDUCATION**

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| **PROGRAMME OF ASSESSMENT RECORDING SHEET: GRADE 12** |
| **ASSESSMENT TASKS** | **Assignment** | **PRACTICALS** | **CONTROLLED TESTS** | **EXAMINATIONS** |  |
| **LEARNERS** | **Assignment** | **Conv. ASSIGNMENT MARK** | Practical Hands-on | Hypothesis Testing  | Conv. Practical Hands-on | Conv. Hypothesis Testing  | **PRACTICAL MARK** | Controlled Test 1 | Controlled Test 2 | Conv. Controlled Test 1 | Conv. Controlled Test 2 | **CONTROLLED TEST MARK** | June Mid-Year Exams P1 | June Mid-Year Exams P2 | June Exams P1 & P2 | Conv. June Mid-Year Exams | Trial Exam PAPER 1  | Trial Exam PAPER 2 | Trial Exam PAPER 1 & 2 | **Conv. TRIAL EXAMINATION** |  Total SBA/ CASS Mark | MODERATED SBA / CASS Mark |
|  | **60** | **20** | **50** | **50** | **20** | **20** | **40** | **100** | **100** | **10** | **10** | **20** | **150** | **80** | **230** | **10** | **150** | **150** | **300** | **10** | **100** | 100 |
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**MODERATION PANEL**

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| **DESIGNATION** | **NAME IN PRINT** | **SIGNATURE** | **DATE** |
| **Head of Department** |  |  |  |
| **Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |
| **National/ UMALUSI** |  |  |  |

**Work schedule & Pacesetter for Grade 12 Life Sciences: 2012**

|  |  |  |  |
| --- | --- | --- | --- |
| **Planned Date****(week ending)** | **Completion Date****(week ending)** |  *Topic for the*  *week* | Programme of Assessment |
| **Item and Number required** |
|  2 Practicals 1 Assignment | 2 Controlled TestsJune/ Trial Examinations |
| **TERM 1** |
|  13 Jan |  | DNA structure, replication | Assignment: (60 marks converted to 20)Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Practical : (50 marks converted to 20)Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Controlled test: (100 marks converted to 10) |
|  20 Jan |  | RNA, protein synthesis, mutation |
|  29 Jan |  | Meiosis |
|  03 Febr  |  | Genetics |
|  10 Febr  |  | Genetics |
|  17 Febr  |  |  Genetics**Topic for the week** |
|  24 Febr  |  | Evolution: origins |
|  02 Mrch  |  | Evolution: natural selection and speciation |
|  09 Mrch  |  | Evolution: evidence |
|  16 Mrch  |  | *Controlled Tests* |
|  23 Mrch  |  | *Controlled Tests* |
| Term 1 Holidays: 24 March – 09 April |
| **TERM 2** |
|  13 Apr  |  | Evolution: human evolution | Practical : (50 marks converted to 20)Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | June Examination (230 arks converted to 10) |
|  20 Apr  |  | Evolution: evolution in present times/alternative explanations |
|  27 Apr  |  | Plant/Animal responses to the environment |
|  04 May  |  | Human nervous system |
|  11 May  |  | Nerves, reflex arc |
|  18 May  |  | Eye |
|  25 May  |  | Ear |
|  01 June  |  | Human endocrine system/Homeostasis and Temperature Regulation |
|  08 June  |  | Revision |
|  15 June  |  | *June Exam* |
|  22 June  |  | *June Exam* |
| Term 2 Holidays: 23 June – 15 July |
| **TERM 3** |
|  20 July  |  | Sexual and asexual reproduction/Life cycle of plants and insects | Controlled test: (100 marks converted to 10) | Sept (Trial) Examination (2 \* 150 marks converted to 10) |
|  27 July  |  | Reproduction in flowers/importance of seeds/reproductive strategies |
|  03 Aug  |  | Human reproduction |
|  10 Aug  |  | Human reproduction |
|  17 Aug  |  | Population ecology: size of population |
|  24 Aug  |  | Population ecology: trends in human population/social organisation |
|  31 Aug  |  | Community structure/Community change over time |
|  07 Sept  |  | Revision |
|  14 Sept  |  | *Preparatory Exam* |
|  21 Sept  |  | *Preparatory Exam* |
|  28 Sept  |  | *Preparatory Exam* |
| Term 3 Holidays: 29 Sept – 11 Oct |
| **TERM 4** |
|  12 Oct  |  | Revision |  | Nov (Final) Examination |
|  19 Oct  |  | Revision |
|  26 Oct  |  | Revision |
|  02 Nov  |  | *Final Exam* |
|  09 Nov  |  | *Final Exam* |
|  16 Nov  |  | *Final Exam* |
|  23 Nov  |  | *Final Exam* |
|  30 Nov  |  | *Final Exam* |
|  07 Dec  |  | *Final Exam* |
| Term 4 Holidays: 08 Dec – 15 Jan |

