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| **Section of Project** | **6th Grade Science: Plant + Soil Unit #3** |
| **Title** | *Erosion Bottles (LAB)* |
| **Introduction** | The purpose of this project (Cotton: From Dirt to Shirt) is two fold:   1. To show show the cycle of connectedness from science to economics, through use of Math and Language Arts. 2. To utilize cotton as a catalyst for comparison and discussion in all aspects of this project.   We understand that schools cannot solely devote their time to one crop for their source of material and discussion. We do recognize the importance of comparing crops through specific science units. Cotton is a versatile crop with a dynamic endurance to both natural change and economic change.  The purpose of this project is not to develop “extension lessons”, but rather to help students engage deeper into understanding of content already outlined in the NC Public School Systems. You will note that all of these activities and lessons are meant to partner with lessons you may have already created for your classroom. The best way to read these lessons is thru the lens of the lessons you have already created. How can you take portions, or all of what we have to offer here, and establish it into your lessons already made??  \*NOTE: Anything with the word “LAB” in the title signifies that this activity will take up a large(r) portion of class time than other activities. |
| **Cotton Connection** | Cotton producers seek to minimize soil erosion, due to the sensitivity that cotton can experience, most especially with the brittle and delicate stems that create the shoot of the cotton plant.  Knowing how brittle the shoots can be, allow students to research and hypothesize what types of erosion affect the cotton plant the most. Have students explain in their answers.  Further things to know:   * Conservation tillage - covering the soil in crop residue year-round * Land Terracing - sloping the land to prevent washing away of topsoil |

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| **Curriculum Alignment** | * 6.E.2.4 Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship. |
| **Learning Outcomes** | Participants will express their understanding of erosion through observation  Participants will deepen their understanding of erosion through creation |
| **Time Required and Location** | One 50-minute class period |

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| **Materials Needed** | **FACILITATOR LIST**  ***NOTE: THIS ACTIVITY WILL REQUIRE YOU TO PRE-PLAN WELL IN ADVANCE. YOU WILL NEED ENOUGH SODA BOTTLES FOR EACH STUDENT, PLUS THE BOTTOM OF A SECOND BOTTLE. ENCOURAGE STUDENTS TO BRING SOME IN, BUT YOU MAY NEED TO REACH OUT TO OTHER GROUPS TO HELP YOU OBTAIN MATERIALS.***  ***NOTE: THIS ACTIVITY WILL BE ONE TO REVISIT OVER TIME, AS SEEDLINGS NEED TIME TO DEVELOP AND SPROUT.***  ***NOTE: YOU MAY NEED TO PARTNER PEOPLE UP IN GROUPS OF 2-3, DUE TO YOUR LIMITATIONS. GROUPS SHOULD BE NO LARGER THAN 3 FOR THIS ACTIVITY.***   * 1, 16 oz. soda bottle with bottom still attached * Bottom of 1, 16.oz soda bottle * String * Planting soil * Organic debris (e.g.: twigs, leaves) * Water * Direct sunlight * Scissors * Table (potentially) * Permanent Marker, or Tape and a marker (for labeling) * Cotton seeds * Hole puncher or something sharp to poke holes through plastic bottle   **PARTICIPANT NEEDS**   * 1, 16 oz. soda bottle (in tact) * Bottom of 1, 16 oz. soda bottle * 20” of string (to start with) * Enough soil to fill all three bottles ⅗ to the top * Scissors * Marker to put name on bottles * Seeds (3-4 per student) |
| **Safety** | * You will want to remind students about safety with scissors, especially on this activity. * Explain to students being careful with cut plastic, such as the bottles. If cut with sharp ends, they have the potential to provide cuts on their hands. |
| **Participant Prior Knowledge** | As previously discussed, these activities are meant to latch onto what you are already teaching in the classroom. This activity should coincide with your already required section and introduction of soil. |
| **Facilitator Preparations** | Be familiar with all terms (mentioned in “Critical Vocabulary” section) and their definitions.  See two notes above in “Materials” section. |
| **Activities** | *In these lessons, these activities are built as add-ons and expansions of lessons you should already be teaching in your curriculum. We will be expressing the outline of the activity only. Please make certain that the activity you are performing matches the lesson of the unit you are teaching*.  ***THIS ENTIRE ACTIVITY WILL LIKELY REQUIRE ONE FULL CLASS PERIOD OF AT LEAST 45 MINUTES.***   1. Have students take each soda bottle and cut it in half horizontally, starting at the bottom and getting as close to the top as possible, without cutting off the lid itself 2. With the second bottle, have students measure up 5” from the bottom, and cut off the bottom. 3. *THE TEACHER WILL GO AROUND AND POKE TWO HOLES ON EACH SIDE OF THE CUT OFF BOTTOM FOR EACH STUDENT.* 4. Take the string, and tie each end into the holes of the bottom cut out.    1. If it needs to be shortened, students may gauge for themselves 5. In each bottle, students should label their bottles with their names, prior to moving on from this step. 6. Students should fill each open water bottle ¾ full with soil. No need to compact. 7. In one bottle, students should take half of the seeds they were given and plant them in the soil. Make sure they space them out, and do not plant them directly on top of each other. 8. In the second bottle, have students place organic debris on top of the soil creating a light covering. 9. In the third bottle, have students leave only soil visible. 10. Take the cut bottoms with the strings attached and place each of them on the bottles with the soil in them. 11. Take the bottles and place them on a table that is sitting in direct sunlight. 12. Once there are in the planted bottles have begun to rise and are growing healthy, have students fill a pouring container with two cups water. 13. Each plastic bottle will need two cups of water for this experiment. 14. Students should pour the two cups of water into each bottle and observe what happens to the water as it trickles out. |
| **Assessment** | 1. In between the time of waiting for the seeds to grow, have students use their previous observations and hypothesize what they think will happen. Explain that the water will be poured on top of each bottle of soil. Have students draw out their hypothesis in their Science Journals, or on pieces of paper. When this activity is revisited in several days, students can look at their hypothesis and compare with what actually occurred and dictate the differences. |

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| **Critical Vocabulary** | * Erosion * Organic debris * Runoff |

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| **References** | National Cotton Council of America. *Cotton: From Field to Fabric*. National Cotton Council of America. Memphis: n.d. Print. |
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