Sparta Area School District

Good people, great schools.

Course Outcome Summary

Course Information: Ag/Tech Ed

Description: Build character with engaging people matter team building activities. Build your hand and power tool skills with tool use exercises. Then build one of Sparta's favorite woodworking projects when you construct and custom paint your very own bubble gum/candy machine. If time permits, students can be introduced to a variety of technologies by rotating through several of the Technology Centers. Some of the centers include pewter figurine casting, forming acrylic iPad/iPod stands, expanded bead mini- footballs, use a pantograph and router to create a wooden sign, draw a basic pickup truck with CAD (Computer Aided Drafting).

Instruction Level: **Grade Level 7**

Total Credits: **.5**

Prerequisites: None

Textbooks: None

Course Standards:

Common Career and Technical Core

1. Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
2. Identify and apply employability skills.
3. Assess benefits and challenges of working in diverse settings and on diverse teams.
4. Apply leadership skills in real-world, family, community and business and industry applications.

ACT Math Standards

1. Perform one-operation computation with whole numbers and decimals
2. Recognize equivalent fractions and fractions in lowest terms
3. Recognize one-digit factors of a number
4. Order fractions
5. Find and use the least common multiple

Next Generation Science Standards

1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Technology Education Standards

1. Demonstrate use of the Standard Measuring System to the 1/16" and the Metric Measuring System to millimeters.
2. Add, subtract, multiply and divide in the Standard Measuring System to the 1/16" and the Metric Measuring System to millimeters.
3. Demonstrate proficiency in the use of simple hand tools such as hammers, screwdrivers, handsaws, planes, sandpaper, nail sets, tin shears, framing squares, utility knives, chalk lines, etc.
4. Demonstrate the safe and proper use of power tools.
5. Demonstrate proficiency in the proper care of all tools used in a class or lab.
6. Students will describe how resources are the things needed to complete a task {e.g., tools, machines, materials, information, energy, people, capital and time}.
7. Use appropriate tools to measure and layout a piece of material {e.g., length, width, thickness, angles, circles, arcs and volume} within tolerances.

Units

Unit 1 - Character and Leadership – "People Matter" and Personal Development

Unit 2 - Basic Hand Tool Exercises Skill Development

Unit 3 – Construction and Manufacturing Processes - Gum/Candy Machine

Unit 4 – Technology Lab Stations – Material Science-Polymers & Metals, AutoCAD, Router with Pantograph

Unit Outlines

1. Character and Leadership – "People Matter"

Standards:

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Identify and apply employability skills.
- Assess benefits and challenges of working in diverse settings and on diverse teams.
- Apply leadership skills in real-world, family, community and business and industry applications.

Essential Question:

Students will be able to answer the question(s):

- What are some ways I/we can practice the Spartan Way?
- How can I become a better person, classmate or team member?
- Why are "People Matter" skills so important?

Essential Knowledge:

- Ongoing key concepts/vocabulary/ideas that students strive to implement throughout life.
- Ongoing character education, diligence, responsibility, honesty, work ethics, reinforcement of the Sparta School District Initiative- "The Spartan Way- Respectful, Responsible, Safe"

2. Unit 2. Basic Hand Tool Exercises Skill Development

Standards:

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Identify and apply employability skills.
- Assess benefits and challenges of working in diverse settings and on diverse teams.
- Apply leadership skills in real-world, family, community and business and industry applications.
- Perform one-operation computation with whole numbers and decimals
- Recognize equivalent fractions and fractions in lowest terms.
- Recognize one-digit factors of a number
- Order fractions
- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- Demonstrate proficiency in the use of simple hand tools such as hammers, screwdrivers, handsaws, planes, sandpaper, nail sets, tin shears, framing squares, utility knives, chalk lines, etc.
- Demonstrate the safe and proper use of power tools.
- Demonstrate proficiency in the proper care of all tools used in a class or lab.
- Students will describe how resources are the things needed to complete a task {e.g., tools, machines, materials, information, energy, people, capital and time}.
- Use appropriate tools to measure and layout a piece of material {e.g., length, width, thickness, angles, circles, arcs and volume} within tolerances.

Essential Question:

Students will be able to answer the question(s):

- What are some hand tools that the average person will use throughout life?
- What are some of the technical skills needed to operate a variety of hand tools?
- How are these hand tools used safely and properly?

Essential Knowledge:

- Basic hand held, manual and power tool familiarity, safe and proper use, skill development exercises are conducted with the utilization of technical writing and reading applications instruction.
- Knowledge will be gained on how to evaluate safe and effective manual and power hand tool use.
- How measuring instruments and knowledgeable use skills are valuable.

3. Construction and Manufacturing Processes - Gum/Candy Machine

Standards

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Identify and apply employability skills.
- Assess benefits and challenges of working in diverse settings and on diverse teams.
- Apply leadership skills in real-world, family, community and business and industry applications.
- Perform one-operation computation with whole numbers and decimals.
- Recognize equivalent fractions and fractions in lowest terms
- Find and use the least common multiple.
- Demonstrate use of the Standard Measuring System to the 1/16" and the Metric Measuring System to millimeters.
- Add, subtract, multiply and divide in the Standard Measuring System to the 1/16.
- Demonstrate proficiency in the use of simple hand tools such as hammers, screwdrivers, handsaws, planes, sandpaper, nail sets, tin shears, framing squares, utility knives, chalk lines, etc.
- Demonstrate the safe and proper use of power tools.
- Demonstrate proficiency in the proper care of all tools used in a class or lab.
- Students will describe how resources are the things needed to complete a task {e.g., tools, machines, materials, information, energy, people, capital and time}.
- Use appropriate tools to measure and layout a piece of material {e.g., length, width, thickness, angles, circles, arcs and volume} within tolerances.
- Design is a creative planning process that leads to useful products and systems.
- Requirements for a design are made up of criteria and constraints.
- Modeling, testing, evaluating and modifying are used to transform ideas into practical solutions.
- Make a product or system.

Essential Question:

- How does the manufacturing, construction, and assembly processes work together to make this machine operational?

Essential Knowledge:

- Key concepts/vocabulary/ideas that students will understand are measurement, material types, dimensions and sizing, assembling, fastening, adhering, finishing, minimum operation and finish qualifications.

4. Technology Lab Stations – Material Science- Polymers & Metals, AutoCAD, Router with Pantograph

Standards

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Identify and apply employability skills.
- Perform one-operation computation with whole numbers and decimals
- Recognize equivalent fractions and fractions in lowest terms
- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- Demonstrate proficiency in the proper care of all tools used in a class or lab.
- Students will describe how resources are the things needed to complete a task {e.g., tools, machines, materials, information, energy, people, capital and time}.
- Use appropriate tools to measure and layout a piece of material {e.g., length, width, thickness, angles, circles, arcs and volume} within tolerances.
- Design is a creative planning process that leads to useful products and systems.
- Requirements for a design are made up of criteria and constraints.
- Modeling, testing, evaluating and modifying are used to transform ideas into practical solutions.
- Make a product or system and document the process.

Essential Question:

Students will be able to answer the question(s):

- What are some basic materials and their characteristics that help determine its selection for product design and use?

Essential Knowledge:

- Key concepts/vocabulary/ideas that students will understand are measurement, material types, dimensions and sizing, assembling, fastening, adhering, finishing, minimum operation and finish qualifications.