



| ORGANIZING THEME/TOPIC | FOCUS STANDARDS & SKILLS |
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| <p>Nature of Technology</p> <p>How does technology affect our lives? What influences the development of technologies?</p> <p>Time Frame: 1 week and integrated into selected units</p> | <p>Skills in Technology related fields</p> <p>ITEEA.07 Demonstrate an understanding of how technology has changed over time. (</p> <ul style="list-style-type: none"> Identify positive and negative impacts of technology on society and the environment. (ITEEA.05) Identify issues that impact changes in technology. (ITEEA.06) Describe the connection between technology and human want or need. (ITEEA.04) <p>Career and College Readiness</p> <ul style="list-style-type: none"> Technical Reading: Use information provided in manuals, protocols, or by experienced people to see and understand how things work . (ITEEA.07F) Technical writing: Demonstrate clear communication through technical writing skills and presentations. (ITEEA.07F) |
| <p>Safety in the classroom lab</p> <p>Why is safety important in the classroom lab?</p> <p>Safety rules and procedures</p> <ul style="list-style-type: none"> Hand Tools Power Tools Equipment/machines Materials <p>Time Frame: 1 week and integrated throughout course</p> | <p>Skills in Architecture and Engineering</p> <p>ITEEA 12.1 Follow safety rules and procedures for the lab area.</p> <ul style="list-style-type: none"> Safely use hand and power tools and machines (band saw, drill press) to construct a project. Safely use materials to construct a project. <p>Career and College Readiness</p> <ul style="list-style-type: none"> Technical Reading: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (KCCSRS RI.6.1) Technical Reading: Interpret information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. (KCCRS RI.6.7) |

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| <p>Measurement and Mathematics How is measurement and mathematics applied in architecture, construction, and engineering?</p> <ul style="list-style-type: none"> • Standard ruler • Calculations <p>Time Frame: integrated throughout course</p> | <p>Skills in Architecture and Engineering CCSS MP.6 Attend to precision.</p> <ul style="list-style-type: none"> • Use a standard and metric ruler to measure accurately. • Calculate measurements using whole numbers, fractions and decimals. • Accurately measure weight. <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Apply knowledge and skills from other fields of study to the development of technological products or systems. (ITEEA.03.F) |
| <p>Research and Design Process How does the research and design process lead to better solutions?</p> <p>Steps in Research & Development</p> <ul style="list-style-type: none"> • Solution finding and design • Prototype development • Testing • Data collection and analysis • Redesign • Presentation of solution <p>Time Frame: integrated in selected units</p> | <p>Skills in Engineering and Technology ITEEA.09 Apply the steps of the design process.</p> <ul style="list-style-type: none"> • Apply the design and experimental process to solve a problem. • Follow the specific steps in the design process. • Test a design against pre-established criteria and refine as needed. • Analyze experimental data to identify best solution. • Construct 2 and/or 3-dimensional representations of a designed solution. <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Technical writing: Document design process by creating design portfolios, journals, drawings, sketches, or schematics (ITEEA.11) • Utilize computers and calculators in the design process of products and systems. (ITEEA.1.2.J) • Mathematical practices: Make sense of problems and persevere in solving them. (KCCRS.MP.5) |