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**EDUCATION**

Grade 12 Hands-On Practical: **EXTRACTING DNA**

Manipulating Variables Marks: 50

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Group Members: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(INSTRUCTION : Do the experiment as a group or individually, BUT the worksheet must be completed individually for assessment.)**

**Experiment 1:**

**Aim:** To Extract DNA from raw wheat germ.

**Materials:**

raw wheat germ 2 plastic droppers 10 ml syringe

green washing up liquid stirring rod spatula

methylene blue 2 boiling tubes 1 card with graph paper

ice cold ethanol thermometer stopwatch

2 beakers (hot and cold water) 5 ml measuring spoon measuring cylinder

**Method:**

1. Use the measuring spoon to put 5 ml of raw wheat germ into the boiling tube.
2. Adjust the temperature in the beaker of hot water to 50-60 ºC using the cold water.
3. Use the syringe to add 22.5ml of hot water to the wheat germ in the glass jar.
4. Stir non-stop with the stirring rod for 3 minutes.
5. Add 1 ml green washing up liquid using the plastic dropper.
6. Mix gently with the stirring rod every 30 seconds for 3 minutes.
7. Tilt the boiling tube. Using the measuring cylinder slowly add 15 ml ice cold ethanol down the side of the jar. Note what happens and describe it below.
8. Using a clean dropper add 2 drops of methylene blue. Describe what happens.
9. Remove the DNA with the spatula and spread it in one of the blocks on the card to dry.

**Results:**

 **QUESTION 1 – MAKING OBSERVATIONS**

1.1 Describe what you observed in the boiling tube when you added the ethanol and then the methylene blue. (1)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1.2 Describe what the DNA on the card looks like. (1)

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1.3 Draw a fully labelled diagram of DNA indicating all the components. (4)

**Experiment 2: CHANGING of VARIABLES**

**A variable is something that can affect or change the results of an experiment.**

**Manipulating the Variables – can DNA still be extracted?**

 Each group will now repeat the experiment but change **ONE** variable.

 Each group will change a **different** variable.

* Group A: Add 1 ml of shampoo (instead of adding 1ml green washing up liquid.)
* Group B: Add 22.5ml cold water (instead of hot water).
* Group C: Use 5 ml cold ethanol (instead of 15 ml).
* Group D: Use onions instead of wheat germ
* Group E: Add food colouring instead of methylene blue.

Now estimate how much DNA you extracted compared with the first experiment. (Give a percentage against that found in the first amount. (eg. if you only got half the amount = 50%.)

 Write your results in the table below and then on the writing board.

Table showing effects of changing variables on the extraction of DNA

|  |  |  |  |
| --- | --- | --- | --- |
| **Changed Variable**  | **Observations** | **Was DNA extracted?** | **Estimated %** |
| 1 ml Shampoo(Suspends DNA) | 1 (1) |  |  |
| 22.5 ml cold water(temperature) | 2 (1) |  |  |
| 5 ml cold ethanol (volume) | 3 (1) |  |  |
| Onions(DNA substrate) | 4 (1) |  |  |
| Blue food colouring(DNA stain) | 5 (1) |  |  |
| **Completion of table** | Incorrect/absent = 0 | 1-2 rows completed = 1 | 3-4 rows completed = 2 | All 5 rows completed = 3 |

 Observations (5) + Table complete (3)

**Conclusion**

Write a conclusion based on whether you can change the variables in the given procedure if you want to extract DNA successfully.

