



**SPRING GROVE AREA SCHOOL DISTRICT**



**PLANNED COURSE OVERVIEW**

<b>Course Title:</b> Introduction to the Trades <b>Grade Level(s):</b> 9 <b>Units of Credit:</b> .5 <b>Classification:</b> Elective	<b>Length of Course:</b> Half year <b>Periods Per Cycle:</b> 6 <b>Length of Period:</b> 40 Minutes <b>Total Instructional Time:</b> 60 Hours
--	---

***Course Description***

This class explores the essential elements of the skilled trades. Students will develop manual skills, earn special training and/or certifications associated with the skilled trades, and explore a plethora of STEM components. Some examples include, but are not limited to, construction, transportation, manufacturing, computer science, audio/visual, information technology, etc. This course is a building block of the STEM Department and will encourage students to decide whether the trades are a good fit for their talents, aspirations, and career interests. Students will rotate through different areas gaining minimal competencies skills in the following areas: woodworking, metal fabrication, audio/visual, information technology, CAD, robotics, mathematics, and science. Students will participate in projects as they progress through the problem solving, design, practice, and building process. Careers in the skilled trades are in high demand throughout the country. To better prepare students for post-graduate jobs and careers, students will examine numerous components of the trades. As students gain minimum competency skills in various fields, they will gain a better understanding of where their talents and interests lie. This course is a building block of the STEM Department and will encourage students to decide whether the trades are a good fit for their talents, aspirations, and career interests.

***Instructional Strategies, Learning Practices, Activities, and Experiences***

Build Upon and Develop Minimum Competency Skills (MICS) Develop Advanced Competency Skills Design and Self-Reflect for Action Steps	Independent Research Project Construction Posted Objectives and Agendas	Bell Ringers Design, Build, Practice, Assess Process Journal Logs Constructive Responses
---	---	---

***Assessments***

Journals Weekly Checkpoints Small Group Discussions	Independent Projects Group Projects Panels of Experts	Competition Judges Competition Results Interviews with Local Businesses and Organizations
---	---	---

***Materials/Resources***

Technology Procedures and Equipment Instructor Provided Rubrics	Daily, Weekly, and Monthly Student Created Objectives Daily, Weekly, and Monthly Teacher Created Objectives	Competition Guidelines Various Materials Determined by Student(s)' Needs
--	--	---

**Adopted:** 5/22/23

<b>Determine and Define the Problem</b>	
<b>CONTENT/KEY CONCEPTS</b>	<b>OBJECTIVES/STANDARDS</b>
<p><b>Step 1: Determine and define the problem.</b></p> <p><b>Instructional Strategies, Learning Practices, Activities, and Experiences</b>                      What is STEM?                      Review the Design Process and Walkthrough                      Facility Tours                      Review Safety, Tools and Materials, and Protocols                      Display and Explain STEM Promo Video                      STEM Interest and Jobs in STEM Surveys                      Student and Staff Interviews (Teachers, Maintenance, STEM Jobs)                      Trade Specific Mathematics and Measurements                      Technical Drawing/Architectural Scale                      CAD – Fusion 360                      Video Journalism-Adobe Premiere Pro and Suite                      Lasers – Top Competition                      3D Print, Vinyl Cutter, Plastic/Mold Injectors                      Writing Assignments (s)                      Student Led Choice Project</p> <p><b>Assessments</b>                      Journals and Weekly Checkpoints                      Small Group Discussions and Group Projects                      Independent Projects                      Interviews with Local Businesses and Organizations</p> <p><b>Materials/Resources</b>                      Technology Procedures and Equipment                      Instructor Provided Rubrics                      Daily, Weekly, and Monthly Student Created Objectives                      Daily, Weekly, and Monthly Teacher Created Objectives Competition Guidelines                      Various Materials Determined by Student(s)' Needs</p>	<p>HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</p> <p>HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.</p> <p>HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>

