

Protocols



Selecting, Exposing and Describing a Soil Characterization Site

Students will use a technique chosen by their teacher to expose a soil profile for characterization.

Soil Characterization Protocol

Students will identify horizons in a soil profile, observe the structure, color, consistence, texture, and the presence of rocks, roots, and carbonates of each horizon, and take samples for use in laboratory characterization protocols.

Soil Temperature Protocol

Students will measure near-surface soil temperature frequently near local solar noon and seasonally throughout two diurnal cycles.

Gravimetric Soil Moisture Protocol

Students will measure soil water content by comparing the wet and dry masses of samples.

Bulk Density Protocol

Students will measure the mass of a dry soil sample of known volume.

Soil Particle Density Protocol

Students will measure the volume of a known mass of dry soil particles and calculate their density.

Particle Size Distribution Protocol

Students will suspend a known mass of dry soil in water and measure the specific gravity of the suspension after sand and then silt have settled out of the suspension.

Soil pH Protocol

Students will prepare a one-to-one mixture of dry soil and distilled water and then measure the pH of the liquid left after most of the soil has settled to the bottom of the mixture.

Soil Fertility Protocol

Students will use a GLOBE Soil Fertility Kit to prepare samples and determine whether nitrate, phosphate, and potassium are absent from a soil sample or present in low, medium or high concentrations.

Digital Multi-Day Max/Min/Current Air and Soil Temperature Protocol (see Atmosphere Chapter)

Students will use a digital multi-day maximum/minimum thermometer mounted in their instrument shelter to measure the maximum and minimum air and soil temperatures for up to six previous 24-hour periods.

Optional Digital Multi-Day Soil Temperatures Protocol *

Students will use a second copy of a digital multi-day maximum/minimum thermometer mounted in their instrument shelter to measure the maximum and minimum soil temperatures at 5 cm and 50 cm depths for up to six previous 24-hour periods.

Optional Automated Soil and Air Temperature Monitoring Protocol *

Students will use four temperature probes and a data logger to measure air temperature and soil temperatures at depths of 5 cm, 10 cm, and 50 cm every 15 minutes.

Optional Soil Moisture Sensor Protocol *

Students will develop a calibration curve and use it to determine soil water content at depths of 10 cm, 30 cm, 60 cm, and 90 cm from meter readings of four soil moisture sensor blocks.

Optional Water Infiltration Protocol *

Students will use a dual ring infiltrometer that they can construct from large food container cans to measure the rate at which water soaks into the soil during a roughly 45-minute period.

Optional Davis Soil Moisture and Temperature Station Protocol *

Students install soil moisture sensors and temperature probes and connect them to a Davis Soil Moisture and Temperature Station. Data are logged every 15 minutes and periodically students transfer these data to a computer and report them to GLOBE.

* See the full e-guide version of the *Teacher's Guide* available on the GLOBE Web site and CD-ROM.