**5E Template- Science**

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| **Name: Danny Cole** | **Date: 7/17/2011** |
| **Content Area: Earth Science** | **Grade Level(s): 7-9 (works well with special needs students)** | **Topic(s): Soil particles and textures.** |

**Standards (SOL)**

ES.1 The student will plan and conduct investigations in which

ES.9 The student will investigate and understand how fresh water resources are influenced by geologic processes and the activities of humans. Key concepts include

1. processes of soil development;

**Objectives (UKD’s)**

To identify the amounts of soil particles that make up the texture of soils, and how different minerals change the layer.

**Materials & Resources**

 *Jar, soil(from different locations), water, permanent marker, spade or some type of digging items*

**Safety Considerations**

 *When dealing with glass jars, always be aware of the potential to drop and break.*

**Engage – Time Estimate \_\_\_5 minutes\_\_\_\_\_**

 *Allow students to go outside, pick an area and begin playing in the dirt..*

**Explore – Time Estimate \_\_10 minutes\_\_\_\_\_\_**

Have students break into groups of two or four. Have students pick the area that they wish to get a soil sample. Students need to did down about six inches in their selected site. Have them place the soil in the jar and ask them to decribe in writing what they see and what they think their sample is (clay, sand, silt, etc.). The jar should be at least half full of the soil sample but not more than ¾ full. Have students fill the remaining jar with water, making sure to fill it up. Have students shake the jar real well until all clumps etc. seem to have broken apart. Allow the jar to sit for one minute(could take longer depending on sample). Have students mark a line at the top where the soil has settled. Allow students to write down all observations at this point. Allow the jar to settle overnight with disturbing. At the beginning of the next days class, have students mark the different layers that are evident by looking closely. Not on board or explain that any particles floating are much light and less dense than the rest, this is called organic matter and will float in the water. Observe with them that the next layer will be clay, which is the smallest and lightest particles. The middle layer will be silt, and the bottom, sand. Have the class decide as a group then again as a class of which layer is the thickest. Also, have the students graph in centimeters the different heights of the layers.

**Explain -- Time Estimate \_\_5 minutes\_\_\_\_\_\_**

 *Explain to the students that though they originally saw mainly one type or color of soil/dirt, that soil consist of different types of minerals/particles.*

**Extend -- Time Estimate \_\_10 minutes\_\_\_\_\_\_**

 *After all observations are noted, have students place different types of rocks in the jar and determine how this affects the make-up and layering of the soils and how some jars with more consistency may have more or less trouble with drainage etc.*

**Evaluate -- Time Estimate \_\_\_5 minutes\_\_\_\_\_**

*Have all students draw what their jar looks like with the labels and layers notes. Students can color the different layers to help them identify the layers.*

**Plans for Diversity**

 *Depending on the nature of the disability, special needs students may need assistance with a scribe and or could benefit with a sheet of paper with the picture of the jar and layer spaces provided. Have them attempt to fill in the blanks with the words provided in a word bank format.*

**Connections**

 *This lesson begins to allow the students to realize that our earth has many different layers in the ground. It takes the soil layer to even a small break down of the different layers but allows the students to begin to visualize the though we cant dig through all the different layers of the earth in a school lab, the layers of the soil are very much similar to the different core layers of the earth.*