9th – 12th Problem-Based Learning

Essential Question:
Spatial Grow uses a hydroponic system to grow fruits and vegetables. Each unit has a space that holds the "brain" of the hydroponic system and must be designed for maximum efficiency. Redesign the case, taking into consideration weight, heat distribution, and holes for wiring. Since our students attend a virtual school, STEM days are done on the 2nd and 4th Fridays of the month. Attendance is mandatory but it can vary. Approximately 23% of our 6-8 students attend.

Standards & Alignment	
Science/Social Studies (Sc) EVSC.ETS2.1: Engage in argument from evidence on the role engineering and technology play in a sustainable human society. Students are exploring the technology behind hydroponics to redesign the case. They will be able to draw conclusions on the benefits of hydroponics as an alternate means of growing crops and influencing a more sustainable society. *This PBL also addresses the state's Science and Engineering Practices #1-6 and Crosscutting Concepts #3-4.	***Math*** A1.N.Q.A.1 Use units as a way to understand real-world problems.* a. Choose and interpret the scale and the origin in graphs and data displays,* A1.A.REI.A.1 Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method.

ELA	***Computer Science***
11-12 :9-10.**SL.CC.1** Initiate and participate effectively with varied partners in a range of collaborative discussions on appropriate 9th- 10th 11-12 grade topics, texts, and issues, building on others' ideas and expressing one's own ideas clearly and persuasively. 11-12: 9-10 .**SL.PKI.4** Present information, findings, and supporting evidence, conveying a clear and distinct perspective so that listeners can follow the line of reasoning; address	CS.AT: Algorithmic Thinking 3) Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests. 4) Use effective communication and accurate computer science terminology to explain problem solving when completing a task. Students are creating a mock prototype to solve the problem of an ineffective design of a case holding

alternative or opposing perspectives; and organize and develop substance and style appropriate to task, purpose, and audience. 11-12: 9-10.**W.PDW.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 11-12: 9- 10 **L.CSE.1** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking; consider complex and contested matters of usage and convention.	the brain of a hydroponics smart system. They will communicate with each other and the community partner to explain the steps they are taking to solve the problem.