

CURRICULUM

Engineering Applications

Thomas Jefferson High School

Curriculum Strand: *Research and Development*

PA Academic Standards Student must be able to do	Objective Content or process student will be able to know and do	Instructional Methods	Materials/ Resources Textbooks, workbooks, software, hardware, etc	*Assessment Procedures *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	*Additional Learning Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	*Extended Learning Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.2.10 D Identify and apply the technological design process to solve problems. 3.6.10 C Apply physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems. 3.7.10 C Apply basic computer operations and concepts. 3.7.10 D Utilize computer software to solve specific problems. 3.8.10 A Analyze the relationship between societal demands and scientific and technological enterprises.	<ul style="list-style-type: none"> • Identify a real-world engineering design problem to be solved • Research background and possible solutions for the problem • Brainstorm and sketch possible solutions to the problem • Design a solution using a CAD software 	<ul style="list-style-type: none"> • Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video 	<ul style="list-style-type: none"> • Calculators • Measuring Devices • Computer • AutoCAD • CAM Software • CNC Equipment 	<ul style="list-style-type: none"> • Teacher Observation • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A 	<ul style="list-style-type: none"> • Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction 	<ul style="list-style-type: none"> • Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

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Curriculum Strand: Working Model

PA Academic Standards Student must be able to do	Objective Content or process student will be able to know and do	Instructional Methods	Materials/ Resources Textbooks, workbooks, software, hardware, etc	*Assessment Procedures *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	*Additional Learning Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	*Extended Learning Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.2.10 D Identify and apply the technological design process to solve problems. 3.6.10 C Apply physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems. 3.7.12 A Apply advanced tools, materials and techniques to answer complex questions. 3.7.10 B Apply appropriate instruments and apparatus to examine a variety of objects and processes.	<ul style="list-style-type: none"> • Apply tools and materials to produce a working model of the solution • Evaluate the effectiveness of the completed design solution • Modify the solution to most effectively solve the design problem 	<ul style="list-style-type: none"> • Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video 	<ul style="list-style-type: none"> • Activity Packets • Worksheets • Calculators • Hand Tools • Production Machines • Measuring Devices • Computer • AutoCAD • West Point Bridge Builder • CAM Software • CNC Equipment 	<ul style="list-style-type: none"> • Teacher Observation • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A 	<ul style="list-style-type: none"> • Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction 	<ul style="list-style-type: none"> • Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

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Curriculum Strand: Final Solution

PA Academic Standards Student must be able to do	Objective Content or process student will be able to know and do	Instructional Methods	Materials/ Resources Textbooks, workbooks, software, hardware, etc	*Assessment Procedures *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	*Additional Learning Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	*Extended Learning Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.7 10 D Utilize computer software to solve specific problems 3.7 12 E Assess the effectiveness of computer communication systems 3.8.12 B Apply the use of ingenuity and technological resources to solve specific societal needs and improve the quality of life. 3.8.10 C Evaluate possibilities consequences and impacts of scientific and technological solutions.	<ul style="list-style-type: none"> • Present the results to the class panel • Defend the completed solution • Assess the final results 	<ul style="list-style-type: none"> • Direct Instruction • Group Work • Demonstrations • Cooperative Learning • Class Discussions • Video 	<ul style="list-style-type: none"> • Computer • CAM Software • CNC Equipment 	<ul style="list-style-type: none"> • Teacher Observation • In-Class Work • Write-ups • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A 	<ul style="list-style-type: none"> • Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction 	<ul style="list-style-type: none"> • Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects