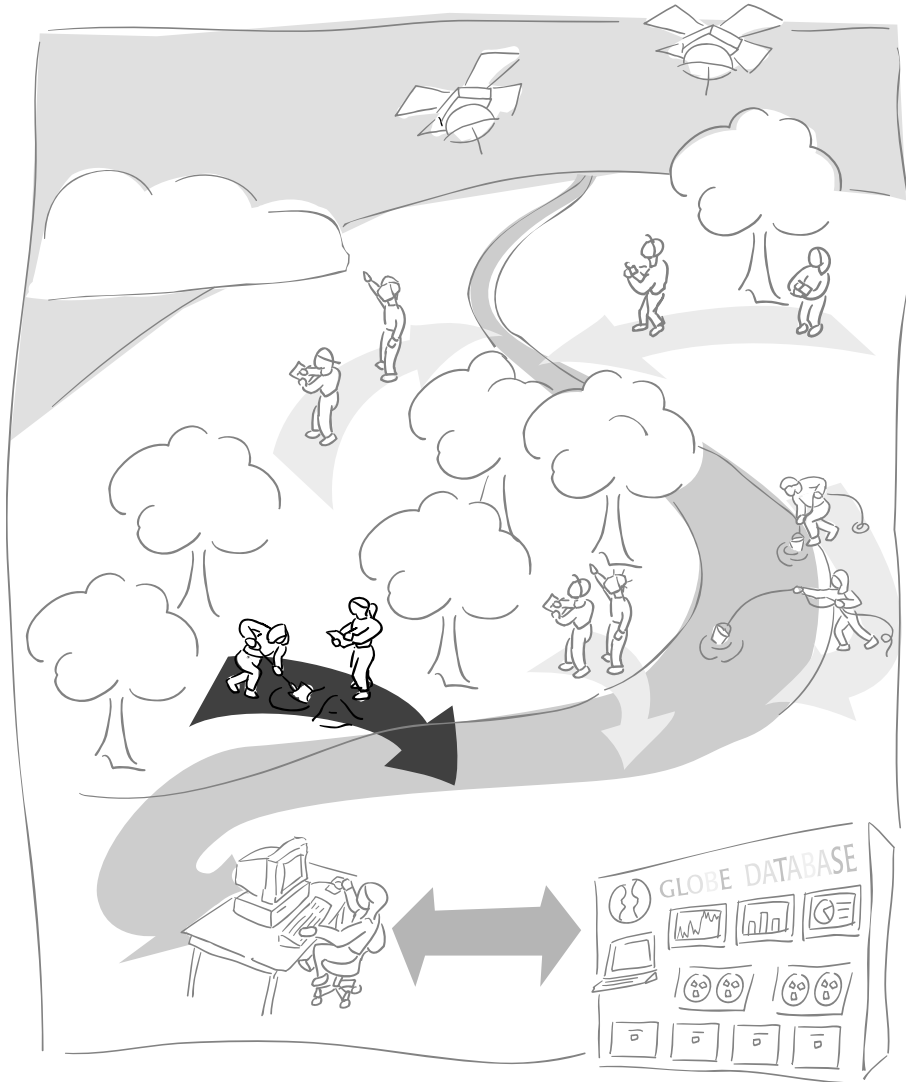


Soil (Pedosphere) Investigation



A GLOBE® Learning Investigation



Soil (Pedosphere) Investigation at a Glance



Protocols

Measurements taken at Soil Characterization Sites:

top and bottom depths for each horizon in the soil profile
structure, color, consistence, texture, and amounts of rocks, roots,
and carbonates

bulk density, particle density, particle size distribution, pH, and
fertility (N, P, K) of samples taken from each horizon

Measurements taken at Soil Moisture or Atmosphere Sites:

soil moisture monitored during annual campaigns, 12 times per year,
or during SMAP satellite overpass

soil temperature, daily or weekly, with diurnal variation 2 days every
3 months or monitored every 15 minutes

Suggested Sequence of Activities

Read the [Introduction](#).

