



LESSON PLAN: Mini Soil Monoliths

Introduction:

Soil monoliths represent a cross-section of a soil pit. Students can make their own miniature soil monoliths to understand how and why the soil changes with depth.

Prescribed learning outcomes (PLO) are content standards for the provincial education system; they are the prescribed curriculum. The "Mini Soil Monoliths" lesson plan will help students to achieve the following BC PLOs¹:

- Earth Science 11 – Surface Processes and the Hydrosphere (F1-F3)
- Geology 12 - Surface Processes and the Hydrosphere (F1, F4)
- Geography 12 – Themes and Skills (A2-A4); Gradational Processes (C1-C3); Weather and Climate (D2, D5-D7); Biomes (E3); Resources and Environmental Sustainability (F1, F2)

Learning Objectives:

- Become aware that the soil is composed of multiple layers called “horizons”

Materials:

- dark coloured dry soil labelled “A”, lighter coloured soil labelled “B”, coarse (and light) coloured soil labelled “C”
**Note: the soils used must be pre-dried and also ground up so that it is less clumpy and will stick to the tape/glue better. Soil can be ground using a rolling pin.
- paper with a strip of double-sided tape on it (can use glue as an alternative)

Activity Description:

Stick a length of double-sided tape (~8 cm long) on to a piece of paper. The paper can be labelled with horizons A B and C as a guide. Tear down the tape 1/3 of the way, exposing the sticky part of the tape. Pour the dark A horizon soil on to the tape, and brush off the excess. Tear down the tape another 1/3, and pour the light B horizon soil on to the tape. Tear all of the tape off, and pour on the coarse C horizon soil. And voila! A mini soil monolith!

¹ Please consult the appropriate Integrated Resource Package (IRP) to identify the PLOs. A catalogue of the BC Curriculum Documents (including IRPs) can be found here: <http://www.bced.gov.bc.ca/irp/all.php?lang=en#>



Photo: Dru Yates

Figure 10. A mini soil monolith, composed of 3 main horizons.

The top A horizon is dark because of the organic matter inputs from plants and roots. Some students might have fun drawing trees/flowers/grass on the surface of their mini monolith – this can help demonstrate the concept of vegetation decomposing at the soil’s surface. The B horizon is lighter in colour because it doesn’t have as much organic matter as at the surface. The C horizon is coarse and rough because it is the farthest underground. Soil is developed from bedrock below the Earth’s surface. The C horizon is the closest to the bedrock and is protected from weathering below many layers of minerals above, so it is the least developed horizon.

Soil scientists make larger versions of these monoliths using a glue-like hardening compound. Some examples of real soil monoliths can be found here: <http://soilweb.landfood.ubc.ca/monoliths/>.