DELAWARE VALLEY SCHOOL DISTRICT

PLANNED INSTRUCTION

A PLANNED COURSE FOR:

Introduction to Technology

Grade Level: 9-12

Date of Board Approval: _____

DELAWARE VALLEY SCHOOL DISTRICT

Planned Instruction

Title of Planned Instruction: Introduction to Technology

Subject Area: Technology Education Grade(s):9-12

Course Description: This course is intended for all students who are interested in developing a basic understanding of and appreciation for our technological world. Students will explore and complete assignments and projects that focus on the areas of design & engineering, materials, and communication technology. Specific topics include, but are not limited to, lineal measurement, sketching and mechanical drafting, working drawings / plans & procedures, structural engineering, design, construction and testing, graphic design principles and woodworking. Additionally, students will demonstrate safe appropriate use of hand & power tools in the completion of all assignments.

Time/Credit for the Course: 70 Hours / ½ Credit

Curriculum Writing Committee: Eric Thiele

Course Weighting

Participation	**10%**
Measurement Assignments	**10%**
Drafting Assignments	**20%**
Projects	**60%**
Total	**100%**

Curriculum Map

Overview: This course will provide in introduction to concepts used in technology including lineal measurement, drafting tools and techniques, single and multi-view drawings, planning and documentation of a project, designing structures to withstand different stresses, creating scale models of structures, testing and evaluating structural designs, safely using machines and equipment, assembling multi-part mechanisms and proper application of various finishes.

Goals:

1. **Marking Period One -Overview based on 45 days:**
    - Students will learn lineal measurement with precision to 1/16”
    - Students will demonstrate mechanical drawing using drafting tools
    - Students will differentiate between single view and multi view projection
    - Students will learn the importance of planning and documentation in the successful completion of projects
    - Students will apply concepts such as planning within a budget
    - Students will learn the various forces that act on all structures
    - Students will demonstrate safe tool and equipment usage
    - Students will evaluate structural designs by performing tests

2. **Marking Period Two -Overview based on 45 days:**
    - Students will demonstrate lineal measurement with precision to 1/16”
    - Students will create multi-view drawings and bill of materials
    - Students will utilize layout and measurement tools
    - Students will demonstrate use and operation of hand and power woodworking tools
    - Students will perform safe usage and operation of a LASER engraver
    - Students will apply graphic design principals as it relates to proportion
    - Students will learn the importance of care and accuracy in processing material for quality
    - Students will understand order in processing and assembly procedures
    - Students will learn the benefits and drawbacks of assuming responsibility

UNIT:1

Big Ideas:

- Technology is created, used, and modified by humans.
- Knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies.
- Decisions about the use of products and systems can result in known and unexpected consequences.

- Creating optimal solutions under constraints are a primary component of technological problem solving (e.g., tools/machines, materials, information, people, capital, energy, and time).
- Technological design is a creative process that anyone can do which may result in new inventions and innovations, both expectedly and unexpectedly.
- Technological design and problem solving requires the ability to clearly communicate engineered solutions.
- Technological design and problem solving utilizes a series of steps that take place in a well-defined sequence.
- Technological design and problem solving requires the application of hands-on abilities such as sketching, prototyping, and fabricating.

UNIT:2

Big Ideas:

- Technology is created, used, and modified by humans.
- Knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies.
- Decisions about the use of products and systems can result in known and unexpected consequences.
- Creating optimal solutions under constraints are a primary component of technological problem solving (e.g., tools/machines, materials, information, people, capital, energy, and time).
- Technological design is a creative process that anyone can do which may result in new inventions and innovations.

