MYSTERY #3 | THE SECRET OF SOIL | MIDDLE & HIGH SCHOOL

KANSAS CORN

"Making Soils Fun" Experiments

Compiled by Kim Vinson, NRCS Soil Scientist

Exploding Soil - Take topsoil (soil rich in OM) and hydrogen peroxide; combine. Watch as soil chemistry goes to work in an eruption of carbon dioxide.

Apple of the Earth – Cut apart an apple into sections to learn how little soil is available for food production.

Organic Matter Composition Using Alum (Sponge of the Earth) – Fill a small jar with soil, put in a pinch of alum, fill with water, shake, and watch the organic matter separate from the mineral material.

Estimating the Amount of Crop Residue in a Field – Collect three residue samples from 3ftx3ft areas in a cropped field, weigh them, and multiply your ounces by 100 to get pounds of residue per acre.

What Does Freezing Water Do To Rocks? – Learn how rocks and soil particles are broken down by freezing/ thawing of water by placing charcoal briquettes in bags, one with water, one without. Allow the briquettes to soak, freeze, thaw, and watch for the differences.

Soil Has a Charge – Wrap copper wire around the terminals of a battery, place the wires down into a clay/water slurry and watch to see where the clay particles collect.

Exposing a Rainbow of Colors: Chromatography – Soil holds chemicals with varying degrees of strength as water moves through the soil profile. Demonstrate this by drawing a black line (water-soluble marker) on filter paper and place it in a cup of water to watch the rainbow appear.

Seeing Soil in a Candy Bar – Distribute fun-size candy bars to students and help them identify the "parent materials" represented in the tasty profile. 3 Musketeers is a very young soil (little development of horizons). Snickers has a clay bulge (caramel) and glacial till stone line (peanuts). Kit Kat shows how an alluvial soil is stratified in layers during flood events.

Magnifying Experience – Set out a variety of sizes, shapes, and intensities of magnifying glasses along with soils, rocks, leaves, newsprint, etc. for kids to study. This activity is good at the end of a session because it can fill as much or as little time as you need.

Create Mini Soil Profiles – 1) On an index card write the name of each soil horizon to be represented (A, B, C, R or topsoil, subsoil, parent material, etc.), spread glue next to the name, and then sprinkle with soil material from that horizon. 2) Cut slide-holder pages into columns, label, fill each slide-slot with soil material, and then tape the edge shut with packing tape. 3) Print "soil profile cards" (using handout) on cardstock, attach double-sided carpet tape to the card, place soil on the tape for each horizon.

Erosion Model – Cut the long-side out of two water bottles (so they look like a boat), place soil inside each bottle, cover one with plant residue, "rain" on each bottle, and compare the water that runs off.

Permeability – Take two clear cups, into one pour Rice Krispies clear, into the other pour crushed Rice Krispies. Mix water and food coloring, pour into each cup and see which has the best permeability.

Preferential Flow – Dip floral foam into water, cut at a right angle to the holes, and watch the water.