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| **Section of Project** | **6th Grade Science: Plant + Soil Unit #3** |
| **Title** | *Plant Study* |
| **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** | There are 3 principal groups of cotton:   1. *Gossypium hirsutum,* also called *American Upland* (native to Mexico and Central America); accounts for more than 95% of US production. 2. *G. barbdense,* also called *American Pima* (native to South America) 3. *G. herbaceum* and *G. arboreum* (native to India and Eastern India)   Cotton seeds, unlike many other seeds, have a poisonous layer that surrounds the seed known as *Gosypol*.  Unlike many other plants during the growth stage, the roots of the cotton plant grow more extensively than the shoot. This development allows for the cotton plant to become more drought-tolerant.  Students will probably recognize that their cotton plants are exhibiting faster, or firmer growth, than some of the other plants they may have initiated into the soil. Allow students to observe the differences and to hypothesize on why these differences exist. |

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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 the process of the plant life cycle through observation  Participants will deepen their understanding of the process of the plant life cycle through hands-on experimenting  Participants will express their understanding of the process of the plant life cycle through daily journal entries |
| **Time Required and Location** | *This particular activity is built to last several days and does not take an entire period. However, it should correlate with the lessons you have already created around the life of a plant.* |

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| **Materials Needed** | **FACILITATOR LIST**  ***NOTE: THIS ACTIVITY WILL REQUIRE YOU TO LOCATE SPOTS IN YOUR CLASS OR OUTSIDE OF YOUR CLASS TO PERFORM THE REQUIREMENTS. THERE ARE NUMEROUS WAYS YOU MAY ACCOMPLISH THIS, AND YOU WILL HAVE TO ASSESS YOUR RESOURCES AVAILABLE TO YOU TO DETERMINE WHAT WILL SUIT YOUR STUDENTS BEST. THE FOLLOWING ARE OPTIONS YOU CAN CONSIDER:***   1. ***GARDEN BEDS*** 2. ***POTS*** 3. ***MILK JUGS*** 4. ***PLASTIC PLANTERS***   ***YOU WILL NEED TO MAKE SURE THAT NO MATTER WHAT, YOU HAVE ENOUGH DIRECT SUNLIGHT FOR THE SEEDS TO GROW, OR HAVE A PLANT STAND with INDOOR UV LIGHT ATTACHED.***  In this activity, you will want to provide 3-4 different types of seeds to be planted within each class. It can be the same 3-4 seeds for all of your class sections you teach.  *There are two ways of going about this second process: technology or paper/color pencils. If your school is unable to provide adequate technology access or your students are unable to participate in a BYOD, then using paper/color pencils will suffice for the remainder of the activity.* |
| **Safety** | * When planting cotton seeds, you will need to make sure that students wear gloves when handling, or that they wash their hands thoroughly as the Gosypol on the outside of the cotton seed can be dangerous if consumed. * Double check with each student about their allergies. |
| **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.  You may approach this particular lesson *while* teaching students about these concepts, OR you may choose to do this *after* you have taught the foundational knowledge. |
| **Facilitator Preparations** | Be familiar with all terms (mentioned in “Critical Vocabulary” section) and their definitions. |
| **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 VARY ON ITS LENGTH BASED ON HOW QUICKLY THE PLANTS GROW. IT IS SAFE TO ASSUME THAT THIS ASSIGNMENT WILL TAKE AT LEAST 1 MONTH, AT MINIMUM.***   1. After you have decided how students will plant their seeds, have students plant their seeds into the soil. 2. Students should document every three days the growth of their seedlings and the subsequent reactions that are occurring. Documentation should happen one of two ways:    1. *Technology -* students use technology devices to help them document the changes by capturing images/pictures on the device. These images should then be placed on a subsequent document, either printed out or on a journal keeping tech app (ex: Google Docs)    2. *Paper/Color Pencils* - students should trace out a general sketch, with specific details using their paper journal and color pencils. They should be using proper colors for specific parts. (Ex.: if the sprout of the seed includes two small leaves, they should trace this out. If those leaves are yellow, so should their drawing). 3. Students should document in their journals any specific changes that they have done to or for their seed (i.e.: added water, moved locations, added decomposing material) 4. Have students mark out in several sentences what they are observing, using appropriate vocabulary and terminology to emphasize what is happening in the cycle. 5. Have students end their journal entries by hypothesizing what they anticipate seeing next with their seedling. They should also briefly explain why they feel that they will see this. |

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| **Critical Vocabulary** | * Seedling * Germination * Pollination * Seed coat * Sprout * Fertilization * Pollen * Cotyledon * Epicotyl * Hypocotyl * Cotton Boll |

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| **References** | Cotton Inc. “The Cotton Field Notebook.” Cotton University. Cotton Inc. 2013. Print. |
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