

## Curriculum Map: Wood Technology 2 2020/21

Course: BLDG CONST Sub-topic: Uncategorized

Grade(s): 9 to 12

**Course Description:** In this second course of study, the student is taught safe methods of operation of all stationary woodworking machines. An understanding of the design and function, as well as the limitations of each specific machine is covered. Students design and construct more advanced projects with an emphasis on using the design process to solve problems. Wood Tech II can be repeated for a second semester for additional credit based upon more advanced class work. Students will be assigned skill-development projects for the first 6-9 weeks for which there is no charge for materials. During the remaining time, it is understood that the student will pay a nominal charge for the materials used to construct projects of his/her choice. Students also have the option of purchasing better quality materials for required projects.

### Unit: 1. Intro to Wood Working

Timeline: Week 1 to 2

**Unit Description:** Unit 1 is an overall review of the shop area and procedures. We cover general safety procedures, fire safety, and specific safety procedures for every tool and process before we engage in any activity. In the unit, the technological process, which is used for every project, is also reviewed.

- Unit Essential Questions:**
1. How have technological developments impacted devices, processes, and systems for the way we live?
  2. How do various areas of technology influence the economy, the environment, and society?
  3. How would you apply technological design and problem solving methods in the development of inventions and innovations?
  4. What knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies?
  5. What is technological literacy?

- Unit Big Ideas:**
1. A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.
  2. Each area of technology has a set of characteristics that separates it from others; however, many areas overlap in order to meet human needs and wants.
  3. Technological design is a creative process that anyone can do which may result in new inventions and innovations.
  4. Technology is created, used and modified by humans.
  5. Technological literacy is the ability to use, assess and manage technology around us.

**Unit Materials:** Safety glasses, safety forms, safety quizzes, ruler quizzes, stationary power tools, portable power tools, hand tools, a good selection of lumber, screws, glue, nails, clamps, rulers, measurement worksheets.

**Unit Assignments:** General safety quiz, power tool safety quiz for each new power tool, ruler quiz, technological process worksheet.

**Unit Key Terminology & Definitions**

Technology: the application of scientific knowledge for practical purposes, especially in industry

System: a set of principles or procedures according to which something is done; an organized scheme or method.

Manufacturing: the making of articles on a large scale using machinery; industrial production.

Invention: The act of creating something. Typically a process or device.

Innovation: A new method, product, idea, etc.

Diagnose: To figure out what is wrong by examination of symptoms.

Troubleshoot: To trace and correct faults in a system.

Technical Drawings: A precise and detailed drawing of an object, as employed in architecture or engineering.

Isometric Drawings: A pictorial representation of an object in which all three dimensions are drawn at full scale rather than foreshortening them to the true projection.

Technological Method: 1.) identify a problem, 2.) research the problem, 3.) generate possible solutions, 4.) select the best solution, 5.) create a model, 6.) test the model, 7.) refine and retest the model as needed, and 6.) communicate the final solution.

Project Proposal: A Project Proposal is a written offer from a bidder to the owner, preferably on a prescribed proposal form, to perform the work and to furnish all labor, materials, equipment and/or services for the prices and terms quoted by the bidder.

Scope of Work: (SOW) The area in an agreement where the work to be performed is described.

Project Management: The way in which a person organizes and manages resources that are necessary to complete a project

Technological Literacy: the ability to understand, use, assess, design, and produce technology

21st century skills: Skills, abilities, and learning dispositions that have been identified as being required for success in society and workplaces by educators, business leaders, academics, and governmental agencies.

**STANDARDS: STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.E6 (Advanced)</a>	Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.

(\* standards consolidated from Topic level)

**Topic: 1.1 Shop and Workplace Safety Review**

Minutes for Topic: 88

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.

**Topic: 1.2 Tool Operation Review**

Minutes for Topic: 88

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.

[3.4.10.D2 \(Advanced\)](#)

Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.

**Topic: 1.3 Measurement for Woodworking Review**

Minutes for Topic: 88

**Topic: 1.4 Review of the Technological Process**

Minutes for Topic: 176

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

[3.4.10.C1 \(Advanced\)](#)

Apply the components of the technological design process.

[3.4.10.C2 \(Advanced\)](#)

Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.

[3.4.10.C3 \(Advanced\)](#)

Illustrate the concept that not all problems are technological and not every problem can be solved using technology.

[3.4.10.E6 \(Advanced\)](#)

Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.

**Unit: 2. Project 1**

Timeline: Week 3 to 4

**Unit**

**Description:** In unit 2, students complete their first project (usually a small wooden tote or something similar). Students review the planning process, the technological process, all shop procedures involved, and the key elements of project management. Student are re-trained on all required machinery before being given permission to use it. The first project is designed to review all the skills and techniques learned in Wood Technology 1.

**Unit**

**Essential**

**Questions:**

1.

How have technological developments impacted devices, processes, and systems for the way we live?

2.

How do various areas of technology influence the economy, the environment, and society?

3.

How would you apply technological design and problem solving methods in the development of inventions and innovations?

4.

What knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies?

5.

What is technological literacy?

**Unit Big**

**Ideas:**

1.

A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.

2.

Each area of technology has a set of characteristics that separates it from others; however, many areas overlap in order to meet human needs and wants.

3.

Technological design is a creative process that anyone can do which may result in new inventions and innovations.

4.

Technology is created, used and modified by humans.

5.

Technological literacy is the ability to use, assess and manage technology around us.

**Unit**

**Materials:**

Safety glasses, safety quizzes, ruler quizzes, stationary power tools, portable power tools, hand tools, a good selection of lumber, screws, glue, nails, clamps, rulers, measurement worksheets, clear wood finish with brushes.

**Unit**

**Assignments:** Technical drawing, isometric drawing, material list, cost proposal, completed project.

**Unit Key****Terminology & Definitions**

Technology: the application of scientific knowledge for practical purposes, especially in industry

System: a set of principles or procedures according to which something is done; an organized scheme or method.

Manufacturing: the making of articles on a large scale using machinery; industrial production.

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Technological Literacy: the ability to understand, use, assess, design, and produce technology

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<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.A3 (Advanced)</a>	Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B2 (Advanced)</a>	Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.D1 (Advanced)</a>	Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.D3 (Advanced)</a>	Synthesize data, analyze trends, and draw conclusions regarding the effect of technology on the individual, society, and the environment.
<a href="#">3.4.10.E6 (Advanced)</a>	Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

(\* standards consolidated from Topic level)

**Topic: 2.1 Project Planning**

Minutes for Topic: 88

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.A3 (Advanced)</a>	Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
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<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.D1 (Advanced)</a>	Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

**Topic: 2.2 Tool Operation**

Minutes for Topic: 44

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B2 (Advanced)</a>	Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

**Topic: 2.3 Construction Techniques**

Minutes for Topic: 220

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A1 (Advanced)</a>	Illustrate how the development of technologies is often driven by profit and an economic market.
<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

**Topic: 2.4 Project Finish**

Minutes for Topic: 88

**STANDARDS**

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<a href="#">3.4.10.E6 (Advanced)</a>	Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

### Unit: 3. Project 2

Timeline: Week 5 to 6

**Unit Description:** In unit 3, students will work through the entire technological process once again to complete a second project. The second project (typically a small trinket box) requires a similar skill set as the first project but students will be introduced to some new joinery methods and techniques.

#### Unit Essential Questions:

1. How have technological developments impacted devices, processes, and systems for the way we live?
2. How do various areas of technology influence the economy, the environment, and society?
3. How would you apply technological design and problem solving methods in the development of inventions and innovations?
4. What knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies?
5. What is technological literacy?

#### Unit Big Ideas:

1. A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.
2. Each area of technology has a set of characteristics that separates it from others; however, many areas overlap in order to meet human needs and wants.
3. Technological design is a creative process that anyone can do which may result in new inventions and innovations.
4. Technology is created, used and modified by humans.
5. Technological literacy is the ability to use, assess and manage technology around us.

#### Unit Materials:

Safety glasses, safety quizzes, ruler quizzes, stationary power tools, portable power tools, hand tools, a good selection of lumber, screws, glue, nails, clamps, rulers, measurement worksheets, clear wood finish with brushes.

#### Unit Assignments:

Technical drawing, isometric drawing, material list, cost proposal, completed project.

#### Unit Key Terminology & Definitions :

Technology: the application of scientific knowledge for practical purposes, especially in industry

System: a set of principles or procedures according to which something is done; an organized scheme or method.

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<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.A3 (Advanced)</a>	Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B2 (Advanced)</a>	Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.D1 (Advanced)</a>	Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.D3 (Advanced)</a>	Synthesize data, analyze trends, and draw conclusions regarding the effect of technology on the individual, society, and the environment.
<a href="#">3.4.10.E6 (Advanced)</a>	Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

(\* standards consolidated from Topic level)

### **Topic: 3.1 Project Planning**

Minutes for Topic: 88

#### **STANDARDS**

STATE: [Pennsylvania SAS Academic Standards \(2009-2013\)](#)

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<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
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<a href="#">3.4.10.D1 (Advanced)</a>	Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

### **Topic: 3.2 Tool Operation**

Minutes for Topic: 44

## STANDARDS

STATE: Pennsylvania SAS Academic Standards (2009-2013)

- [3.4.10.A2 \(Advanced\)](#) Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
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- [3.4.10.D2 \(Advanced\)](#) Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- [3.4.10.E7 \(Advanced\)](#) Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

### Topic: 3.3 Construction Techniques

Minutes for Topic: 220

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- [3.4.10.E7 \(Advanced\)](#) Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

### Topic: 3.4 Project Finish

Minutes for Topic: 88

## STANDARDS

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- [3.4.10.E7 \(Advanced\)](#) Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

## Unit: 4. Project 3

Timeline: Week 7 to 9

**Unit Description:** Unit 4 serves as an opportunity to review and build upon previously taught cabinet making techniques. Students build a small desk organizer with drawers and compartments. There is added focus on accuracy with this project.

