Unit Title: Makergarden UBD
Subject/Course: SPECCIT/Maker project for After-School Gr. 6-8

Designer(s): Schied

Stage 1- Desired Results

NGELA Standards:
NGMATH Standards
CSDF Standards
AASL Standards: 1-4

Enduring Understandings: **Participants will understand that…**	**Essential Questions:** **Participants will explore…**
Technology exists to make life easier. Technology can have both positive and negative effects on the world. The inquiry model allows people to figure out how to use technology effectively. Digital and information literacy requires both cognitive and technical skills.	How can we use this technology to improve our lives? How do we use this technology in a positive way while minimizing any negative impacts? What is the best use of this technology? What skills do we need to develop in order to use this technology effectively?
Participants will know (Content)…	**Participants will be able to (Skills) …**
The steps of the inquiry process The question formulation technique How to use a grow tower How to conduct an experiment How to record data How to draw conclusions and present them with supporting evidence How to work collaboratively How to write reports and create presentations How to locate relevant information Criteria for evaluating sources of information Career possibilities related to this project	Determine avenues of inquiry Act, assess, and adjust to improve their outcomes Evaluate sources of information Give credit to sources of information Develop inquiry questions Use the grow tower Create and carry out experiments Record and analyze data to draw conclusions Present conclusions in person and on paper Use technology ethically and responsibly Work productively and collaboratively with others Reflect on the inquiry process and their personal growth

Stage 2- Assessment Evidence

Performance Tasks:	**Other Evidence:**
Set up and use grow tower Experiment proposals and reports Presentation of conclusions from data	Data records Student reflection journals

Stage 3- Learning Plan

Lessons:	**Materials:**
CAVEAT: This set of lessons is intended to give teachers a detailed outline of the initial inquiry process, which would take place at the beginning of the project. However, the actual inquiry question and subsequent inquiries and experiments are intended to be student-determined and led, depending on the outcomes of the data and the designated purpose the grow group decides upon. So while the process will be repeated over and over, either in portions or in full, the content may vary widely from group to group, as no group of students will interact with the technology in the same way as another group. Pre-Inquiry Lessons: Teacher will start off by facilitating the creation of a project contract, explaining that students will need to work together to achieve a common goal, and asking for what behaviors would look like in order to reach their goal. Students would need to sign off on the contract in order to continue with the project, and if there is any violation of the contract in the future, that would be grounds for holding a restorative circle to repair the contract, or the student would be asked to leave the project, but would be able to participate in any stand-alone extension activities which are open to the whole school. Teacher will explain that a critical part of the inquiry process is constant reflection. Unless students recognize what happened and what part of what happened was ineffective, they cannot make changes to improve outcomes. Therefore, students will keep an observation and reflection journal to track the progress of the project and their growth. Teacher will facilitate discussion and decision-making as to what components should be present in the journal. The last component of teacher facilitation prior to engaging in the inquiry process would be an investigation into student strengths. Different people on the team have different strengths, so when tasks need to be divided up in order to make sure the grow tower and the project are operating effectively, it might be helpful, but not absolutely necessary, for students to draw on their strengths before committing to specific tasks.	Grow tower (preferably 2, one control/one experimental) Grow pods and seeds Water and plant food Method of recording data (determined by group) Method of presenting conclusions (determined by group/individuals) Method of recording reflections (determined by individuals) Other materials as needed, depending on course of project

Inquiry Lessons: (Teacher/Students will keep a running record of vocabulary that is unknown and/or learned throughout the project.) QFT: Students will complete QFT (question-formulation technique) process to determine which questions require immediate priority in answering. This will most likely revolve around how the tower works, and what parameters are needed to have it be fully functional. Students will set up grow tower according to determined parameters. If needed, students can access relevant print or digital information related to how to set up a grow tower. Before using a source, teacher will ask how students know they can trust the source. This will be an informal discussion. Once tower is set up, students will determine an authentic reason to use the tower, possibly by revisiting other questions from initial qft or by conducting a new round of question generation. Students will pick a line of inquiry from the generated questions and explain why they think it would be the best use of the technology. Unless there is an initial consensus as to the inquiry direction after the first go-round, the teacher may ask the students for supporting information to explain their point. If needed, students will debate their opinion as to the direction of inquiry, using the gathered evidence as to which would be the best use of the tower. Group will engage in snowball protocol if needed to reach consensus, with teacher noting that the non-chosen ones would be eligible down the road for a future project. Once project has been selected, students will determine which data needs to be recorded in border to be able to make a decision at the end of the project and how it should be organized. Students will record data in appropriate program/format. Then students will analyze the data and draw conclusions, specifically noting evidence that supports their claim. Teacher will lead discussions on fact vs. opinion and perspective/bias before students		

begin creating their presentations. Teacher will also facilitate discussion as to what criteria needs to be included in the presentation, as well as outline how to write the accompanying report (suggested to have separate teams responsible for presentation and report). Students will work on constructing presentations/reports. Students may determine that data is missing or incomplete, and other students may share their data to gain a more complete picture. Within their products, students will credit any referenced secondary sources as well as the data provided by others, if applicable. When students determine they are prepared, they will present their conclusions to their intended audiences. If requested, students may be asked to supplement and/or refine their data to address specific questions. Teacher and students will repeat above process as time allows, pursuing follow-up investigations and/or experiments. As appropriate, teacher will guide discussions about the broader implications of the technology to spark student inquiries. At the end of the year, students will engage in the creation of a reflection artifact to be presented to appropriate parties, which may include peerage, teachers, parents, administration, and/or board of education. Students will also consider how this project might provide them with possible career directions. Modifications: Work in pairs, play to strengths, ask students what they want Extensions: 1-and-done after-school programs on specific interdisciplinary topics. Could include: Meal planning/cooking/nutrition Hydroponics 101 How plants grow Statistics crash course History of herbs Botanical drawings	

Makergarden Project Mapping.xlsx