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 (3 facts x 1 = 3)

**Discussion:**

To extract a reasonable amount of DNA which variables could be changed?

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**Questions**:

2.1 Which variables, when changed, prevent DNA from being extracted?

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2.2 Which is the best source of DNA – raw wheat germ or onions? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

**Drawing Graphs**

2.3 Draw a bar graph to show the estimated amount of DNA (as a percentage).

Include the first experiment i.e. 100%, and then the 5 estimates with the changed variables. (7)

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**WORKSHEET on DNA and VARIABLES**

This worksheet must be completed and handed to your teacher by: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Questions on Extracting DNA**

1. DNA is found in all living organisms. State exactly where it is found. (1)

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Wheat germ is extracted from the wheat seed after the husks are removed. (1)

 Why is it a good source of DNA?

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1. Suggest why we do the following steps to extract DNA:
	1. The mixture is mixed with hot water and stirred. (1)

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* 1. Dishwashing liquid is added. (1)

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* 1. Why should you stir the mixture slowly? (1)

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1. Explain exactly what the slimy threads that you remove are. (1)

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1. After a blood sample is taken from a person DNA can be extracted from the white blood cells but not the red blood cells. Why is this? (1)

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**A Hands –On Experiment (Observations and Variables)**

Jono set up an experiment using 5 plant pots each with the same amount and type of soil. In each pot he planted 10 small cabbage plants which were all 4-5 cm in height at the start.

On the day after the cabbages were planted he added different amounts of liquid fertiliser to each pot. For the next 10 days he gave each pot the same amount of water. Then he recorded the results.

 Seedling leaf colour and height with different amounts of fertilizer

|  |  |  |  |
| --- | --- | --- | --- |
| **Pot** | **Amount of liquid fertiliser added (ml)** | **Colour of leaves** | **Average Height****(cm)** |
| 1 | none | Pale green | 8 |
| 2 | 5 | Green | 12 |
| 3 | 10 | Green | 15 |
| 4 | 15 | Green | 16 |
| 5 | 20 | yellow | 8 |

6. What problem was Jono investigating? (ie. what was his aim?) (1)

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7. In this investigation what was the variable that Jono deliberately changed? (1)

 We call this the independent variable.

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8. Name the two variables that he recorded at the end of the investigation. (2)

 We call these the dependent variables.

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9. Give at least 3 controlled variables and say how they were kept the same. (3)

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10. Which pot in this experiment is the control? What is the purpose of a control? (2)

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11. What can Jono conclude from this investigation? (1)

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12. Jono decided to grow cabbage plants for sale. He buys a concentrate and makes up the liquid

 fertiliser from the concentrate. What would be the best amount of fertiliser to give the plants?

 Give 3 reasons for your answer. (4)

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**Rubric for Graph (Question 2.6)**

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| **Assessment Criteria** | **Performance Indicator Levels** |
|  0 1 2  |
| **Heading**  | none | Only 1 variable | 2 variables |
| **Plotting points** | None correct | 1 -2 correct | 3-4 correct |
| **X-axis (horizontal)** | No attempt | Scale + some labels Suitable scale | Scale + all labels |
| **Y-axis (vertical)** | No attempt | Scale + label  | Scale+ label+ units |

(Max 7 marks)

 **TOTAL 50 MARKS**

Grade 12 Hands-On Practical: **EXTRACTING DNA** -MEMORANDUM

**Experiment 1: Aim:** To Extract DNA from raw wheat germ.

**Results:**

1.1 Describe what you observed in the boiling tube when you added the ethanol and then the methylene blue. (1)

*It floats on top, white stringy material is visible(or white strands stuck together), remains of wheat germ at the bottom, yellowish liquid in tube, white DNA turns blue. (They need to give as many observations as possible*

