Soil Profile Lab

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Names: Student role for lab:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Canopy type:

Explain your soil profile site; mixed forest, predominantly coniferous, predominantly deciduous, location, slope, drainage and exposure.

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Sketch of your soil profile site:

Profile Description:

Organic Horisons

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| Horizon  L – M - F | Depth  cm | Roots: Quantity, size, shape, % | Description of materials(dead) other than roots | Color smear |
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Mineral Horizons

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| Horizon  A – B – C include subhorizons | Depth  cm | Texture- sand vs. clay – ribbon test | Structure – distinct size and shape | Consistency | Roots: Quantity, size, shape, % | Color Smear |
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Profile Field Sketch

Profile Labels Note/ Observations:

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Material: create a list of all the materials used in this activity:

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Explain the procedure for creating a soil profile:

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Explain the procedure for performing a ribbon test, what are you testing for?

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Concluding statement about your soil profile: What did your group observe and what type of soil did you find?

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**Soil texture**

Soil texture is the relative proportion of sand, silt and clay particles that make up a given soil. These particles are graded according to their diameter, with sand particles being the coarsest and clay particles the finest. Soils are typically rated by their texture ([Table 1](http://www.cmhc-schl.gc.ca/en/co/maho/la/la_001.cfm#table1)).

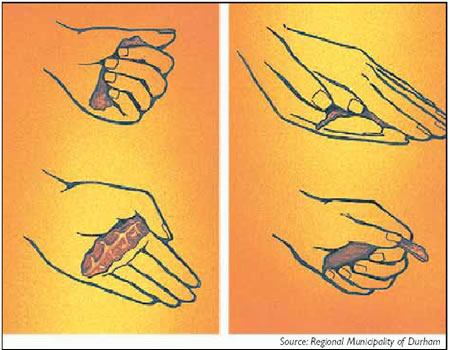
A soil’s texture directly influences its nutrient content, moisture and drainage capacity. Clay soils tend to be fertile, but are often wet and poorly drained. Sandy soils drain easily but can be drought-prone and infertile. Loams retain moisture and are fertile and friable (crumbly and easy-to-work). Loam soil contains about 40 per cent sand, 40 per cent silt and 20 per cent clay, along with plenty of humus. Many plants tolerate a variety of soil textures, while some have more specific soil requirements.

**Field Tests: Soil Texture**

These three simple tests can help you determine your soil’s texture. See also [Table 1](http://www.cmhc-schl.gc.ca/en/co/maho/la/la_001.cfm#table1) and [Figure 2](http://www.cmhc-schl.gc.ca/en/co/maho/la/la_001.cfm#fig2). A soil test kit or a testing laboratory can do more accurate testing.

1. Feel test: Thoroughly dry and crush a small amount of the soil by rubbing it with the forefinger in the palm of your other hand. Then rub some of it between your thumb and fingers to measure the percentage of sand. The grainier it feels, the higher the sand content.
2. Moist cast test. \* Compress moist soil by squeezing it in your hand. When you open your hand, if the soil holds together (that is, forms a cast), pass it from hand to hand — the more durable the cast, the higher the percentage of clay.
3. Ribbon test. \* Roll a handful of moist soil is into a cigarette shape and squeeze it between your thumb and forefinger to form the longest and thinnest ribbon possible. Soil with high silt content will form flakes or peel instead of forming a ribbon. The longer and thinner the ribbon, the higher the percentage of clay.

\*For these tests, the soil specimen should be gradually moistened and thoroughly reshaped and kneaded to bring it to its maximum "plasticity" and to remove dry lumps. Do not add too much water, as the sample will lose its cohesion.

  
Figure 2 — Testing soil texture: the moist cast test (left) and the ribbon test (right)

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| **Table 1: Field Tests for Soil Texture** | | | |
| **Texture** | **Feel Test** | **Moist Cast Test** | **Ribbon Test** |
| Sand | Grainy, little floury material | No cast | Can't form a ribbon |
| Loamy sand | Grainy with slight amount of floury material | Very weak cast, does not allow handling | Can't form a ribbon |
| Silty sand | Some floury material | does not allow handling | Can't form a ribbon |
| Sandy loan | Grainy with a moderate amount of floury material | Weak cast, allows careful handling | Barely forms a ribbon — 1.5 -2.5 cm (0.6 -1 in.) |
| Loam | Fairly soft and smooth with obvious graininess | Good cast, easily handled | Thick and very short - <2.5 cm (1 in.) |
| Silt loam | Floury, slight graininess | Weak cast, allows careful handling | Makes flakes rather than a ribbon |
| Silt | Very floury | Weak cast, allows careful handling | Makes flakes rather than a ribbon |
| Sandy clay loam | Very substantial graininess | Moderate cast | Short and thick — 2.5 - 5 cm (1 - 2 in.) |
| Clay loam | Moderate graininess | Strong cast clearly evident | Fairly thin, breaks easily, barely supports its own weight. |
| Silty clay loam | Smooth, floury | Strong cast | Fairly thin, breaks easily, barely supports its own weight. |
| Sandy clay | Substantial graininess | Strong cast | Thin, fairly long, 5-7.5 cm (2 - 3 in.). Holds its own weight. |
| Silty clay | Smooth | Very strong cast | Thin and fairly long, 5 - 7.5 cm (2 - 3 in.). Holds its own weight. |
| Clay | Smooth | Very strong cast | Very thin and very long — >7.5 cm (3 in.) |

Table adapted from Denhom, K.A. and L.W. Schut, 1993. Field Manual for Describing Soils in Ontario. Centre for Soil Resource Evaluation. Guelph, Ont.