**GENERAL INTEGRATED SCIENCE – UNIT 3**

**TASK 2 – Sampling practical**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 11 %**

**DUE DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK: \_\_\_\_\_\_ / = \_\_\_\_\_\_ %**

**Part 1 \_\_\_\_\_\_/ Part 2 \_\_\_\_\_\_/**

**Question: *Do different types of soil have different properties?***

**Experiment: A Testing Drainage**

**Materials:**

3 test tubes (same size)

1 test tube holder

1 plastic spoon

3 soils: clay, humus, sand

10 mL Small Measuring Cylinder

Distilled Water

Stopwatch

**Procedure:**

Work in teams of three. (However, each student will turn in their own

results, analysis and conclusion.)

1. Place 3 test tubes (same size) in test tube hold.
2. Half fill 3 test tubes with sand, humus and clay soil
3. Adjust soil levels so all test tubes are equal.
4. Measure 20 mL of distilled water using a measuring cylinder
5. One person looks at the clock (second hand) while other person empties the 20 mL of water into the test tube of clay.
6. Time how long it takes the water to first reach the bottom of the test tube.
7. Record time on data table.
8. Repeat steps 1 to 9 using clay and sand. Record the results.

**DO not throw away the samples tested you will use them in Experiment B**

**Experiment B : Testing soil pH**

**Materials**

3 100 ml beakers

1 funnel

Test Tube

3 filter papers

3 soils: clay, humus, sand used in Experiment A

Distilled water

Universal Indicator

pH Scale card.

Paper towel.

Ammonium Nitrate (Aluminium Nitrate can be used as well)

Calcium Carbonate (Sodium bicarbonate can be used as well)

1. Add a small amount of distilled water into a clean test tube, to that add a few drops of the universal indicator and record your results in a table
2. Transfer the humus soil sample tested in Experiment A into a beaker clean dry beaker.
3. Add water enough to cover the soil sample by about 3cm and stir several times.
4. Setup filtering equipment as illustrated by your teacher.
5. Filter the water into a second beaker.
6. Add a few drops of Universal Indicator to the filtrate and record your results in a table.
7. Extract a small sample of the filtrate that has the Universal indicator using a dropper pipette and transfer it into another clean test tube.
8. To the extracted sample add granules of Ammonium nitrate and record your observations in the table of results provided.
9. Extract a second sample of the filtrate that has the Universal indicator using a dropper pipette and transfer it into a clean test tube.
10. To the extracted sample add a spatula of full of calcium carbonate and record your observations in the table of results provided.
11. Repeat steps 1 to 9 above using sand and clay soil

**GENERAL INTEGRATED SCIENCE – UNIT 3**

**TASK 4 – Sampling practical**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 5 %**

**DUE DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK: \_\_\_\_\_\_ / = \_\_\_\_\_\_ %**

**Task one \_\_\_\_\_\_/5 Task two \_\_\_\_\_\_/16**

Processing Results

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

1. For this experiment write a suitable hypothesis. 2 marks

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1. Identify the dependent variable? 1 mark

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1. Identify the independent variable. 1 mark

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1. In the space below draw up a table to record your results. 2 marks
2. Using whole sentences, write a summary of your results below. 3 marks

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1. Based on your summary of results above write a conclusion for this experiment. 1 mark

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1. Give an explanation for the results obtained. 3 marks \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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** |  |  |  |  |  |  |
| **Humus Soil water** |  |  |  |  |  |  |
| **Clay Soil Water Water** |  |  |  |  |  |  |
| **Sandy Soil Water** |  |  |  |  |  |  |

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

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

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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 |

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

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

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

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

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