1.2 Describe what the DNA on the card looks like. (1)

*Blue strands sticking together (or any suitable description of what they see)*

1.3 **DIAGRAM**

 **3 + 1 = 4**

***(any 3 correct labels = 3, 1 mark for the shape)***

**Experiment 2:** Manipulating Variables

2.1 Write your results in the table below and then on the blackboard.

Table showing effects of changing variables on the extraction of DNA

|  |  |  |  |
| --- | --- | --- | --- |
| **Changed Variable**  | **Observations** | **Was DNA extracted?** | **Estimated %** |
| 1 ml Handy Andy/Shampoo(Suspends DNA) | *Learners need to write what they see*  | *N* | *The figures given by the learners* |
| 22.5 ml cold water(temperature) | *Learners need to write what they see*  | *Y* | *For* |
| 5 ml cold ethanol (volume) | *Learners need to write what they see*  | *Y* | *All* |
| Onions(DNA substrate) | *Learners need to write what they see*  | *Y* | *Of* |
| Blue food colouring(DNA stain) | *Learners need to write what they see*  | *Y* | *these* |

 Observations (5) + Table compete (3)

2.2 **Conclusion**

Write a conclusion based on whether you can change the variables in the given procedure if you want to extract DNA successfully. (3)

*To extract the most DNA the procedure should be kept the same, but DNA can be extracted changing some of the variables e.g. temperature and volume and some of DNA, but not dishwashing liquid.*

**Discussion:**

2.3 To extract a reasonable amount of DNA which variables could be changed? (2)

*This all depends on the results. With food colouring exactly same amount is extracted by changing the temperature of water and volume of ethanol, some DNA extracted or normal amount of DNA*

2.4 Which variables, when changed, prevent DNA from being extracted? (2)

*Using shampoo instead of dishwashing liquid, onions DNA not extracted, a different procedure*

2.5 Which is the best source of DNA – raw wheat germ or onions? (1) *Wheat germ needed*

**Drawing Graphs**

Draw a bar graph to show the estimated amount of DNA (as a percentage). Include the first experiment ie. 100%, and then the 5 estimates with the changed variables. (7)

*Graph of estimated amount of DNA when variables are changed.*

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(Max 7 marks)

***KEY:***

***X-AXIS -Variables(*** *normal method, shampoo, temperature of water, volume of ethanol, onions, blue food colouring)*

***Y-AXIS-*** *The amount of DNA estimated in %*

**Rubric for Graphs (Question 2.6)**

|  |  |
| --- | --- |
| **Assessment Criteria** | **Performance Indicator Levels** |
|  0 1 2  |
| **Heading**  | none | Only 1 variable | 2 variables |
| **Plotting points** | None correct | 1 -2 correct | 3-4 correct |
| **X-axis (horizontal)** | No attempt | Scale + some labels Suitable scale | Scale + all labels |
| **Y-axis (vertical)** | No attempt | Scale + label  | Scale+ label+ units |

**WORKSHEET on DNA and VARIABLES**

**Questions on Extracting DNA**

1. DNA is found in all living organisms. State exactly where it is found. (1)

 *Nucleus of the cell*

1. Wheat germ is extracted from the wheat seed after the husks are removed. (1)

 Why is it a good source of DNA?

 *Cells undifferentiated, usually small with a proportionately large nucleus*.

1. Suggest why we do the following steps to extract DNA:
	1. the mixture is mixed with hot water and stirred. (1)

 *break down cell membranes to allow large DNA molecules to leave cells*

* 1. dishwashing liquid is added. (1)

 *to suspend the DNA in the liquid*

* 1. Why should you stir the mixture slowly? (1)

 *To prevent the DNA strands from breaking*

1. Explain exactly what the slimy threads that you remove are. (1)

 *Many DNA molecules sticking together*

1. After a blood sample is taken from a person DNA can be extracted from the white blood cells but not the red blood cells. Why is this? (1)

*Red cells have no nucleus, DNA in the nucleus*

**A Hands –On Experiment (Observations and Variables)**

Jono set up an experiment using 5 plant pots each with the same amount and type of soil. In each pot he planted 10 small cabbage plants which were all 4-5 cm in height at the start.

