Name:

Date:

School:

Facilitator:

2.09 Soil Lab (50 Points)

**Use the Soil Analysis Virtual Lab linked on the Task page to complete this worksheet.**

# Part 1: Pre-Lab

**Respond to the following questions in complete sentences.**

1. Is soil class or individual evidence? Explain why. (3 points)
2. Briefly describe the crime and your role as the soil lab technician. (3 points)
3. In what ways can soil be analyzed? **What tools can be used during analysis?** (5 points)

|  |
| --- |
| *Write your response below:* |
|  |

# Part 2: Experiments #1 and #2 General Appearance of the Soil Samples, Before and After Heating

**Complete the chart below.** (10 points)

| **Sample** | **Under Direct Light** | | **Under Polarized Light (birefringence)** | | **Under Ultraviolet Light** | |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Before Heating** | **After Heating** | **Before Heating** | **After Heating** | **Before Heating** | **After Heating** |
| Crime Scene |  |  |  |  |  |  |
| Sample F |  |  |  |  |  |  |
| Sample G |  |  |  |  |  |  |
| Sample H |  |  |  |  |  |  |
| Sample I |  |  |  |  |  |  |
| Sample J |  |  |  |  |  |  |

1. Based on the results of this experiment, what soil samples (if any) clearly have properties that differ from the "crime scene" evidence? Explain your reasoning. (1 point)

# Part 3: Experiment #3 Acidity of Soil Samples

**Complete the chart below.** (5 points)

| **Sample** | **Color of Indicator** | **Approximate pH** | **Type of Solution**  **(acid, base/alkaline, or neutral)** |
| --- | --- | --- | --- |
| Crime Scene |  |  |  |
| Sample F |  |  |  |
| Sample G |  |  |  |
| Sample H |  |  |  |
| Sample I |  |  |  |
| Sample J |  |  |  |

1. Based on the results of this experiment, what soil samples (if any) clearly have properties that differ from the "crime scene" evidence? Explain your reasoning. (1 point)

# Part 4: Experiment #4 Range of Particle Sizes of Soil Samples -- Mass and Relative Amount

**Complete the chart below. When completing the ranking section for each sample, using the metric: 4 = greatest, 1 = least.** (6 points)

| **Sample** | **Top of 1st Sieve (most coarse)** | | **Top of 2nd Sieve (medium)** | | **Top of 3rd Sieve (fine)** | | **Through 3rd Sieve (finest)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mass (g)** | **Rank** | **Mass (g)** | **Rank** | **Mass (g)** | **Rank** | **Mass (g)** | **Rank** |
| Crime Scene |  |  |  |  |  |  |  |  |
| Sample F |  |  |  |  |  |  |  |  |
| Sample G |  |  |  |  |  |  |  |  |
| Sample H |  |  |  |  |  |  |  |  |
| Sample I |  |  |  |  |  |  |  |  |
| Sample J |  |  |  |  |  |  |  |  |

1. Based on the results of this experiment, what soil samples (if any) clearly have properties that differ from the "crime scene" evidence? Explain your reasoning. (1 point)

# Part 5: Analysis and Post Lab Reflection

**Respond to the following questions in complete sentences.** (5 points each)

1. What is your recommendation as the soil lab technician to the investigators on this case? Are you able to determine if any of the five suspect samples match the crime scene sample? Explain your reasoning using specifics from the experiments you performed.

|  |
| --- |
| *Write your response below:* |
|  |

1. What difficulties might a crime scene investigator face in analyzing soil samples from a crime scene and comparing it to the samples?

|  |
| --- |
| *Write your response below:* |
|  |

1. What was most difficult about this lab?

|  |
| --- |
| *Write your response below:* |
|  |