Students Collect Information	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p><b>Step 2: During individual STEM units of study (1-3 cycles), students will complete objectives to acquire minimum competency skills and knowledge. Students will explore the materials and resources and materials they will utilize through the design and build process.</b></p> <p><b>Instructional Strategies, Learning Practices, Activities, and Experiences</b>                      What is STEM?                      Review the Design Process and Walkthrough                      Facility Tours                      Review Safety, Tools and Materials, and Protocols                      Display and Explain STEM Promo Video                      STEM Interest and Jobs in STEM Surveys                      Student and Staff Interviews (Teachers, Maintenance, STEM Jobs)                      Trade Specific Mathematics and Measurements                      Technical Drawing/Architectural Scale                      CAD – Fusion 360                      Video Journalism-Adobe Premiere Pro and Suite                      Lasers – Top Competition                      3D Print, Vinyl Cutter, Plastic/Mold Injectors                      Writing Assignments (s)                      Student Led Choice Project</p> <p><b>Assessments</b>                      Journals and Weekly Checkpoints                      Small Group Discussions and Group Projects                      Independent Projects                      Interviews with Local Businesses and Organizations</p> <p><b>Materials/Resources</b>                      Technology Procedures and Equipment                      Instructor Provided Rubrics                      Daily, Weekly, and Monthly Student Created Objectives                      Daily, Weekly, and Monthly Teacher Created Objectives Competition                      Guidelines                      Various Materials Determined by Student(s) Needs</p>	<p>HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</p> <p>HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.</p> <p>HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>

<b>Students Brainstorm and Analyze Ideas</b>	
<b>CONTENT/KEY CONCEPTS</b>	<b>OBJECTIVES/STANDARDS</b>
<p><b>Step 3: Students will use the MICS for each unit of study to develop action steps, propose possible successes and failures, and propose their expectations.</b></p> <p><b>Instructional Strategies, Learning Practices, Activities, and Experiences</b>                      What is STEM?                      Review the Design Process and Walkthrough                      Facility Tours                      Review Safety, Tools and Materials, and Protocols                      Display and Explain STEM Promo Video                      STEM Interest and Jobs in STEM Surveys                      Student and Staff Interviews (Teachers, Maintenance, STEM Jobs)                      Trade Specific Mathematics and Measurements                      Technical Drawing/Architectural Scale                      CAD – Fusion 360                      Video Journalism-Adobe Premiere Pro and Suite                      Lasers – Top Competition                      3D Print, Vinyl Cutter, Plastic/Mold Injectors                      Writing Assignments (s)                      Student Led Choice Project</p> <p><b>Assessments</b>                      Journals and Weekly Checkpoints                      Small Group Discussions and Group Projects                      Independent Projects                      Interviews with Local Businesses and Organizations</p> <p><b>Materials/Resources</b>                      Technology Procedures and Equipment                      Instructor Provided Rubrics                      Daily, Weekly, and Monthly Student Created Objectives                      Daily, Weekly, and Monthly Teacher Created Objectives Competition Guidelines                      Various Materials Determined by Student(s)' Needs</p>	<p>HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</p> <p>HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.</p> <p>HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>

Students Develop Solutions/Build Model(s)	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p><b>Step 4: For each unit of STEM, students will implement their design and solution to gauge their failures, weaknesses, and strengths to create well-informed decisions.</b></p> <p><b>Instructional Strategies, Learning Practices, Activities, and Experiences</b>                      What is STEM?                      Review the Design Process and Walkthrough                      Facility Tours                      Review Safety, Tools and Materials, and Protocols                      Display and Explain STEM Promo Video                      STEM Interest and Jobs in STEM Surveys                      Student and Staff Interviews (Teachers, Maintenance, STEM Jobs)                      Trade Specific Mathematics and Measurements                      Technical Drawing/Architectural Scale                      CAD – Fusion 360                      Video Journalism-Adobe Premiere Pro and Suite                      Lasers – Top Competition                      3D Print, Vinyl Cutter, Plastic/Mold Injectors                      Writing Assignments (s)                      Student Led Choice Project</p> <p><b>Assessments</b>                      Journals and Weekly Checkpoints                      Small Group Discussions and Group Projects                      Independent Projects                      Interviews with Local Businesses and Organizations</p> <p><b>Materials/Resources</b>                      Technology Procedures and Equipment                      Instructor Provided Rubrics                      Daily, Weekly, and Monthly Student Created Objectives                      Daily, Weekly, and Monthly Teacher Created Objectives Competition Guidelines                      Various Materials Determined by Student(s)' Needs</p>	<p>HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</p> <p>HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p> <p>HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.</p> <p>HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>