On the day after the cabbages were planted he added different amounts of liquid fertiliser to each pot. For the next 10 days he gave each pot the same amount of water. Then he recorded the results.

 Seedling leaf colour and height with different amounts of fertilizer

|  |  |  |  |
| --- | --- | --- | --- |
| **Pot** | **Amount of liquid fertiliser added (ml)** | **Colour of leaves** | **Average Height****(cm)** |
| 1 | none | Pale green | 8 |
| 2 | 5 | Green | 12 |
| 3 | 10 | Green | 15 |
| 4 | 15 | Green | 16 |
| 5 | 20 | yellow | 8 |
|  |  |  |  |

6. What problem was Jono investigating? (ie. what was his aim?) (1)

*To find out if the amount of fertilizer would affect the growth of seedlings.*

7. In this investigation what was the variable that Jono deliberately changed? (1)

 We call this the independent variable.

 *The amount of fertilizer*

8. Name the two variables that he recorded at the end of the investigation. (1)

 We call these the dependent variables.

 *Colour of leaf and height of seedlings.*

9. What variables did he keep the same for each of the pots ( ie. the controlled variables).

 Give at least 3 controlled variables and say how they were kept the same. (3)

* *Same type of plant ie. Cabbage*
* *All the same height at the start (4-5 cm)*
* *Same amount and type of soil*
* *Same amount of water-a certain volume*
* *(ANY 3-THE ABOVE ARE SOME SAMPLES GIVEN)*

 10. Which pot in this experiment is the control? What is the purpose of a control? (2)

 *Pot 1 with no fertilizer.*

*It is the standard against which we compare the results of an experiment.*

11. What can Jono conclude from this investigation? (1)

  *Adding fertilizer increases the height of plants and the leaves are green. The more fertilizer*

 *the taller the plant-up to 15ml of ferlilizer.*

 12. Jono decided to grow cabbage plants for sale. He buys a concentrate and makes up the liquid

 fertiliser from the concentrate. What would be the best amount of fertiliser to give the plants?

 Give 3 reasons for your answer. (4)

*10ml as plant grows to 15cm*

 *and leaves are green,*

 *and less expensive as using 15ml for very little extra 1cm growth*

*or can say 15ml with reasons.*

**Province of the**

School stamp

**EASTERN CAPE**

**EDUCATION**

Graad 12 Self-doen Prakties: **DNA** **EKSTRAKSIE**

Manipulering van Veranderlikes Punte: 50

Naam: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Datum:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Eksperiment 1**:

**Doel:** Om DNA te ekstraheer (onttrek)uit koringgraan.

**Materiaal:**

koringgraan 2 plastiese druppers 10 ml spuitnaald

groen opwasmiddel roerstafie/lepel spatula(teelepel)

metileen blou 2 proefbuise 1 kaart grafiekpapier

yskoue etanol termometer stophorlosie

maatsilinder 5 ml maatlepel 2 glasbekers (warm en koue water)

**Metode:**

1. Gebruik die maatlepel en plaas 5 ml rou koringgraan in die proefbuis met kokende water.
2. Verander die temperatuur van die warm water tot 50-60 ºC deur koue water te gebruik.
3. Gebruik die spuitnaald en voeg 22.5ml warm water by die koringgraan in die glasbeker.
4. Roer aanhoudend vir 3 minute.
5. Roer 1 ml groen-opwasmiddel by met behulp van n plastiese drupper.
6. Roer liggies met die roerstafie vir 30 sekondes tot 3 minute.
7. Hou die proefbuis met die kokende water skuins. Voeg 15 mlkoue etanol stadig langs die kant van die proefbuis met behulp van n maatlepel.
8. Gebruik n skoon drupper en voeg 2 druppels metileenblou by. Beskryf wat gebeur.
9. Verwyder die DNA met ‘n tandestokkie of iets soortgelyk en plaas dit op die kaaart om uit te droog.