### Unit

#### Essential

#### Questions:

1. How have technological developments impacted devices, processes, and systems for the way we live?
2. How do various areas of technology influence the economy, the environment, and society?
3. How would you apply technological design and problem solving methods in the development of inventions and innovations?
4. What knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies?
- 5.



What is technological literacy?

**Unit Big Ideas:**

1.  
A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.
2.  
Each area of technology has a set of characteristics that separates it from others; however, many areas overlap in order to meet human needs and wants.
3.  
Technological design is a creative process that anyone can do which may result in new inventions and innovations.
4.  
Technology is created, used and modified by humans.
5.  
Technological literacy is the ability to use, assess and manage technology around us.

**Unit Materials:**

Safety glasses, safety quizzes, ruler quizzes, stationary power tools, portable power tools, hand tools, a good selection of lumber, screws, glue, nails, clamps, rulers, measurement worksheets, clear wood finish with brushes.

**Unit Assignments:**

Technical drawing, isometric drawing, material list, cost proposal, completed project.

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Troubleshoot: To trace and correct faults in a system.

Technical Drawings: A precise and detailed drawing of an object, as employed in architecture or engineering.

Isometric Drawings: A pictorial representation of an object in which all three dimensions are drawn at full scale rather than foreshortening them to the true projection.

Technological Method: 1.) identify a problem, 2.) research the problem, 3.) generate possible solutions, 4.) select the best solution, 5.) create a model, 6.) test the model, 7.) refine and retest the model as needed, and 6.) communicate the final solution.

Project Proposal: A Project Proposal is a written offer from a bidder to the owner, preferably on a prescribed proposal form, to perform the work and to furnish all labor, materials, equipment and/or services for the prices and terms quoted by the bidder.

Scope of Work: (SOW) The area in an agreement where the work to be performed is described.

Project Management: The way in which a person organizes and manages resources that are necessary to complete a project

Technological Literacy: the ability to understand, use, assess, design, and produce technology

21st century skills: Skills, abilities, and learning dispositions that have been identified as being required for success in society and workplaces by educators, business leaders, academics, and governmental agencies.

**STANDARDS: STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

[3.4.10.A1 \(Advanced\)](#) Illustrate how the development of technologies is often driven by profit and an economic market.

[3.4.10.A2 \(Advanced\)](#) Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.

[3.4.10.A3 \(Advanced\)](#) Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.

[3.4.10.B1 \(Advanced\)](#) Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.

<a href="#">3.4.10.B2 (Advanced)</a>	Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.D3 (Advanced)</a>	Synthesize data, analyze trends, and draw conclusions regarding the effect of technology on the individual, society, and the environment.
<a href="#">3.4.10.E6 (Advanced)</a>	Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

(\* standards consolidated from Topic level)

#### Topic: 4.1 Project Planning

Minutes for Topic: 88

##### STANDARDS

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.A3 (Advanced)</a>	Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.
<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

#### Topic: 4.2 Tool Operation

Minutes for Topic: 44

##### STANDARDS

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.B1 (Advanced)</a>	Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.
<a href="#">3.4.10.B2 (Advanced)</a>	Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

#### Topic: 4.3 Construction Techniques

Minutes for Topic: 220

##### STANDARDS

STATE: Pennsylvania SAS Academic Standards (2009-2013)

<a href="#">3.4.10.A1 (Advanced)</a>	Illustrate how the development of technologies is often driven by profit and an economic market.
<a href="#">3.4.10.A2 (Advanced)</a>	Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
<a href="#">3.4.10.B3 (Advanced)</a>	Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
<a href="#">3.4.10.B4 (Advanced)</a>	Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
<a href="#">3.4.10.C1 (Advanced)</a>	Apply the components of the technological design process.

