GYSTC Discover Georgia STEM Camp:
Week Two: Day Three
Title: Soil Classification
Presenter: Lynn Larsen

Purpose:	To determine the type of soil present in your area. Using a soil texture chart, you will determine if you have soil with majority sand, loam or clay.
Standard:	**S3E1. Obtain, evaluate, and communicate information about the physical attributes of rocks and soils** b. Plan and carry out investigations to describe properties (color, texture, capacity to retain water, and ability to support growth of plants) of soils and soil types (sand, clay, loam).
Materials:	Soil samples (access to an area where you are allowed to dig) • Ruler (or be able to estimate depth) • Tap water • Garden trowel or spoon for digging • Teaspoon or medicine dropper • Soil texture flow chart
Procedures:	Topsoil Exploration: 1. Put approximately 25 grams (a handful, see photo) of soil from the topsoil outside. Topsoil is the first 5 centimeters. 2. Knead the soil to break up any larger pieces. Add water, drops at a time, to help break down aggregates. 3. Continue this process until the soil is plastic and moldable, like moist putty. Use the Soil Texture Flow Chart to deduce your topsoil composition. (See attachment) Subsoil Exploration: 1. Dig into the subsoil to gain another sample. Subsoil is near 50 cm. Digging between 30-50 cm will suffice. 2. Procure approximately a 25-gram sample of subsoil. 3. Add water, drops at a time, and knead the soil to break down any aggregates. Continue this process until the soil is plastic and moldable, like moist putty. Use the Soil Texture Flow Chart to deduce your subsoil composition (See attachment)
Science Behind It:	There are many soil properties that help us describe and manage soils. Some of the important physical properties are described below. **Soil Texture**

	The particles that make up soil are categorized into three groups by size – sand, silt, and clay. Sand particles are the largest and clay particles the smallest. Most soils are a combination of the three. The relative percentages of sand, silt, and clay are what give soil its texture. A clay loam texture soil, for example, has nearly equal parts of sand, slit, and clay. Sand – 2.0 to 0.05 mm Silt – 0.05 to 0.002 mm Clay – less than 0.002 mm
	There are 12 soil textural classes represented on the soil texture triangle on the right. This triangle is used so that terms like "clay" or "loam" always have the same meaning. Each texture corresponds to specific percentages of sand, silt, or clay. Knowing the texture helps us manage the soil.
	Soil Structure Soil structure is the arrangement of soil particles into small clumps, called peds or aggregates. Soil particles (sand, silt, clay and even organic matter) bind together to form peds. Depending on the composition and on the conditions in which the peds formed (getting wet and drying out, or freezing and thawing, foot traffic, farming, etc.), the ped has a specific shape. They could be granular (like gardening soil), blocky, columnar, platy, massive (like modeling clay) or single-grained (like beach sand). Structure correlates to the pore space in the soil which influences root growth and air and water movement
	Soil Color Soil color is influenced primarily by soil mineralogy – telling us what is in a specific soil. Soils high in iron are deep orange-brown to yellowish-brown. Those soils that are high in organic matter are dark brown or black. Color can also tell us how a soil "behaves" – a soil that drains well is brightly colored and one that is often wet and soggy will have a mottled pattern of grays, reds, and yellows.
	Soil Profile There are different types of soil, each with its own set of characteristics. Dig down deep into any soil, and you'll see that it is made of layers, or horizons (O, A, E, B, C, R). Put the horizons together, and they form a soil profile. Like a biography, each profile tells a story about the life of a soil. Most soils have three major horizons (A, B, C) and some have an organic horizon (O).
Questions to Ask:	What is a soil profile? What is the difference between sand, clay, and loam? What type of soil do you have in your area?