



# **Wolcott Public Schools**

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Wolcott, Connecticut 06716  
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## **Middle School Curriculum Grade 6 to 8 Technology Education**



*Children are our Future...*

## MIDDLE SCHOOL - TECHNOLOGY EDUCATION

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**Mission Statement:**

*The mission of the Wolcott Public Schools is to develop in each student the knowledge, skills, and attitudes necessary to become a productive member of the community and a contributing member to society.*

**Departmental Philosophy:**

*Technology Education is designed to introduce students to the history, use, and impacts of technology in the world we live in. Students will leave with the understanding of the role of technology in their everyday lives along with the skills which they can apply in the future.*

**Course Description:**

*Technology Education at the middle school level is a hands-on class which allows students to apply themselves through the use of computers, materials, and tools to create a desired output and to solve problems. This course teaches items such as safety in the workshop, career awareness, and basic hands-on skills which students can take away and apply in the real world.*

## ***MIDDLE SCHOOL - TECHNOLOGY EDUCATION***

<b><i>Performance Standards</i></b>	<b><i>Sample Activities</i></b>	<b><i>Assessment Strategies</i></b>	<b><i>Resources</i></b>
<p style="text-align: center;"><b><u>(Grade 6) Intro. To Tech Ed</u></b></p> <p><b><u>Standard # 2: Technological Impacts</u></b></p> <p>2.6.3 Explore and identify the personal effects of technological systems.</p> <p>2.6.4 Describe the universal input, process, output and feedback (IPOF) systems model.</p> <p><b><u>Standard # 6: Materials and Processes</u></b></p> <p>6.6.2 Demonstrate appropriate use and safe operation of basic hand and power tools.</p> <p>6.6.3 Use manual measuring devices accurately.</p> <p>6.6.6 Produce simple products from a variety of materials using manual devices.</p> <p><b><u>Standard # 8: Production Systems</u></b></p> <p>8.6.5 Design, construct and test models of shelters and other structures.</p>	<p>Discussion: Electricity in everyday lives.</p> <ul style="list-style-type: none"> <li>• How much do we rely on it?</li> <li>• Do we take it for granted?</li> <li>• How can we have cleaner ways to produce electricity?</li> <li>• How does the IPOF model relate to turning on a light switch?</li> </ul> <p>Measurement</p> <ul style="list-style-type: none"> <li>• Breakdown of an inch.</li> <li>• Reading a ruler and tape measure.</li> <li>• Measurement worksheets.</li> <li>• Applying measurement in projects.</li> </ul> <p>Small projects.</p> <ul style="list-style-type: none"> <li>• Safety lessons and demonstrations.</li> <li>• Appropriate use of tools in the workshop.</li> </ul> <p>Design, construct, and test models of structures.</p> <ul style="list-style-type: none"> <li>• Balsa wood bridges</li> <li>• Paper tower lesson</li> <li>• Balsa wood towers</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Written list of all electrical items student used so far that day,</li> <li>• Written list of all electrical items students think they will use later that day.</li> <li>• Fill in the blanks for different IPOF models.</li> </ul> <ul style="list-style-type: none"> <li>• Measurement worksheet for homework.</li> <li>• Measurement included on a quiz.</li> <li>• Rubrics to measure student performance on safety, measurement, accuracy, and effort while working on small projects.</li> </ul> <ul style="list-style-type: none"> <li>• Weight test to measure the amount of weight each structure held.</li> <li>• Quiz on trusses, pillars and columns.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Introduction to Technology</u> Chapter 1: Why Study Technology?</li> </ul> <ul style="list-style-type: none"> <li>• <u>Technology Education Learning by Design</u> Chapter7, Section 4: Combining and Conditioning Processes</li> </ul> <ul style="list-style-type: none"> <li>• <u>Introduction to Technology</u> Chapter 18: The World of Construction</li> </ul>

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<p><b><u>(Grade 6) Intro. To Tech Ed</u></b> <b><u>(Continued)</u></b></p> <p><b><u>Standard # 11: Engineering Design</u></b> 11.6.1 Identify the elements of design.</p>	<p>Identify elements of design</p> <ul style="list-style-type: none"><li>• Balsa wood bridges-(trusses)</li><li>• Paper tower lesson-(pillars/column)</li></ul>		

