Wallenpaupack Area School District
Planned Course Curriculum Guide

Department
CTE

Name of Course
Introduction to Technology and Engineering

Course Description: This course provides students with the opportunity to explore careers in the fields of Engineering and related occupations. Units focus on building a basic understanding of problem solving and design. This course is project based and includes opportunities for students to learn about multiple engineering disciplines, activate cross-curricular knowledge, and participate in problem solving challenges. Activities include sketching, computer-aided 3D design, 3D printing, and hands-on projects.

Long Term Transfer Goals:
Students will be able to independently use their learning to:

- Engage in the problem-solving process.
- Suggest potential solutions to a problem.
- Critically evaluate potential solutions.
- Decide on the most effective solution to a problem.
- Prototype and test that solution.
- Identify and describe potential careers in Engineering, Design, and related technological fields.

Initial Creation Date (if applicable) and Revision Dates:

9/2026

Wallenpaupack Area School District Curriculum	
COURSE: Introduction to Technology and Engineering	**GRADE/S: 9**
UNIT 1: Introduction to the Engineering Design Process	**TIMEFRAME: 5 blocks**

PA COMMON CORE/NATIONAL STANDARDS:

CC.3.6.9-10F: Conduct short, as well as, more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

3.4.12.A1: Compare and contrast the rate of technological development over time.

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Explain what the Engineering Design Process is.
- Explain how technical drawings fit into the design process.
- Explain how one trains to become an engineer, architect, designer, or drafter.
- Describe career prospects and opportunities, including salary ranges, available in the field of drafting.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- Engineering Fundamentals text
- Chapter review questions
- Group and individual activities
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTI (if CTE)
- Rubric assessed assignments

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring
- Grouping with purpose
- Extended time
- Limited response
- Companion website
- Direct instruction
- 3D tangible models

RESOURCES (Technology Based Resources, Text Resources, etc.):

- Engineering Fundamentals textbook
- Teacher designed Schoology resources

KEY VOCABULARY:

- Technical drawing
- Computer Aided Design (CAD)

- Engineer
- Drafter
- Designer
- Architect
- Engineering Technologist

Wallenpaupack Area School District Curriculum	
COURSE: Introduction to Technology and Engineering	**GRADE/S: 9**
PROJECT UNIT: Mechanical Engineering	**TIMEFRAME: 5 blocks**

PA COMMON CORE/NATIONAL STANDARDS:

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Identify and explain key concepts related to physics and the use of a machine.
- Build and modify a model to solve a real-world problem.
- Test the model for effectiveness.
- Record, report, and analyze testing data.
- Describe career prospects and opportunities, including salary ranges, available in the field of mechanical engineering.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- In-class work sessions
- Research sessions
- Engineering notebook
- Design sessions
- Fabrication sessions
- Test sessions
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTE (if CTE)
- Rubric based assessment of Engineering notebook
- Rubric-based assessment of design, process, and testing

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring
- Extended time
- Limited response
- Direct instruction
- Modified grading
- Word processing tools (spell check, thesaurus, etc)
- Exemplars

RESOURCES (Technology Based Resources, Text Resources, etc.):

Research specific to assigned project
Teacher-created Schoology website
Engineering Notebook Template
Project-specific directions and resources
Rubric
Data presentation software
Mechanical tools

KEY VOCABULARY:

- Project-specific terms related to the concepts of Mechanical Engineering
- Historical Research
- Experimental Research
- Predictive Analysis
- Function
- Mechanical Engineering
- Mechanical Engineering Technologist

Wallenpaupack Area School District Curriculum	
COURSE: Introduction to Technology and Engineering	**GRADE/S: 9**
PROJECT UNIT: Design Engineering	**TIMEFRAME: 5 blocks**

PA COMMON CORE/NATIONAL STANDARDS:

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Define the characteristics of a 3D object.
- Explain what 3D printing technologies are and the effect they have or will have on industry and society.
- Explain the process of 3D printing.
- Explain the concept of layers and their role in 3D printing.
- Gain experience utilizing the 3D Design software.
- Utilize the Engineering Design Process to design, produce, and test a 3D printed object.
- Describe career prospects and opportunities, including salary ranges, available in the field of design engineering.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- In-class work sessions
- Research sessions
- Engineering notebook
- Design sessions
- Fabrication sessions
- Test sessions
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTE (if CTE)
- Rubric based assessment of Engineering notebook
- Rubric-based assessment of design, process, and testing

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring
- Extended time
- Limited response
- Direct instruction
- Modified grading
- Word processing tools (spell check, thesaurus, etc)
- Exemplars

RESOURCES (Technology Based Resources, Text Resources, etc.):

Research specific to assigned project
Teacher-created Schoology website
Engineering Notebook Template
Project-specific directions and resources
Rubric
CAD Software (web-based)
3D printers and materials

KEY VOCABULARY:

- Project-specific terms related to the concepts of Design Engineering
- Deposition
- Fusion
- z-axis
- Pan
- Zoom
- Extrude
- Sweep
- Revolve
- Workflow
- Snap Industrial Engineering
- Design Engineering

Wallenpaupack Area School District Curriculum	
COURSE: Introduction to Technology and Engineering	**GRADE/S: 9**
PROJECT UNIT: Environmental Engineering	**TIMEFRAME: 5 blocks**

PA COMMON CORE/NATIONAL STANDARDS:

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Gain experience utilizing solar panels.
- Use sketching to communicate a design concept.
- Assemble, test, refine, and improve a prototype.
- Collect, display, and analyze performance data.
- Describe career prospects and opportunities, including salary ranges, available in the field of environmental engineering.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- In-class work sessions
- Research sessions
- Engineering notebook
- Design sessions
- Fabrication sessions
- Test sessions
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTE (if CTE)
- Rubric based assessment of Engineering notebook
- Rubric-based assessment of design, process, and testing

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring
- Extended time
- Limited response
- Direct instruction
- Modified grading
- Word processing tools (spell check, thesaurus, etc)
- Exemplars

RESOURCES (Technology Based Resources, Text Resources, etc.):

Research specific to assigned project
Teacher-created Schoology website
Engineering Notebook Template
Project-specific directions and resources
Rubric
Data presentation software
Mechanical Tools

KEY VOCABULARY:

- Project-specific terms related to the concepts of Environmental Engineering
- Velocity
- Speed
- Efficiency
- Solar power
- Solar cell
- Aerodynamics
- Environmental Engineering

COURSE: Introduction to Technology and Engineering	GRADE/S: 9
PROJECT UNIT: Aerospace Engineering	TIMEFRAME: 5 blocks

PA COMMON CORE/NATIONAL STANDARDS:

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Gain experience with basic concepts in aerospace engineering.
- Use sketching to communicate a design concept.
- Assemble, test, refine, and improve a prototype.
- Collect, display, and analyze performance data.
- Describe career prospects and opportunities, including salary ranges, available in the field of aerospace engineering.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- In-class work sessions
- Research sessions
- Engineering notebook
- Design sessions
- Fabrication sessions
- Test sessions
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTE (if CTE)
- Rubric based assessment of Engineering notebook
- Rubric-based assessment of design, process, and testing

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring
- Extended time
- Limited response
- Direct instruction
- Modified grading
- Word processing tools (spell check, thesaurus, etc)
- Exemplars

RESOURCES (Technology Based Resources, Text Resources, etc.):

Research specific to assigned project
Teacher-created Schoology website
Engineering Notebook Template
Project-specific directions and resources
Rubric
Data presentation software
Mechanical tools

KEY VOCABULARY:

- Project-specific terms related to the concepts of Aerospace Engineering
- Velocity
- Speed
- Efficiency
- Power
- Lift
- Telemetry
- Rocketry
- Fuel Cell
- Aerodynamics Aerospace Engineering

Wallenpaupack Area School District Curriculum	
COURSE: Introduction to Technology and Engineering	**GRADE/S: 9**
PROJECT UNIT: Civil Engineering	**TIMEFRAME: 5 blocks**

PA COMMON CORE/NATIONAL STANDARDS:

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Gain experience with basic concepts in civil engineering.
- Use sketching to communicate a design concept.
- Assemble, test, refine, and improve a prototype.
- Collect, display, and analyze performance data.
- Describe career prospects and opportunities, including salary ranges, available in the field of civil engineering.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- In-class work sessions
- Research sessions
- Engineering notebook
- Design sessions
- Fabrication sessions
- Test sessions
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTE (if CTE)
- Rubric based assessment of Engineering notebook
- Rubric-based assessment of design, process, and testing

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring

- Extended time
- Limited response
- Direct instruction
- Modified grading
- Word processing tools (spell check, thesaurus, etc)
- Exemplars

RESOURCES (Technology Based Resources, Text Resources, etc.):

Research specific to assigned project
Teacher-created Schoology website
Engineering Notebook Template
Project-specific directions and resources
Rubric
Data presentation software
Mechanical Tools

KEY VOCABULARY:

- Project-specific terms related to the concepts of Civil and Structural Engineering
- Torsion
- Tension
- Live Load
- Static Load
- Lamination Civil Engineering

Wallenpaupack Area School District Curriculum	
COURSE: Introduction to Technology and Engineering	**GRADE/S: 9**
PROJECT UNIT: Electrical/Electronics Engineering	**TIMEFRAME: 5 blocks**

PA COMMON CORE/NATIONAL STANDARDS:

3.4.12.C2: Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

3.4.10.D1: Refine a design by using prototypes and modeling to ensure quality, efficiency, and productivity of a final product.

UNIT OBJECTIVES (SWBATS):

After completing this unit, students should be able to:

- Gain experience with basic concepts in electrical engineering
- Assemble, test, and troubleshoot an electrical prototype.
- Demonstrate ability to utilize basic soldering technique safely. Describe career prospects and opportunities, including salary ranges, available in the field of electrical and electronics engineering.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Classroom presentation and demonstrations
- In-class work sessions
- Research sessions
- Engineering notebook
- Design sessions
- Fabrication sessions

- Test sessions
- Career activity

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

- NOCTE (if CTE)
- Rubric based assessment of Engineering notebook
- Rubric-based assessment of design, process, and testing

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Peer Tutoring
- Extended time
- Limited response
- Direct instruction
- Modified grading
- Word processing tools (spell check, thesaurus, etc)
- Exemplars

RESOURCES (Technology Based Resources, Text Resources, etc.):

Research specific to assigned project
Teacher-created Schoology website
Engineering Notebook Template
Project-specific directions and resources
Rubric
Data presentation software
Mechanical Tools
Soldering station and tools

KEY VOCABULARY:

- Project-specific terms related to the concepts of Electrical and Electronics Engineering
- Electrical
- Electronics
- Flux
- Solder
- Current
- Circuit
- Electrical Engineering
- Electronics Engineering