- [3.4.10.C2 \(Advanced\)](#) Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
- [3.4.10.C3 \(Advanced\)](#) Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
- [3.4.10.E7 \(Advanced\)](#) Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

**Topic: 4.4 Project Finish**

Minutes for Topic: 88

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

- [3.4.10.A2 \(Advanced\)](#) Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- [3.4.10.B4 \(Advanced\)](#) Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
- [3.4.10.D3 \(Advanced\)](#) Synthesize data, analyze trends, and draw conclusions regarding the effect of technology on the individual, society, and the environment.
- [3.4.10.E6 \(Advanced\)](#) Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.
- [3.4.10.E7 \(Advanced\)](#) Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

**Unit: 5. Individual Project**

Timeline: Week 10 to 18

**Unit Description:** In the final unit, students will choose one or more projects based on their own level of experience. Students will work their way through the technological process on their own with little support.

**Unit Essential Questions:**

1. How have technological developments impacted devices, processes, and systems for the way we live?
2. How do various areas of technology influence the economy, the environment, and society?
3. How would you apply technological design and problem solving methods in the development of inventions and innovations?
4. What knowledge and skills are essential for humans to make sound decisions about creating, using, and modifying technologies?
5. What is technological literacy?

**Unit Big Ideas:**

1. A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.
2. Each area of technology has a set of characteristics that separates it from others; however, many areas overlap in order to meet human needs and wants.
3. Technological design is a creative process that anyone can do which may result in new inventions and innovations.
4. Technology is created, used and modified by humans.
5. Technological literacy is the ability to use, assess and manage technology around us.

**Unit Materials:**

Safety glasses, safety quizzes, ruler quizzes, stationary power tools, portable power tools, hand tools, a good selection of lumber, screws, glue, nails, clamps, rulers, measurement worksheets, clear wood finish with brushes. Also, any special order materials, hardware, etc. specific for each project.

**Unit Assignments:** Technical drawing, isometric drawing, material list, cost proposal, completed project, "Technological Process" writing assignment.

**Unit Key Terminology & Definitions :**

Technology: the application of scientific knowledge for practical purposes, especially in industry

System: a set of principles or procedures according to which something is done; an organized scheme or method.

Manufacturing: the making of articles on a large scale using machinery; industrial production.

Invention: The act of creating something. Typically a process or device.

Innovation: A new method, product, idea, etc.

Diagnose: To figure out what is wrong by examination of symptoms.

Troubleshoot: To trace and correct faults in a system.

Technical Drawings: A precise and detailed drawing of an object, as employed in architecture or engineering.

Isometric Drawings: A pictorial representation of an object in which all three dimensions are drawn at full scale rather than foreshortening them to the true projection.

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21st century skills: Skills, abilities, and learning dispositions that have been identified as being required for success in society and workplaces by educators, business leaders, academics, and governmental agencies.

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<a href="#">3.4.10.C2 (Advanced)</a>	Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
<a href="#">3.4.10.C3 (Advanced)</a>	Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
<a href="#">3.4.10.D1 (Advanced)</a>	Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.
<a href="#">3.4.10.D2 (Advanced)</a>	Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
<a href="#">3.4.10.D3 (Advanced)</a>	Synthesize data, analyze trends, and draw conclusions regarding the effect of technology on the individual, society, and the environment.
<a href="#">3.4.10.E6 (Advanced)</a>	Illustrate how manufacturing systems may be classified into types such as customized production, batch production, and continuous production.
<a href="#">3.4.10.E7 (Advanced)</a>	Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

(\* standards consolidated from Topic level)

**Topic: 4.1 Project Management**

Minutes for Topic: 88

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

[3.4.10.A2 \(Advanced\)](#) Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.

[3.4.10.B1 \(Advanced\)](#) Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects.

**Topic: 4.2 Project Planning**

Minutes for Topic: 220

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

- [3.4.10.A2 \(Advanced\)](#) Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- [3.4.10.A3 \(Advanced\)](#) Examine how technology transfer occurs when a new user applies an existing innovation developed for one purpose in a different function.
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**Topic: 4.3 Tool Operation**

Minutes for Topic: 220

**STANDARDS**

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- [3.4.10.B2 \(Advanced\)](#) Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.
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**Topic: 4.4 Construction Techniques**

Minutes for Topic: 880

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

- [3.4.10.B3 \(Advanced\)](#) Compare and contrast how a number of different factors, such as advertising, the strength of the economy, the goals of a company and the latest fads, contribute to shaping the design of and demand for various technologies.
- [3.4.10.B4 \(Advanced\)](#) Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
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- [3.4.10.C2 \(Advanced\)](#) Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments.
- [3.4.10.C3 \(Advanced\)](#) Illustrate the concept that not all problems are technological and not every problem can be solved using technology.
- [3.4.10.E7 \(Advanced\)](#) Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

**Topic: 4.5 Project Finish**

Minutes for Topic: 220

**STANDARDS**

STATE: Pennsylvania SAS Academic Standards (2009-2013)

- [3.4.10.A2 \(Advanced\)](#) Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- [3.4.10.B4 \(Advanced\)](#) Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention.
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