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<i>Performance Standards</i>	<i>Sample Activities</i>	<i>Assessment Strategies</i>	<i>Resources</i>
<p><b><u>(Grade 7) CADD and Drafting</u></b></p> <p><b><u>Standard # 3: Career Awareness</u></b> 3.7.3 Identify some clear career options you are not interested in pursuing.</p> <p><b><u>Standard # 4: Problem Solving/Research and Development</u></b> 4.7.3 Conduct an applied research problem.</p>	<p>Research careers in the field of CADD and Drafting.</p> <ul style="list-style-type: none"> <li>• How is math applied in these careers?</li> <li>• Research architects and engineers and discuss their roles in the planning stage of a project.</li> </ul> <p>Design a floor plan for a building which includes all required criteria.</p> <ul style="list-style-type: none"> <li>• Research dimensions for a given object or room (example a basketball court).</li> <li>• Use the results from the research to help with the design for the building.</li> <li>• Apply labels and dimensions to the drawing to verify the results from research.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Written assessment on the results from their research.</li> </ul> <ul style="list-style-type: none"> <li>• Rubric to assess the drawing for accuracy, time and effort, and student demonstration of their understanding of CADD.</li> </ul>	<ul style="list-style-type: none"> <li>• Internet/Media publications</li> <li>• CT Department of labor</li> <li>• Bureau of labor statistics</li> </ul> <ul style="list-style-type: none"> <li>• CADD Program</li> <li>• Internet (research)</li> </ul>

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<p><b><u>(Grade 7) CADD and Drafting</u></b> (Continued)</p> <p><b><u>Standard # 11: Engineering Design</u></b></p> <p>11.7.2 Explain the role of creativity in the engineering design process.</p> <p>11.7.3 Use a variety of creativity enhancing techniques in conceptual design situations.</p> <p>11.7.6 Develop preliminary product layouts.</p>	<p>Sample hand and computer aided drafting problems.</p> <ul style="list-style-type: none"> <li>• Orthographic drawings.</li> <li>• Isometric drawings.</li> </ul> <p>Sample floor plan drawings.</p>	<ul style="list-style-type: none"> <li>• Rubrics used with class work drawings measuring student performance.</li> <li>• Quizzes where the students will define drafting terminology and complete drawings.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Exploring Drafting</u> Unit 4: Drafting Equipment Unit 5: Drafting Techniques Unit 16: Design</li> </ul>

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<p><b><u>(Grade 8) Applied Technology</u></b></p> <p><b><u>Standard # 3: Career Awareness</u></b></p> <p>3.8.1 Identify and categorize careers associated with the CT Career Clusters in which you are interested.</p> <p>3.8.7 Explore career options.</p> <p><b><u>Standard # 4: Problem Solving/Research and Development</u></b></p> <p>4.8.1 Apply technological systems to solve a posed problem.</p> <p>4.8.4 Apply a general problem-solving model including research techniques to invent a product.</p>	<p>Research and identify careers associated with industry and trades fields.</p> <ul style="list-style-type: none"> <li>• Identify hands-on careers and the need for them.</li> <li>• Identify careers which students might want to pursue and why they want to pursue them.</li> </ul> <p>Simple Machines</p> <ul style="list-style-type: none"> <li>• Identify how each of the simple machines helps to make work easier.</li> <li>• Identify how the placement of a fulcrum helps a lever to work.</li> <li>• Invent a machine using two of the simple machines that is capable of raising a load of 2lbs. a distance of 3 in. high that has the least amount of input force.</li> </ul>	<ul style="list-style-type: none"> <li>• Written report answering a series of questions.</li>   <li>• Quiz on the six simple machines.</li> <li>• Rubric to assess the machine project. There are size limitations and rules that students must follow when constructing this machine.</li> </ul>	<ul style="list-style-type: none"> <li>• Internet/Media publications</li> <li>• Bureau of labor statistics</li>   <li>• <u>Motion, Forces and Energy</u> Chapter 4, section 4-4: Simple and Compound Machines</li> </ul>