Read the [Protocols](#) to learn precisely what is to be measured and how.

Choose any [Learning Activities](#) that might support the [Protocols](#).

Make copies of the [Data Sheets](#) in the [Appendix](#).

Perform the [Soil Characterization Protocols](#).

Perform the [Soil Temperature Protocol](#).

Perform the [Gravimetric and Volumetric Soil Moisture Protocol](#).

Perform the [Bulk Density](#), [Soil Particle Density](#), [Particle Size Distribution](#), [Soil pH](#), and [Soil Fertility Protocols](#).

Visit the GLOBE website with your students and review the data
submission pages for Soils.

Submit your data to the GLOBE Student Data Archive using the
Internet or email.



Special Notes

If you choose to dig a soil pit, you may require help with digging. It is also important to obtain permission from your local utility company to make sure that there is not a pipe or wire buried at that location.

Table of Contents



Introduction

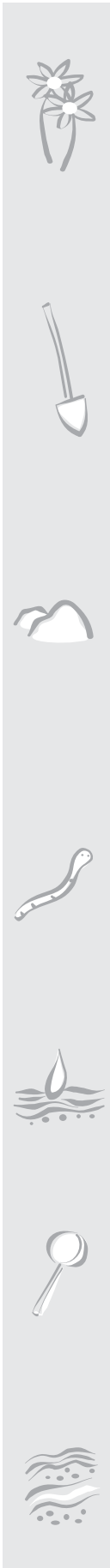
Why Investigate Soils?	Introduction 1
The Big Picture	Introduction 2
GLOBE Measurements.....	Introduction 9
Individual Measurements.....	Introduction 9

Protocols

<u>Selecting, Exposing and Describing a Soil Characterization Site</u>
<u>Soil Characterization Protocol</u>
<u>Soil Temperature Protocol</u>
<u>Gravimetric and Volumetric Soil Moisture Protocol</u>
<u>Bulk Density Protocol</u>
<u>Soil Particle Density Protocol</u>
<u>Particle Size Distribution Protocol</u>
<u>Soil pH Protocol</u>
<u>Soil Fertility Protocol</u>
<u>Digital Multi-Day Max/Min/Current Air and Soil Temperature Protocol</u>
<u>Digital Multi-Day Soil Temperatures Protocol</u>
<u>HOBO® Data Logger Protocol</u>
<u>Soil Moisture Sensor Protocol</u>
<u>Soil Infiltration Protocol</u>
<u>Davis Soil Moisture and Temperature Station Protocol</u>
<u>Frost Tube</u>

Learning Activities

<u>Why do We Study Soil?</u>
<u>Just Passing Through - Beginners</u>
<u>Just Passing Through</u>
<u>Soil and my Backyard</u>
<u>A Field View of Soil - Digging Around</u>
<u>Soils as Sponges: How Much Water Does Soil Hold?</u>
<u>Soil: The Great Decomposer</u>
<u>The Data Game</u>
<u>Soil Makers</u>



Appendix

Site Definition Sheet	Appendix 2
Soil Temperature Data Sheet	Appendix 8
Soil Moisture Data Sheet – SMAP Block Pattern	Appendix 9
Soil Moisture Data Sheet – Star Pattern	Appendix 10
Soil Moisture Data Sheet – Transect Pattern	Appendix 11
Soil Moisture Data Sheet – Depth Profile	Appendix 12
Bulk Density Data Sheet	Appendix 13
Soil Particle Density Data Sheet	Appendix 14
Soil Particle Size Distribution Data Sheet	Appendix 15
Soil pH Data Sheet	Appendix 16
Soil Fertility Data Sheet	Appendix 17
Digital Multi-Day Soil Thermometer Data Sheet	Appendix 18
Daily Soil Moisture Sensor Data Sheet	Appendix 19
Soil Infiltration Data Sheet	Appendix 20
Textural Triangle	Appendix 21
Frost Tube Data Sheet	Appendix 22
Glossary.....	Appendix 23