Name:

Date:

School:

Facilitator:

# **7.05 Soil Types Lab**

## Part One Directions: Visit [Glencoe Virtual Labs: Soil Types Lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT02/CT02.html) to complete the Soil Types Lab. First, read the information in the left hand column that tells you about soil type, particle sizes, porosity, and permeability. Make sure you read all the way down to the “Objectives” heading. After reading the information, complete the lab by running a test on the 12 different types of soil. Complete the following procedure to complete the soil tests.

**Procedure:**

1. Slide the bars on the left and right of the soil meter to select your soil type.
2. Slide the bars until you have “sand” in the green box below the soil meter.
3. Click the “Test Soil” tab to deposit the soil in the funnel.
4. Click the “Pour Water” tab to dispense the water into the soil.
5. Record the “amount poured” [black box to the right] in the appropriate box in the chart below. This number is the amount of water [in mL] that the soil type held.
6. Calculate the porosity of the soil by dividing the volume of water by the volume of soil (100 mL) X 100. You can also see the porosity formula by clicking on the “Formula” tab in the lower left.
7. Enter the porosity in the appropriate box in the table below.
8. Click the “Reset” tab in lower right.
9. Repeat steps 1-8 for the other 11 types of soil listed in the table below.
10. Hint: You may have to slide both bars on the soil meter or just one to get the appropriate soil type. Make sure the soil type that you are testing is listed in the green box below the soil meter before running the test.

|  |  |  |
| --- | --- | --- |
| **Soil Type** | **Amount Poured mL**  **(amount of water soil held)** | **Porosity %** |
| 1. Sand |  |  |
| 1. Loamy Sand |  |  |
| 1. Sandy Loam |  |  |
| 1. Silt |  |  |
| 1. Silt Loam |  |  |
| 1. Loam |  |  |
| 1. Sandy Clay Loam |  |  |
| 1. Sandy Clay |  |  |
| 1. Clay Loam |  |  |
| 1. Silt Clay |  |  |
| 1. Clay |  |  |
| 1. Heavy Clay |  |  |

## Part Two Directions: Answer the following analysis questions based on what you learned by reading the lab information and conducting the Soil Type Lab.

1. Which soil type had the greatest porosity? How do you know this?
2. Which soil type had the greatest permeability? How do you know this?
3. Explain how porosity and permeability are related.
4. What are the three particles that determine soil structure? List them from largest to smallest particle size.
5. Based on what you learned in this lab, explain why you would not use a sand soil and a heavy clay soil to plant your garden. [Use the words permeable/permeability and porosity in your explanation]. Which of the 12 types of soils tested would you use? Explain why.
6. Using the formula from the lab, calculate the porosity of a 250 mL soil sample that held 60 mL of water. Comparing this to the chart above, what do you think is the soil type of this sample? Will this type of soil have a high or low permeability and how can you tell?