Primary Textbook(s) Used for this Course of Instruction

Name of Textbook: **Technology Engineering & Design**

Textbook ISBN #: **978-0-07-876810-1**

Textbook Publisher &Year of Publication: **Glencoe/McGraw-Hill 2008**

Curriculum Textbook is utilized in **Introduction to Technology**:

Curriculum Plan

Unit: 1 **Time Range in Days:45**

Standard(s):
(Number Only- See Appendix for Description) 3.5.9-12.I, 3.5.9-12.K, 3.5.9-12.O, 3.5.9-12.P, 3.5.9-12.Q, 3.5.9-12.U3.5.9-12.Y

Objectives:

- Students will develop proficiency in measuring to 1/16" precision. (DOK3)
- Students will develop proficiency in drawing lines to 1/16" precision.(DOK3)
- Students will recognize the need for planning and use the engineering/design model. (DOK1)
- Students will work within the constraints of style, size, and quantity of material. (DOK3)
- Students will design, construct, and test their structure with emphasis placed on efficiency. (DOK4)
- Students will document their work and respond to a writing prompt that will encourage them to analyze their results. (DOK4)

Core Activities and Corresponding Instructional Methods:

1. Develop lineal measurement proficiency to the nearest 16th inch through the use of various handouts and worksheets as well as other physical objects in the lab.
2. Use basic mechanical drawing equipment to develop and improve accuracy in constructing various line types. Repetitive activity for skill development.
3. Independent and group work to research bridge types and applications.
    a. Truss bridge designs
    b. Influence on economic development
    c. Local examples of various types
4. Given size constraints, material budget, and information regarding the stress analyzer used for testing, students will use the engineering/problem solving model to design a scaled truss bridge.
5. Using the multi-view drawing as a template, students will construct their bridge prototype.
6. After completion, bridges will be weighed prior to testing to calculate the efficiency of the structure. This is simply the ratio of the live load divided by the dead load.
7. Determine the relationship between and factors influencing the structural failure of their design.
8. Using a writing prompt, analyze their work and make predictions to improve future results.
9. Time permitting, redesign, rebuild, and retest the structure, in an attempt to improve results.

Assessments:

Diagnostic:

- Oral response/discussion

Formative:

- Reading assignments, vocabulary/concept activities
- Drawing assignments

Summative:

- Prototype design and evaluate/test/document results

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Unit: 2 **Time Range in Days:45**

Standard(s):
3.5.9-12.AA, 3.5.9-12.OO, 3.5.9-12.QQ,

Objectives:

- Students will read and interpret a set of working drawings, then execute those plans to create a product. (DOK2)
- Students will improve proficiency in measuring to 1/16" precision. (DOK1)
- Students will continue to recognize the need for planning and use the engineering/design model. (DOK1)
- Students will work within the constraints of a set of working drawings to build to a set tolerance. (DOK3)
- Students will demonstrate safe and proper use of the necessary layout, measurement, and processing tools and equipment to build a product. (DOK2)
- Students will develop confidence in their ability to and appreciation for work. (DOK3)
- Students will document their work and respond to a writing prompt that will encourage them to reflect on their effort. (DOK4)
- Students will demonstrate graphic design principals and develop an individual design. (DOK3)

Core Activities and Corresponding Instructional Methods:

1. Continue to develop lineal measurement proficiency to the nearest 16th inch through the use of various handouts and worksheets as well as other physical objects in the lab.
2. Independent and group work to view and interpret working drawings.
3. Following lectures, demonstrations, and safety testing, students will safely & effectively:
    a. Use layout and measuring tools
    b. Use basic hand and power tools
    c. Use stationary woodworking machines and equipment
    d. Use a LASER engraver
4. Develop an understanding of basic woodworking terminology related to board layout and grain direction.
5. Use appropriate tools and techniques to assemble various parts.
6. Demonstrate sanding and finishing methods as discussed.
7. Develop an understanding of basic graphic design principals.
8. Demonstrate proper procedure for adjusting the LASER engraver to accommodate different sizes/types of materials.

Assessments:

Diagnostic:

- Oral response/discussion

Formative:

- Reading assignments, vocabulary/concept activities
- Drawing review and interpretation

Summative:

- Product construction and assembly