

Course Title:	Technology Education
Grade(s):	7th grade

Course Description
In this course, students will: • Build on a basic 6th grade introduction to manufacturing, covering both additive and subtractive manufacturing. • Be introduced to safety, tool recognition, measuring to the nearest 1/16", and construction math. • Review computer science terminology for effective program development in coding. Terminology reviewed will include: sequencing, loops, conditionals, and functions. • Begin a robotics introduction, following multi-step procedures to build a robot claw and test with remote/autonomous driving. This course meets daily for a quarter (approximately 45 class periods). Each class period is 45 minutes.
Approved Curricular Materials/Textbook(s)
Cloud-based development through instruction and Google Classroom for organizational skills

Unit Title	Unit Description (Include Unit Objectives)	Unit Pacing
Intro Day	Learning Target: • Students will receive an introduction to the class content for this quarter • Students will review safety information for emergency responses as needed • Students will login to computers, ensure Google Classroom is connected to course and student, and review onshape.com account setup for first unit	1 class
Unit 1: Additive Manufacturing	Learning Target: • Students will determine a need and design a solution for hanging a wall art creation • Students will apply CAD knowledge and design for manufacturing their own picture frame/wall hanging bracket to hang on a wall	4 class periods

Unit 2: Safety and Measuring	Learning Target: - Students will receive a tour of the wood working area: - Introduce equipment terminology & locations - Introduce safety rules, which will continue to be discussed daily - Safety quiz administered as a record of safety training - Safety lessons given on equipment as introduced and needed - Students will be introduced to imperial measurement and will practice measuring to the nearest 1/16 inch	2 class periods
Unit 3: Measuring - American Flag	Learning Target: - Students will demonstrate knowledge of safety - Students will use hand tools and create an American Flag with subtractive manufacturing - Students will be given a safety lesson on hand tools & power tools as introduced and demonstrated for safe use - Students will utilize creativity for color patterns and design - Students will demonstrate attention to detail & precision in measuring while creating this project - Students will utilize computerized design equipment such as CNC router or laser etching equipment	8-10 class periods
Unit 4: Joinery - Picture Frame	Learning Target: - Students will be given a safety lesson on equipment and demonstrate safe use - Students will create a picture frame from wood raw stock - Students will demonstrate proficiency in woodworking hand tools, tape measure, hand saw, back saw, coping saw, square - Students will demonstrate proficiency in power tool use of drill press - Students will understand basic wood joinery - Students will use a hammer and joinery miter box to cut a 45 degree angle	6 class periods
Unit 5: Computer Science	Learning Target: - Students will develop sequential algorithms - Students will stack code blocks together in a linear sequence, making them move straight, turn left, or turn right	6 class periods

	• Students will apply degrees of a circle for accurate right and left turns • Students will define “sprite” as a character or object on the screen that can be moved and changed • Students will create new sprites and assign them behaviors • Students will identify the benefits of using a loop structure instead of manual repetition • Students will break down a long sequence of instructions into the largest repeatable sequence • Students will employ a combination of sequential and looped commands to reach the end of a maze • Students will define circumstances when certain parts of a program should run and when they shouldn't • Students will determine whether a conditional is met based on criteria • Students will nest conditionals to analyze multiple value conditions using if, else if, else logic • Students will pair a loop and conditional statement together • Students will recognize when a function could help to simplify a program • Students will use predetermined functions to complete commonly repeated tasks	
Unit 6: Robotics Introduction	Learning Target: • Students will apply physics terms in 8th grade science at an introductory level to the connection of our robots • Students will demonstrate knowledge of terms learned through application in robot movements • Students will follow multi-step procedures in building a robot claw	6 class periods
Unit 7: Robot Movements	Learning Target: • Students will pair robots with a remote, attach a battery to the robot brain, and learn the drive, lift, and claw components • Students will demonstrate mechanical advantage through their robot lifting a block, friction, center of gravity, and other physics terms through robot movement • Students will program the robots with prior computer science knowledge to drive autonomously	6 class periods