**Resultate:**

**Vraag 1: Maak van waarneming.**

1.1 Beskryf sorgvuldig wat jy waargeneem het toe etanol bygevoeg was en metileenblou daarna. (1)

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1.2 Beskryf die voorkoms van die DNA wat jy op die kaart geplaas het om uit te droog. (1)

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1.3 Maak n skets met byskrifte van DNA en dui alle komponente aan. (4)

**Eksperiment 2: Manipuleering van Veranderlikes**

‘n Veranderlike iets wat die resultate van ‘n eksperiment kan beinvloed.

Manipulelring van veranderlikes – kan DNA nog onttrek / ektraheer word?

Elke groep sal nou die eksperiment herhaal, maar sal **EEN** veranderlike verander. Elke groep sal ‘n verskillende veranderlike verander.

* Groep A: Voeg 1 ml haarwasmiddel by (in plaas van 1ml groen opwasmiddel).
* Groep B: Voeg 22.5ml koue water by (in plaas van warm water).
* Groep C: Gebruik 5 ml koue etanol (in plaas van 15 ml).
* Groep D: Gebruik uie ( in plaas van koringgraan).
* Groep E: Voeg voedselkleurstof by ( in plaas van metileenblou).

Skat hoeveel DNA onttrek is in vergelyking met die eerste eksperiment. (Gee jou antwoord as ‘n persentasie dit die eerste hoeveelheid. (bv. As jy slegs die helfte van die hoeveelheid gekry het, sal jou antwoord = 50%.)

Dui jou resultate eers in die onderstaande table aan en skryf dit daarna op die skryfbord neer.

Tabel wat die invloed van die veranderlikes op die ektraksie van DNA aantoon.

|  |  |  |  |
| --- | --- | --- | --- |
| **Veranderlike**  | **Waarnemings** | **Was DNA ektraheer?** | **Geskatte %** |
| 1 ml Haarwasmiddel(Suspends DNA) | 1 (1) |  |  |
| 22.5 ml kou water(temperatuur) | 2 (1) |  |  |
| 5 ml koue etanol (volume) | 3 (1) |  |  |
| Uie(DNA substraat) | 4 (1) |  |  |
| Blou voedselkleursel(DNA vlek) | 5 (1) |  |  |
| **Voltooiing van tabel** | Inkorrek/afwesig  = 0 | 1-2 rye voltooid = 1 | 3-4 rye voltooid = 2 | Al 5 rye voltooid = 3 |

 Waarneming (5) + Tabel voltooid (3)

**Gevolgtrekking**

Skryf ‘n gevolgtrekking neer op grond van hoe suksesvol DNA ekstraheer was met die veranderde veranderlike waarmee jy gewerk het.

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 (3 feite x 1 = 3)

**Bespreking:**

Watter veranderlike kan verander word om ‘n redelike hoeveelheid DNA te onttrek?

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Vrae:

2.1 Watter veranderlikes, wanneer dit verander word, verhoed dat DNA onttrek word? (2)

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2.2 Wat is die beste bron van DNA- koringgraan of uie? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

 **(5)**

**Teken van Grafieke**

2.6 Teken ‘n Kolomgrafief om die geskatte hoeveelheid DNA (as ‘n persentasie) aan te dui. Sluit die eerste eksperiment d.i. 100% in en daarna die ander vyf geskatte hoeveelhede waardes DNA. (maks = 7)

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 **WERKKAART van DNA en VERANDERLIKES**

Hierdie werkkaart moet voltooi word en aan u onderwyser ingehandig word teen: **\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **Naam:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Datum: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Vrae oor die Ektraksie/ Onttrekking van DNA**

