**GENERAL INTEGRATED SCIENCE– UNIT 1**

**TASK 5 – Impact of Abiotic Factors on Organism Growth Practical**

**MARKING KEY**

1. Identify the:

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Independent variable correctly identified – type of soil | 1-2 |
| Dependent variable correctly identified – mungbean height (after 4 weeks) |
| **TOTAL** | **2** |

1. Write a hypothesis for this experiment:

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Testable | 1-2 |
| States clear relationship between independent and dependent variable |
| **TOTAL** | **2** |

1. List three controlled variables needed for this experiment.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Any three appropriate variables listed: amount of water, amount of sunlight, amount of time left to germinate, amount of time left to grow, same type of water for all mungbeans, etc | 1-3 |
| **TOTAL** | **3** |

**Results**

1. Observe your mungbeans and their soil. Write two observations, one about the mungbean growth and one about the appearance of the soil, in the table below.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **Kalgoorlie Soil** | 1 |
| Makes 2 points about soil appearance: large particles, red |
| Plant growth: correct description about plant health, # that have sprouted, etc |
| **Compost Soil** | 1 |
| Makes 2 points about soil appearance: larger particles, small woodchips in way, dark brown |
| Plant growth: correct description about plant health, # that have sprouted, etc |
| **Coffee Ground** | 1 |
| Makes 2 points about soil appearance: no drainage, dark brown, strong odour |
| Plant growth: correct description about plant health, # that have sprouted, etc |
| **TOTAL** | **3** |

1. Record your results in the table below.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Title has both variables | 1-3 |
| Removes outlier (plant 4, Kalgoorlie soil) |
| Correctly calculates averages (23.6, 4.75, 1.25) |
| **TOTAL** | **3** |

1. Graph your results for the average height of the mungbean plants, in different soils, on the grid below.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Title has both variables | 1-6 |
| Bar graph drawn |
| Axis are correctly labelled |
| Correct units on each axis |
| Correct scale |
| Plotted neatly |
| **TOTAL** | **6** |

1. Describe any trends in your results by referring to the data.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Describes correct trend  *(Mungbeans will grow the fastest and tallest in Kalgoorlie sand and then compost, with very few growing at all in coffee ground)* | 1-2 |
| Refers to the data |
| **TOTAL** | **2** |

1. State one way to improve this experiment and explain why it would improve the reliability of the results.

|  |  |
| --- | --- |
| Description | Marks |
| States an appropriate improvement *(measuring amount soil, watering regularly, maintaining more constant room temp, allowing for more direct sunlight, etc)* | 1-2 |
| Explains how that improvement would actually give more accurate impact of soil type of mung bean growth |
| TOTAL | 2 |

1. Read the information above. Using this information, and your understanding of abiotic factors, explain the trend in your results *(why did the mungbeans grow best in certain soil?)*

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Mungbeans like to grow with a lot of drainage – Kalgoorlie sand has good drainage | 1-3 |
| Mungbeans don’t like to grow with things in the way – compost had wood chips in the way |
| Mungbeans like sandy/loam soil – Kalgoorlie soil is loam (sand with some clay) |
| Coffee grounds had poor drainage |
| **TOTAL** | **3** |

1. Write a scientific conclusion for this experiment.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| States whether hypothesis was supported or not | 1-2 |
| Mungbeans don’t like to grow with things in the way – compost had wood chips in the way |
| **TOTAL** | **2** |

1. Identify one question that this data raises that we cannot answer with the information we currently have.

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Identifies a question that cannot be answered with current data | 1 |
| **TOTAL** | **1** |