MONDAY:

1) Introduction to Sumobots
2) Robot Parts
3) Introduction to LEGO Spike Prime
4) Engineering Design Process
5) Engineering Notebooks
6) Minimum Viable Product
7) Designing a Robot and Design Ideas
8) Engineering Concepts

Subject: STEAM, Computer Science	**Topic or Unit of Study:** Engineering Design Process, Building Robots, Programming Robots, Computer Programming (test and refine programs)
Objectives: ● We will understand the elements of the SumoBots competition. ● We will learn parts of the robot and their purposes. ● We will utilize the LEGO Spike Prime App. ● We will identify the steps of the Engineering Design Process and use Engineering Notebooks to document our progress through it. ● We will use the Minimum Viable Product in our initial designs. ● We will use engineering concepts to continue through the Engineering Design Process.	**Standards:** **HS-ETS1-1:** Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. **HS-ETS1-2:** Design a solution to a real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. **HS-ETS1-3:** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, aesthetics as well as possible social, cultural, and environmental impacts. **12.AP.A.04:** Analyze and refine classic algorithms to solve problems. **12.AP.A.05:** Evaluate algorithms (e.g., searching, sorting) in terms of their efficiency, correctness, and clarity. **12.AP.PD.06:** Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality). **A.CED.A.1:** Create equations and inequalities in one variable and use them to solve problems.
Synopsis: Students will design, build, and program SumoBots that navigate and battle in a fun competition format with other robot teams. SumoBots are small autonomous robots that use sensors to detect each other. In “battle”, they “fight” to push the opponent robot out of a competition ring.	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Teacher computer with access to internet and teacher presentation ● LEGO Spike Prime kit (one per two students) ● SumoBots competition field

TUESDAY:

1) Sumobot Rules **2)What is a Prototype?**
3) Available Upgrades **4) Programming**
5) Navigating the Professional World **6) Robotics Shark Tank Activity**

Subject: STEAM, Computer Science	**Topic or Unit of Study:** Engineering Design Process, Building Robots, Programming Robots, Computer Programming (test and refine programs)
Objectives: ● We will define a prototype. ● We will discuss available upgrades for Sumobot designs. ● We will begin programming our Sumobots using Python coding. ● We will discuss ways students can prepare for and navigate the professional world. ● We will use the Engineering Design Process to create solutions to everyday problems.	**Standards:** **HS-ETS1-1:** Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. **HS-ETS1-2:** Design a solution to a real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. **HS-ETS1-3:** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, aesthetics as well as possible social, cultural, and environmental impacts. **10.AP.A.01:** Develop prototypes that use algorithms (e.g., sequencing, selection, iteration, recursion, etc.) to solve computational problems by leveraging prior student knowledge and personal interest. **12.AP.A.04:** Analyze and refine classic algorithms to solve problems. **12.AP.PD.06:** Modify an existing program to add additional functionality and discuss intended and unintended implications.
Synopsis: Students will design, build, and program SumoBots that navigate and battle in a fun competition format with other robot teams. SumoBots are small autonomous robots that use sensors to detect each other. In “battle”, they “fight” to push the opponent robot out of a competition ring.	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Student computers ● LEGO Spike Prime kit (one per two students) ● SumoBots competition field ● Extra LEGO parts (motors, wheels, sensors, building pieces) ● Budgeting worksheet (electronic) ● Teacher copy of shark tank activity description ● Seven post-it notes or index cards per student ● Copies of Shark Tank EDP worksheet

WEDNESDAY:

1) Poster and Presentation Skills
2) Interviews, Resumes, and Cover Letters
3) Programming (review if needed)

Subject: STEAM, Computer Science	**Topic or Unit of Study:** Engineering Design Process, Building Robots, Programming Robots, Computer Programming (test and refine programs), Collaboration, Presentation/Communication
Objectives: ● We will create a poster that summarizes our research. ● We will discuss elements of an effective presentation.. ● We will outline important elements of a resume. ● We will compile the basics of a resume for customization. ● We will discuss ways students can tailor resumes to job announcements. ● We will discuss tips for job interviews. ● We will outline elements of a cover letter. ● We will brainstorm lists of possible professional references. ● We will review important elements of programming Sumobots.	**Standards:** **HS-ETS1-2:** Design a solution to a real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. **HS-ETS1-3:** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, aesthetics as well as possible social, cultural, and environmental impacts. **W.11-12.1:** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. **W9-12.2:** Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. **SL9-12.4:** Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
Synopsis: Students will design, build, and program SumoBots that navigate and battle in a fun competition format with other robot teams. SumoBots are small autonomous robots that use sensors to detect each other. In “battle”, they “fight” to push the opponent robot out of a competition ring.	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Student computers ● LEGO Spike Prime kit (one per two students) ● SumoBots competition field ● Extra LEGO parts (motors, wheels, sensors, building pieces) ● Poster paper ● Lined paper