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<p style="text-align: center;"><b><u>(Grade 8) Applied Technology</u></b> (Continued)</p> <p><b><u>Standard # 6: Materials and Processes</u></b> 6.8.1 Participate in a manufacturing activity.</p> <p><b><u>Standard # 9: Transportation Systems</u></b> 9.8.2 Design, build, and test model marine, space, land, and air transportation systems and report on results.</p>	<p>Name Plaque Project</p> <ul style="list-style-type: none"> <li>• Safe working habits need to be displayed.</li> <li>• Demonstrate proper use of hand saws, file and sanders are exhibited.</li> <li>• Demonstrate proper use of power tools such as scroll saws and drill presses.</li> </ul> <p>Mousetrap racecar construction.</p> <ul style="list-style-type: none"> <li>• Students will work in groups to design and construct a mousetrap racecar.</li> <li>• Potential and kinetic energy will be discussed.</li> <li>• Calculations will be used to determine the speed of each car.</li> </ul>	<ul style="list-style-type: none"> <li>• A safety quiz will be given before any construction begins. This quiz will cover basic workshop safety.</li> <li>• Rubrics are used to assess safe working habits along with proper tool usage, and neatness throughout the project.</li> </ul> <ul style="list-style-type: none"> <li>• Rubric will be used to assess student performance in the group and the overall design of the car.</li> <li>• A quiz will be given to assess the understanding of speed and energy.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Technology Education Learning by Design</u> Chapter 5, Section 2: Energy, Materials, Tools and Machines</li> </ul> <ul style="list-style-type: none"> <li>• <u>Technology Education Learning by Design</u> Chapter 15: Transportation</li> </ul>



# ***MIDDLE SCHOOL - TECHNOLOGY EDUCATION***

## **Pacing Guide**

### **SIXTH GRADE:**

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#### Class 1:

- Introduction to the course. Rules, expectations, course and unit organizers.
- Discussion: What is technology, and how does technology effect everyday life?

#### Class 2:

- Measurement lesson. Breakdown of an inch into smaller fractions.
- Reading a ruler and tape measure.
- Practice measuring sample objects of different sizes.
- Homework: Scale Readings measurement readings worksheet.

#### Class 3:

- Review homework and answer any questions.
- Introduce forces and structures. Discuss principles behind columns and pillars.
- Introduce applied measurement and structure activity: paper tower structures.
- Students will work in groups to design a structure out of one piece of paper and masking tape that will support the weight of textbooks. The structure must meet height requirements.

#### Class 4:

- Finish constructing paper towers.
- Test the structures by placing textbooks on the towers until they are crushed. Then weigh the textbooks using a scale. Examine the towers to see the construction. Why did the one that held the most weight work so well? Why did the one that held the least amount of weight not work so well?
- Through this activity, students must apply measurement, work in groups, and use limited amounts of material to create a product to complete a task.

#### Class 5:

- Introduce basic hand and power tool safety.
- Demonstrate the proper way to use basic hand tools.
- Review for quiz next class.

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### Class 6:

- Quiz: measurement, columns, and shop safety.
- Introduce woodshop project and project description sheets. The project description sheets are similar to directions, only the students must write a list of all of the materials, tools, and procedures they use to make their projects. These sheets will be passed out every class and the students will document each step they take in completing their project. When they leave at the end of the marking period, they will have a project and also instructions on how to make the project.
- Begin construction.
- Reinforce the importance of measurement throughout the construction. Measure twice, cut once.

### Class 7:

- Pass back and review quizzes.
- Continue construction of projects but stopping periodically to demonstrate the next step in the project.

### Class 8:

- Wood properties lesson. Distinguish different types of wood and some properties and uses of each.
- Assess where students are in the construction of their projects, explain the next step, and continue construction.

### Class 9:

- Fasteners lesson. Distinguish between different fasteners such as threaded, non-threaded, adhesives and concrete.
- Review for quiz next class.
- Continue construction.