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| <p>Construction</p> <p>How does construction utilize geometric shapes for strong, safe, and functional design?</p> <p>Application of construction principles</p> <ul style="list-style-type: none"> • Structure Design • Geometric shapes • Strength and functional design • Materials Usage <p>Time Frame: 3 – 4 weeks</p> | <p>Skills in Architecture and Engineering ITEEA.20 Select and use construction technologies and concepts.</p> <ul style="list-style-type: none"> • Identify geometric shapes used for strong, safe and functional design. • Design a product to solve a problem. • Design and build a structure that rests on a foundation. • Follow a plan/procedure for making a product. • Utilize hand and power tools, and materials safely to construct a product. • Calculate material usage. • Utilize virtual simulation to test a solution design. • Analyze a structure to identify best design for strength and function. <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Technical writing: Document design process by creating design process by creating design portfolios, journals, drawings, sketches, or schematics. (ITEEA.11) • Utilize computers and calculators in the design process of products and systems. (ITEEA.1.2.J) |
| <p>Manufacturing</p> <p>Why is the manufacturing process used to build products in industry?</p> <ul style="list-style-type: none"> • Manufacturing process • Durable and non-durable goods <p>Time Frame: 3 – 4 weeks</p> | <p>Skills in Engineering and Technology ITEEA.19 Select and use manufacturing technologies and concepts.</p> <ul style="list-style-type: none"> • Model the manufacturing process (systems of inputs, processes, outputs, feedback). • Apply the manufacturing process to construct a product. • Explain the benefits and drawbacks of manufacturing. • Use tools, materials, and machines safely. • Distinguish goods that are durable and non-durable. <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Technical writing: Demonstrate clear communication through technical writing skills. |
| <p>Visual Communication</p> <p>How do I read mechanical drawings or blueprints? How do I communicate my design ideas in a visual form?</p> <p>Application of Drafting and Design principles</p> <ul style="list-style-type: none"> • Sketching • Manual Drafting • Mechanical drawings • Computer Aided Drafting • Visual Communications <p>Time Frame: 2 weeks and integrated into selected units</p> | <p>Skills in Architecture and Engineering ITEEA.17 Select and use information and communication technologies and concepts.</p> <ul style="list-style-type: none"> • Interpret a mechanical drawing or blueprint. • Develop a pictorial sketch of an object. • Perform the drafting principles needed to draw basic geometric shapes. • Develop a multi-view drawing (manual and/or CAD). • Recognize basic dimensioning according to drafting standards. • Utilize technology to represent design ideas. <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Technical Reading: Use information provided in manuals, protocols, or by experienced people to see and understand how things work. (ITEEA.07.F) • Technical Writing: Demonstrate written or verbal communication utilizing measurements, drawing, or symbols. (ITEEA 17.K) |

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| <p>Power & Energy How can energy resources be used to do work?</p> <ul style="list-style-type: none"> • Laws of motion • Energy • Sustainable and renewable energy <p>Time Frame: 3 weeks</p> | <p>Skills in Engineering and Technology ITEEA.16 Select and use energy and power technologies.</p> <ul style="list-style-type: none"> • Understand how Newton's laws apply to an object. • Demonstrate how energy can be used to do work. • Apply the design process to solve problems related to power & energy. • Design a power system to move an object. • Identify careers related to power & energy, and transportation. • Identify technologies which are sustainable and renewable (green). <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Technical Reading: Use information provided in manuals, protocols, or by experienced people to see and understand how things work. (ITEEA.07.F) • Technical Reading: Follow instructions to operate a system. • Technical writing: Document design process by creating design portfolios, journals, drawings, sketches, or schematics. (ITEEA.11) • Utilize computers and calculators in the design process of products and systems. (ITEEA.1.2.J) |
| <p>Robotics – How mechanisms work How are robots used in our world How do robots work? How is a robot controlled?</p> <p>Robotics in our lives Simple and complex machines Assembly Potential and kinetic energy Mechanisms</p> <ul style="list-style-type: none"> • Motors, • Gears and gear ratios • Drivetrain • Object manipulation <p>Electrical circuitry Remote control Intro to coding for autonomous robots</p> <p>Time Frame: 5-6 weeks</p> | <p>Robotics and Engineering: ITEEA.11.6-8H Apply design process to solve a problem in and beyond the laboratory.</p> <ul style="list-style-type: none"> • Develop and follow a plan of procedure for making or assembling a product. • Build mechanisms to accomplish a task using knowledge of simple machines • Select and design a power system to move an object and do work. • Create circuitry to support <ul style="list-style-type: none"> ○ Motors ○ Remote control ○ Lights and sounds • Predict and test outcome of altering gear ratios. • Create a simple program using graphical code to operate a robot. <p>Career and College Readiness</p> <ul style="list-style-type: none"> • Technical Reading: Interpret information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. (KCCRS RI.6.7) |