1. DNA word in alle lewende organismes gevind. Sê presies waar dit gevind word. (1)

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Waarom is Koringgraan ‘n goeie bron van DNA? (1)

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1. Stel voor waarom die volgende stappe gevolg word on DNA te ekstraheer:
	1. Die mengsel met warm water gemeng en geroer word. (1)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Wasmiddel word bygevoeg. (1)

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* 1. Waarom moet jy die mengsel stadig roer? (1)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Verduidelik presies wat die sluimerige stringe wat jy verwyder het, is. (1)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Nadat ‘n bloedmonster van ‘n person geneem is kan DNA geekstrasheer word uit witbloedselle maar nie uit rooibloedselle nie. Waarom is dit die geval? (1)

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**‘n Selfdoen Eksperiment – (waarneembare veranderlikes)**

Jono het ‘n eksperiment opgestel deur gebruik te maak van 5 potplante met dieselfe hoeveelheid en tipe grond. In elke een het hy 10 klein koolplante geplant wat elk omtrent 4-5 cm hoog was.

Die dag nadat hy die koolplante geplant het, het hy verskillende hoeveelhede vloeibare groeistof in elke potplant gegooi. Vir die volgende 10 dae het hy dieselfde hoeveelheid water by elke potplant gegooi. Daarna het hy die resultate aangedui.

Saailinge se blaarkleur en hoogte by veskillende hoeveelhede groeistof.

|  |  |  |  |
| --- | --- | --- | --- |
| **Pot** | **Hoeveelheid vloeibare groeistof bygevoeg (ml)** |  **Kleur van blare** | **Gemiddelde Hoogte****(cm)** |
| 1 | Geen | Liggroen | 8 |
| 2 | 5 | Groen | 12 |
| 3 | 10 | Groen | 15 |
| 4 | 15 | Groen | 16 |
| 5 | 20 | Geel | 8 |

1. Wat het Jona ondersoek? ( nl. wat was sy doel?) (1)

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

7 Watter veranderlike in hierdie ondersoek het Jona opsetlik verander? Dit word die onafhanklike veranderlike genome. (1)

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 8. Noem die twee veranderlikes wat hy opgeteken het aan die einde van die ondersoek.

 Dit word die afhanklike veranderlike genoem. (2)

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9. Gee ten minste 3 verandelikes en sê hoe hy dit konstant gehou het (3)

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1. Watter pot in hierdie eksperiment is die kontrole? Wat is die doel van die kontrole? (2)

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1. Wat was Jona se gevolgtrekking in hierdie ondersoek? (1)

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1. Jono het besluit om koolplante te groei om te verkoop. Hy het ‘n konsentraat gekoop wat hy gebruik het om ‘n vloeibare groeistof te maak. Wat sal die beste hoeveelheid van hierdie groeistof wees om by die plante te voeg? Gee 3 redes vir jou antwoord. (4)

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Rubriek van Grafieke (Vraag 2.6)**  (Maks 7 punte)

|  |  |
| --- | --- |
| **Assesserings kriteria** | **Prestasie aanduiders** |
|  0 1 2  |
| **Titel**  | Geen | Slegs 1 veranderlik | 2 veranderlikes |
| **Koördinate** | Geen korrek | 1 -2 korrek | 3-4 korrek |
| **X-aksis (horisontaal)** | Geen poging | Skaal + sommige byskrifte. Pasbare skaal | Skaal + alle byskrifte |
| **Y-aksis (vertikaal)** | Geen poging | Skaal + label  | Skaal + byskrifte + eenhede |

**  Province of the**

 **EASTERN CAPE**

 **EDUCATION**

**LIFE SCIENCES**

**Learner’s File**

**Formal Assessment Tasks**

**Grade 12**

Name of Learner:

……………………………………………………………………………………………………………………..

Name of the School:

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(Name of the District:

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201….