### Class 10:

- Quiz: wood properties and fasteners.
- Continue construction on projects.

### Class 11:

- Introduce finishing processes such as sanding and painting.
- Begin finishing processes on construction projects.

### Class 12:

- Complete finishing projects.
- Projects should be completed and ready for grading.
- Class work/homework: Electricity worksheet.

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### Class 13:

- Review homework and answer any questions.
- Pass back graded projects.
- Review all the steps used to complete the project description sheets.

### Class 14:

- Video: Technology in Action the milling of hard wood and softwood.

### Class 15:

- Wrap-up of the marking period.
- Review major concepts such as measurement, safety, and the proper use of tools covered this marking period.
- Answer any questions students may have.
- Go over what to expect for seventh grade Tech Ed.

# ***MIDDLE SCHOOL - TECHNOLOGY EDUCATION***

## **Pacing Guide**

### **SEVENTH GRADE:**

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#### Class 1:

- Introduction to CADD and Drafting.
- Review of rules and expectations.
- Distribute course/unit organizers.
- Review of measurement and its importance in drafting (dimensions).

#### Class 2:

- Discuss some basic drafting terms and definitions.
- Introduce some basic mathematical principles that apply to drafting. Some of these include measurement, radius and diameter.
- Introduction to hand drafting techniques and tools such as a compass, ruler, scale, and protractor.
- Begin sample drawing #1 on graph paper.

#### Class 3:

- Review some hand drafting techniques.
- Complete sample drawing #1.
- Introduce and work on sample drawing # 2 on graph paper.

#### Class 4:

- Introduction to CADD
- Students will be assigned computers and shown how to draw, dimension, modify, and save drawings.
- Begin sample drawing # 3 (orthographic drawings) on the computer and save work.

#### Class 5:

- Review basic drawing tools on CADD and answer any questions.
- Continue and finish sample drawing # 3 and save work.
- Review for quiz next class.

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### Class 6:

- Quiz: Drafting terms and dimensions.
- Introduce and work on sample drawing # 4 (isometric drawings) on CADD.
- Save work at the end of the period.

### Class 7:

- Pass back quizzes and answer any questions.
- Introduce floor plans and drawing scales.
- As a class, create a floor plan of the CADD lab by taking measurements of the room and then drawing it on the computer. Save as “Sample floor plan.”

### Class 8:

- Introduce the floor plan project. Here students will be given an open-ended problem where they must design a floor plan using the computer. The students will be given certain criteria which they must be shown in their floor plan. This project will also use the internet for research to find certain dimensions of items to be included in the floor plan.
- Complete drawing # 4 if not done.
- Begin research and design of the floor plan project.

### Class 9:

- Review criteria for floor plan projects.
- Students will work independently on floor plan projects.
- Teacher will monitor and assist individual needs.
- Save work at end of the period.

### Class 10:

- Students will continue work on the floor plan project.
- Teacher will monitor and assist with individual needs.
- Save work at end of the period.

### Class 11:

- Teacher demonstration: Labeling the rooms. Here the students will be shown how to label and dimension the rooms in their floor plan.
- Students will apply begin to finish drawing, labeling, and dimensioning.
- Teacher will assist with individual needs.
- Save work at the end of the period.

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### Class 12:

- Careers in the field of CADD and Drafting.
- Students will research some of the careers associated with drafting, architecture, and engineering.
- A discussion will follow.

### Class 13:

- Students will complete and print floor plan projects to be graded.

### Class 14:

- Graded projects will be passed back and reviewed.
- Students will participate in a quick hand drawn floor plan activity on graph paper.

### Class 15:

- Wrap up the marking period and review major concepts of drafting and careers associated with drafting.
- Discuss what to expect for eighth grade Tech Ed.

# *MIDDLE SCHOOL - TECHNOLOGY EDUCATION*

## **Pacing Guide**

### **EIGHTH GRADE:**

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#### Class 1:

- Introduction to the course.
- Review rules, expectations, course and unit organizers.
- Review some hand tool safety learned in sixth grade.

