School District of Jefferson

Scope and Sequence

Course - Engineering 3

Grade(s) - 9-12

Unit Theme/Pacing ● 4 -6 Topics or Themes	**Architectural Drafting**	**Mechanical Drafting**	**Transportation (mousetrap Vehicle)**	**Engineering (choice Project)**
Unit Goal Transfer goal-What long term independent accomplishments are desired?	Students will be able to select and use architecture technologies.	Students will analyze and demonstrate the attributes of design	Students will be able to analyze and explain how transportation vehicles and transportation systems work.	Students will be able to apply and demonstrate the attributes of engineering, construction, manufacturing and design
Enduring Understandings Thematic deeper understanding -What specifically do you want students to understand? What inferences should they make?	Students will be able to extend understanding and apply various aspects of architectural drafting knowledge to create and produce appropriate examples of work	Students will be able to extend understanding and apply various aspects of mechanical drafting knowledge to create and produce appropriate examples of work	Students will be able to extend understanding and apply various aspects of transportation and power knowledge to create and produce appropriate examples of work	Students will be able to extend their knowledge of engineering to create a working engineering example of work
Essential Questions What thought provoking questions will foster inquiry, meaning making, and transfer? 2-3 per unit. Debatable, ponder, change your answer, no one correct answer	Why is it important to have an understanding if architectural technologies when making working drawings In which way can I manipulate working drawings in order to have positive impacts on pieces of work	Why is it important to have an understanding if mechanical drafting when making working drawings In which way can I manipulate working drawings in order to have positive impacts on pieces of work	Why is it important to have an understanding of transportation technologies and aspects when making a transportation project In which ways various parts and pieces contribute to the over assembly of a transportation project.	Why is it important to have an understanding of the engineering design process in order to build a working engineering project. In which way can I manipulate various parts of a whole project to create different outcomes.
Standards CCRR standards (List letters and numbers -10R .1.2 National Theme	*AC1.b.11.h - Identify design solutions for residential construction problems* *AC1.a.11.h - The design of structures include a number of requirements.*	*ENG5.b.5.m - Use computers, calculators and technology in various applications.* *ENG4.a.5.h - Identify the design problem to solve and determine how to address it.*	*TR1.b.8.h - define the interdependency of individual systems with a vehicle.* *TR1.b.6.h - explain that all systems demand specific repair procedures in order to achieve highest performance and efficiency.*	*BB.1.a.5.h - Describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.* *BB1.b.6.h - Choose and perform the material process operations of*

				forming, bonding, fastening, and finishing *ENG.1.a.12.h - Requirements of a design, such as criteria2, constraints and efficiency, sometimes compete with each other.*
Learning Targets I can statements. Student friendly descriptions of what you intend students to learn or accomplish in unit lessons	I can properly use the knowledge of architectural drafting to create a working project I can understand the importance of mechanical drafting principles (orthographic, isometric, scaling and drawing) on mechanical drafting parts and examples	I can properly use the knowledge of mechanical drafting to create a working project I can understand the importance of mechanical drafting principles (orthographic, isometric, scaling and drawing) on mechanical drafting parts and examples	I can properly use the knowledge of transportation to create a working project I can understand the importance of architectural stresses (aerodynamics, assembly and design) on transportation examples	I can properly use the engineering design process to create an advanced engineering project I can understand the engineering design process to identify the needs and wants of an advanced engineering design project.
Knowledge and Skills *Knowledge* -What facts/basic concepts should students know and be able to recall? *Skills* - What discrete skills and processes should students be able to use?	Students will know how to apply more advanced architectural drafting techniques to a given project Students will be skilled at measuring, scaling, dimensioning, drawing, interpreting and creating working drawings	Students will know how to apply more advanced mechanical drafting techniques to a given project Students will be skilled at measuring, scaling, dimensioning, drawing, interpreting and creating working drawings	Students will know how to apply transportation techniques to a given project Students will be skilled at designing, manufacturing, assembling, prototyping and assessing.	Students will be able to apply more advanced engineering techniques and technologies to a more advanced project Students will be skilled at creating a project that meets an engineering project need.
Performance Tasks Through what authentic performance task will students demonstrate the desired understandings?	Students will create more advanced working pieces and projects related to Wisconsin state skills standards in a variety of drafting areas.	Students will create more advanced working pieces and projects related to Wisconsin state skills standards in a variety of drafting areas.	Students will create more advanced working pieces and projects related to Wisconsin state skills standards in a variety of transportation areas.	Students will create more advanced working pieces and projects related to Wisconsin state skills standards in a variety of manufacturing and engineering areas.
Resources	Literary and online resources relating to architectural drafting as supplemental instruction including but not	Literary and online resources relating to mechanical drafting as supplemental instruction including but not limited to computer	Literary and online resources relating to transportation as supplemental instruction	Literary and online resources relating to transportation, manufacturing, engineering, mechanical drafting and

	limited to computer program REVIT	program tinkerCAD, and Autodesk Fusion		architectural drafting as supplemental instruction
Evaluative Criteria What criteria will be used to evaluate attainment of desired results?	Combination of formative and summative assessments including but not limited to student demonstrations, tests, quizzes, and other hands or or written assessments	Combination of formative and summative assessments including but not limited to student demonstrations, tests, quizzes, and other hands or or written assessments	Combination of formative and summative assessments including but not limited to student demonstrations, tests, quizzes, and other hands or or written assessments	Combination of formative and summative assessments including but not limited to student demonstrations, tests, quizzes, and other hands or or written assessments
Differentiation for Learning How can this lesson be differentiated for different learning styles or rates of learning?	All assignments, projects, evaluations, etc. will be modified (extra time, group instruction etc.) for individual students as well as following all IEP/504 requirements.	All assignments, projects, evaluations, etc. will be modified (extra time, group instruction etc.) for individual students as well as following all IEP/504 requirements.	All assignments, projects, evaluations, etc. will be modified (extra time, group instruction etc.) for individual students as well as following all IEP/504 requirements.	All assignments, projects, evaluations, etc. will be modified (extra time, group instruction etc.) for individual students as well as following all IEP/504 requirements.