**GENERAL INTEGRATED SCIENCE – UNIT 3 – WEIGHTING 11%**

**TASK 2 – Sampling practical Total Marks /**

**Part 1 Marking Key** **Soils Investigation /21**

**Introduction: (6 marks)**

Mentions types of soils at least 3 . 3 marks

Identifies properties for the identified types of soils at least 3 properties 3 marks.

**Materials:**

A list of materials used to conduct the task. **(2 marks)**

**Planning :**

**States a hypothesis, 2 marks**

**States the aim of the investigation 1 mark**

**Lists a range of variables at least 4. 2 marks**

**From the list above identifies independent and Dependant variables, 2 marks**

**States at least 2 variables that need to be controlled 2 marks**

**Suggests ways of controlling the stated variables 1 mark**

**Outlines a procedure that can be replicated by other scientists 1 (11 marks)**

**Safety considerations:**

An explanation of safety considerations associated with this investigation. **(2 marks)**

**Part 2 /19 Marks**

**Processing Results**

Based on your results for Experiment A Answer the following questions.

1. **A suitable If…. Then … Statement**
2. I dentify the dependent variable? 1 mark **Time it takes for the water do reach the base of the test tube (do not accept answers such as “time” without further information.**
3. Identify the independent variable. 1 mark **Type of soil**
4. In the space below draw up a table to record your results. 2 marks **1 mark for results obtained. 1 for units shown in the table header and not repeated in the rest of the table.**
5. Using whole sentences, write a summary of your results below. 3 marks **3 simple sentences summarising the results shown in the table.**
6. Based on your summary of results above write a conclusion for this experiment. 1 mark **A sentence that states which type of soil allows water to drain through the fastest.**
7. Give an explanation for the results obtained. 3 marks **(1 for an explanation for each soil type). Explanation should refer to the how structure influences drainage**.

**Experiment B**

**Table of Results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample Tested** | **No chemicals added** | | **Chemicals added** | | | |
|  | **Colour of UI** | **pH Range & Colour** | **Sodium hydrogen Carbonate** | **pH Range & Colour** | **Aluminium**  **Sulphate** | **pH Range & Colour** |
| **Distilled Water** | Lime Green - Green | 6-7 | Green- Blue | 7-9 | Red- Yellow | 3-5 |
| **Humus Soil water** | Lime Green - Green | 6-7 | Green- Blue | 7-9 | Red- Yellow | 3-5 |
| **Clay Soil Water Water** | Lime Green - Green | 6-7 | Green- Blue | 7-9 | Red- Yellow | 3-5 |
| **Sandy Soil Water** | Lime Green - Green | 6-7 | Green- Blue | 7-9 | Red- Yellow | 3-5 |

Why did we test the pH of distilled water? 1 mark

**It was our control**

For both experiment A and B why did we use distilled water instead of tap water? 1 mark

**Distilled water does not have dissolved (minerals) chemicals or any reasonable answer suggesting the purity of distilled water.**

Western Australia is rich in mineral while this is a good thing for the mining industry this can more often than not present challenges for farmers. When salts dissolve in water they can make the soil acidic (low pH), Basic (High pH) or Neutral (in between pH). Most plants have a specific pH range tolerance as shown by the table below.

| pH Range | | | |
| --- | --- | --- | --- |
| **5.0 – 5.5** | **5.5 – 6.5** | **6.5 – 7.0** | **8-12** |
| Blueberries  Irish Potatoes  Sweet Potatoes | Barley, Bluegrass, Corn  Cotton, Grain Sorghum  Peanuts, Rice, Soybeans  Watermelon, Wheat | Alfalfa  Some Clovers  Sugar Beets | Cabbages  Cauliflower  Broccoli |

From the list above which crop is commonly grown in WA? 1 mark

**Wheat**

Based on your answer above, would you say minerals in WA soil make it acidic basic or neutral? Explain. 2 marks

**Acidic (1) because mostly plants that require acidic soils are commonly grown in WA (1)**

If WA farmers want to grow cabbages what chemical do they need a high or low pH? 1 mark **High pH**

What Chemical would you advise them to use for changing the soil pH? Use your findings to explain your answer. 2 marks

**Lime (Calcium Hydroxide) because based on our results it changed the pH of soil from acid to basic.**