#### Class 2:

- Machine demonstration of the scroll saws and drill press. Discuss safe working procedures with each machine.
- Introduction to name plaque projects. Students will begin to hand sketch design for projects on graph paper.
- Safety quiz next class.

#### Class 3:

- Safety quiz.
- Finish hand sketching design for name plaques.
- Begin to transfer sketches onto blocks of wood.

#### Class 4:

- Hand back graded quizzes and review them.
- Answer any questions.
- Finish transferring sketches to wood.
- Begin cutting using scroll and hand saws.

#### Class 5:

- Quick review of safety around the machines.
- Students will work on projects for the period.

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### Class 6:

- Simple machines lesson. Here students will be introduced to the six simple machines and how they help to make work easier.
- Students will be given demonstrations of the use of the six simple machines and how they can be found in more complex machines which we might use in everyday life.
- Continue work on name plaques for the remainder of the period.

### Class 7:

- Two and four cycle engine lesson.
- After talking about the simple machines, we will discuss some more complex machines.
- We will look at some major similarities and differences of each engine and some uses of each.
- The major point of the engine lesson is for the students to understand how the machine works, and to understand about the maintenance that goes along with an engine whether it is a small gas engine or a car.

### Class 8:

- Review major characteristics of two and four cycle engines.
- Continue work on the name plaque project.
- Simple machine and engine quiz next class.

### Class 9:

- Machine and engine quiz.
- Continue and begin to complete name plaque project.

### Class 10:

- Pass back and review quizzes.
- Introduce and discuss some career options in industry and the trades' fields.
- Students will then go into the computer lab, where they will research three careers of interest and write a paragraph on each. Included in this paragraph will be information about how one can pursue this occupation and also some information on exactly what jobs are in these fields.

### Class 11:

- Students will finish any research on careers.
- A class discussion will take place to share information from the research.



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### Class 12:

- Students should be using this class for any finishing touches to the name plaques before turning them in to be graded.
- As students finish the name plaques, they will begin working in small groups to design and construct a mouse trap racecar.
- The supplies for each group will already be divided up to allow for more construction time.

### Class 13:

- A brief teacher demonstration about the placement of the mouse trap (the power source) on the car will take place. This saves students from moving the mouse traps many times.
- A quick review of potential and kinetic energy and how it relates to the spring on the mouse trap.
- Student construction for the remainder of the period.

### Class 14:

- Pass back graded name plaques and answer any questions.
- Students should be completing construction of mouse trap racecars.
- Once construction is complete, students will be shown how to calculate speed. Speed is equal to distance over time.
- We will race each car three times, recording the distance in feet and time in seconds.
- In their groups, students should find their speed for each race.

### Class 15:

- Finish any races not completed last class.
- Wrap up for the marking period and middle school Tech Ed.

# ***MIDDLE SCHOOL - TECHNOLOGY EDUCATION***

## **Essential Questions**

1. Define Technology.
2. Describe safe working habits while in the woodshop.
3. Identify the six simple machines.
4. Describe how the IPOF systems model relates to a computer.
5. How is applying measurement crucial to a project's outcome?
6. How would you design a better mousetrap racecar?
7. What would you predict for the future of technology?
8. What solution would you suggest for a new architect, traditional hand drafting or a CADD program? Why?

# ***MIDDLE SCHOOL - TECHNOLOGY EDUCATION***

## **Skills Objectives**

### **The students will be able to:**

1. Accurately measure materials for a project and be able to accurately read a ruler.
2. Demonstrate safe working habits while in the workshop.
3. Draw scale 3 view drawings of an object. (front, top, and right side)
4. Apply basic drafting skills to complete sample drawings.
5. Design and create a basic floor plan of a room using a CADD program.
6. Identify different career choices in the trades and industry fields.
7. Use a variety of hand and power tools to construct a small project.
8. Define work, and how the use of the simple machines makes work easier.

# ***MIDDLE SCHOOL - TECHNOLOGY EDUCATION***

## **Assessments**

[That are aligned to the curriculum – this will be done through the data teams throughout the year – no need to do them now, I just wanted to let you know where they will go in the curriculum, as we complete them. Thank.]