GRADE 4– Unit 2 Engineering and Design - Robot Arm

Mission Statement
The primary goal of the Swedesboro-Woolwich School District is to prepare each student with the real life skills needed to compete in a highly competitive global economy. This will be achieved by providing a comprehensive curriculum, the integration of technology, and the professional services of a competent and dedicated faculty, administration, and support staff. Guiding this mission will be Federal mandates, including No Child Left Behind, the New Jersey Core Curriculum Content Standards, and local initiatives addressing the individual needs of our students as determined by the Board of Education. The diverse resources of the school district, which includes a caring PTO and active adult community, contribute to a quality school system. They serve an integral role in supporting positive learning experiences that motivate, challenge and inspire children to learn.

Unit/Module Overview
In unit 2, students will learn to: ● utilize the design process to engineer, design and test a robot arm that can perform a specific task.

Standards Covered in Current Unit/Module
Related Standards and Learning Goals
CS.3-5.8.2.5.ED.3 - Identify potential solutions for simple hardware and software problems using common troubleshooting strategies. **CS.3-5.8.2.5.ED.2 -** Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

Unit/Module Weekly Learning Activities and Pacing Guide			
Topic & # Days	**NJ Standards**	**Critical Knowledge & Skills**	**Possible Resources & Activities**
The Design Process (1)	• **CS.3-5.8.2.5.ED.2**	**Obj. We are learning to**: design and create a prototype. **Suggested Formative Assessment(s)**: • The Design Process Quiz1	• Activity ○ Design Process Review • Video ○ Kid Engineer: Bike Trailer | Design Squa… • Materials ○ Growth or Fixed Activity 1 ○ Kahoot!
Introduction to Robot Arms (1)	• **CS.3-5.8.2.5.ED.2**	**Obj. We are learning to**: • create a prototype sketch of a robot arm in cooperation with a peer. **Suggested Formative Assessment(s)**: • Arm Prototype sketch	• Activity ○ Robot Arm Introduction ■ Follow the design process to brainstorm and create a sketch (with a partner) • Video ○ Mission: Solar System - Robo Arm | Des… ○ Difference between 1st, 2nd, and 3rd cl… • Materials ○ Paper ○ Ruler ○ Pencil ○ Eraser
Robot Arm Design and Construction (5)	• **CS.3-5.8.2.5.ED.3**	**Obj. We are learning to**: • create a basic robot arm by utilizing the design process. **Suggested Summative Assessment(s)**: • Scale Tracking Sheet Gr 4 Unit 2 • Robot Arm Rubric	• Activity ○ Create a final copy of a working robot arm • Materials ○ Materials for Arm.png
Robot Arm Testing / Conclusion (1)	• **CS.3-5.8.2.5.ED.3**	**Obj. We are learning to**: • express in writing how each step of the design process was utilized in the creation of their arm. **Suggested Formative Assessment(s)**: • Robot Arm Design Process	• Activity ○ Cup passing game ○ Robot arm design process reflection • Materials ○ Cup for testing arm ○ Robot Arm Design Process Google Doc

Link to Additional Components including Cross Curricular Connections, Accommodations, Assessments, Etc

ELA Enduring Understanding Statements