Students Present Ideas to Others for Feedback	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p><b>Step 5: Reflection. Students will present their completed projects to others (examples: teachers, students, experts in the field, businesses, organizations, or another group as determined by the teacher and students). Students will explain their designs, actions steps, and future applications for modification(s).</b></p> <p><b>Instructional Strategies, Learning Practices, Activities, and Experiences</b>                      What is STEM?                      Review the Design Process and Walkthrough                      Facility Tours                      Review Safety, Tools and Materials, and Protocols                      Display and Explain STEM Promo Video                      STEM Interest and Jobs in STEM Surveys                      Student and Staff Interviews (Teachers, Maintenance, STEM Jobs)                      Trade Specific Mathematics and Measurements                      Technical Drawing/Architectural Scale                      CAD – Fusion 360                      Video Journalism-Adobe Premiere Pro and Suite                      Lasers – Top Competition                      3D Print, Vinyl Cutter, Plastic/Mold Injectors                      Writing Assignments (s)                      Student Led Choice Project</p> <p><b>Assessments</b>                      Journals and Weekly Checkpoints                      Small Group Discussions and Group Projects                      Independent Projects                      Interviews with Local Businesses and Organizations</p> <p><b>Materials/Resources</b>                      Technology Procedures and Equipment                      Instructor Provided Rubrics                      Daily, Weekly, and Monthly Student Created Objectives                      Daily, Weekly, and Monthly Teacher Created Objectives Competition Guidelines                      Various Materials Determined by Student(s') Needs</p>	<p>HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.                      HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.                      HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.                      HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>

<b>Students Synergize All Steps and Make Recommendations</b>	
<b>CONTENT/KEY CONCEPTS</b>	<b>OBJECTIVES/STANDARDS</b>
<p><b>Step 6: Students will make improvements and recommendations regarding their design, builds, or projects. The goal is to continue to develop an appreciation for STEM skills and knowledge as they continue to grow through each unit of study.</b></p> <p><b>Instructional Strategies, Learning Practices, Activities, and Experiences</b>                      What is STEM?                      Review the Design Process and Walkthrough                      Facility Tours                      Review Safety, Tools and Materials, and Protocols                      Display and Explain STEM Promo Video                      STEM Interest and Jobs in STEM Surveys                      Student and Staff Interviews (Teachers, Maintenance, STEM Jobs)                      Trade Specific Mathematics and Measurements                      Technical Drawing/Architectural Scale                      CAD – Fusion 360                      Video Journalism-Adobe Premiere Pro and Suite                      Lasers – Top Competition                      3D Print, Vinyl Cutter, Plastic/Mold Injectors                      Writing Assignments (s)                      Student Led Choice Project</p> <p><b>Assessments</b>                      Journals and Weekly Checkpoints                      Small Group Discussions and Group Projects                      Independent Projects                      Interviews with Local Businesses and Organizations</p> <p><b>Materials/Resources</b>                      Technology Procedures and Equipment                      Instructor Provided Rubrics                      Daily, Weekly, and Monthly Student Created Objectives                      Daily, Weekly, and Monthly Teacher Created Objectives                      Competition Guidelines                      Various Materials Determined by Student(s)' Needs</p>	<p>HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.                      HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.                      HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.                      HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>