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**Contents:**

* + - **Program of Assessment (7 Tasks)**
		- **Consolidation Form**
		- **Declaration Form**
* **Formal Assessment Tasks:**
	+ - * **Assignment**
			* **Practical Tasks**

**Hands-on Practical**

**Hypothesis Testing Practical**

* + - * **Controlled Test**

**Test 1**

**Test 2**

* + - * **Examinations**

**Midyear (June)**

 **Paper 1**

**(**Life at Molecular, Cellular and Tissue Level & Diversity, Change and Continuity**)**

**Paper 2**

**(**Life Processes in Plants and Animals**)**

* + - * **Trial (September)**

 **Paper 1**

**(**Life at Molecular, Cellular and Tissue Level & Diversity, Change and Continuity**)**

 **Paper 2**

 **(**Life Processes in Plants & Animals, and Enviromental Studies**)**

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| --- |
| **PROGRAMME OF ASSESSMENT** |
| **ASSESSMENT TASKS (CASS)** |  | **End-of-year examination** |
| **Percentage allocated** | 25% |  | 75% |
| **Forms of assessment** | Practical task1 & 2 | Assignment | Controlled tests 1& 2 | Midyear/June examination | Trial examination | November Examinations |
|  | 1st & 3rd terms | 1st term | 1st & 3rd term | 2nd term | 3rd term | 4th term |
| **Number of pieces** | 2 | 1 | 2 | 2 question papers | 2 question papers | 2 question papers |
| **Marks** | 20 | 20 | 20 | 10 | 10 | 10 | 10 |  |
| **Sub totals** | **100** | **300** |
| **Grand Total** | **400** |

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|  **EASTERN CAPE DEPARTMENT OF EDUCATION** **……………………………………………… DISTRICT**  **Grade 12**  **LIFE SCIENCES LEARNER SBA Recording Sheet** |
| **NAME OF LEARNER** |  | **EXAMINATION NUMBER** |  |
| **SCHOOL**  |  | **CENTRE NUMBER** |  |
| **NAME OF TEACHER** |  |
| **Assessment Task** | **Minimum****mark** | **Mark obtained** | **Programme of****Assessment weighting** | **Converted** **mark** |
| **Assignment**  | **60** |  |   |  |
| **Total Assignment Mark** | **20** |  |
|  |  |  |  |  |
| **Practical Tasks** |  |  |  |  |
| Hands-on practical | **50** |  |  20 |  |
| Hypothesis Testing Practical | **50** |  |  20 |  |
| **Total practical Tasks** |  **40** |  |
|  |  |  |  |  |
| **Controlled Tests:** |  |  |  |  |
| Test 1 | **100** |  |  10 |  |
| Test 2  | **100** |  |  10 |  |
| **Total Controlled tests** |  **20** |  |
|  |  |  |  |  |
| **June/Midyear Exam P1** | **150** |  |  |  |
| **June/Midyear Exam P2** | **80** |  |  |  |
| **Total of June Exams: 230** |  | **10** |  |
| **Trial/September Exam P1** | **150** |  |  |  |
| **Trial/September Exam P2** | **150** |  |  |  |
| **Total of Trial Exams 300** |  |  **10** |  |
| **Total marks for Programme of Assessment** | **100** |  |

 **MODERATION PANEL**

|  |  |  |  |
| --- | --- | --- | --- |
|  **DESIGNATION** |  **NAME IN PRINT** |  **SIGNATURE** |  **DATE** |
| **Head of Department** |  |  |  |
| **Principal** |  |  |  |
| **Cluster Leader** |  |  |  |
| **District Official** |  |  |  |
| **Provincial Official** |  |  |  |
| **National/ UMALUSI** |  |  |  |

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 **DECLARATION FORM**

**Surname & Name/s of learner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Examination number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name of school: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Centre Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Declaration by Learner**

**I hereby declare that the work contained in this portfolio is my own original work.**

**Signature of learner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Declaration by teacher:**

**As far as I am able to ascertain, the work in this portfolio is the original work of this candidate. All required work has been included in the portfolio.**

**Signature of Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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