

Geneva CUSD 304
Content-Area Curriculum Frameworks
Grades 6-12
Industrial Technology

Mission Statement	<p>As an industrial technology department our mission is:</p> <p>To motivate all students to develop problem solving skills that will promote creative thinking and create a safe working environment.</p> <p>To teach all students the proper and safe manner to use tools and equipment to learn and use practical life skills through a variety of hands on activities.</p>
Course Sequence (Grades 6-12)	<p>Computer Aided Drafting I: Open to all students 9 - 12th grade students.</p> <p>Computer Aided Drafting II: Open to all 9 - 12th grade students who successfully complete CAD I.</p> <p>Computer Aided Drafting III: Open to 10 - 12th grade students who successfully complete CAD II.</p> <p>Computer Aided Drafting IV: Open to 10 - 12th grade students who successfully complete CAD III.</p> <p>Architectural Drafting: Open to all 9-12th grade students who successfully complete CAD I.</p> <p>Woods I: Open to all 9 - 12th grade students.</p> <p>Woods II: Open to all 9 – 12th grade students who successfully complete Woods I.</p> <p>Woods III: Open to all 10 –12th grade students who successfully complete Woods II and have a pre-approved project from the instructor.</p> <p>Woods IV: Open to all 10 – 12th grade students who successfully complete Woods II and have a pre-approved project from the instructor.</p> <p>Industrial Technology: Open to all 9 – 12th grade students</p>

Course Framework

Course Title Grade Level Semesters (1-2-3-4) Prerequisite	Industrial Technology 9 - 12 None
Course Description	This course is designed to give students some insight into selected areas of industrial technology and to provide hands on applied experiences in the areas of communication, transportation, energy and production (Illinois Plan). Instruction will be delivered through the use of Modular Technology Education (MTE) units; students will work in pairs to complete each of the MTE programs. Students will rotate through different modules including 3D Modeling, 4 Stroke Engines, CNC Lathe, CNC Mill, Residential Wiring, Non Linear Video Production, Flight Simulator, Graphic Design, Plastics, and Robotics. Students will explore each MTE in hopes of identifying career areas that they may wish to specialize in later. (VALEES #I125)
District-approved Materials and/or Resources	Engineer structure software Bridge builder Depco Class Plus

Unit of Study: major topics	Engineering Structures	Resources that will support instruction
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**Illinois Learning
Standards, Benchmarks,**

1.A Apply word analysis and vocabulary skills to comprehend selections.
1.A.3b Analyze the meaning of words and phrases in their context.
1.B.3d Read age-appropriate material with fluency and accuracy.
1.B.4c Read age-appropriate material with fluency and accuracy.
1.B.5d Read age-appropriate material with fluency and accuracy.
26.A.4d
Music: Demonstrate the ability to read written notation for a vocal or instrumental part.
26.B.3d Visual Arts: Demonstrate knowledge and skills to create 2- and 3-dimensional works and time arts (e.g., film, animation, video) that are realistic, abstract, fun.
10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.
10.C.4b
Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology.
7.B.5
Estimate perimeter, area, volume, and capacity of irregular shapes, regions and solids and explain the reasoning supporting the estimate.
7.C.4c
Convert within and between measurement systems and monetary systems using technology where appropriate.
7.C.5a
Use dimensional analysis to determine units and check answers in applied measurement problems.
7.C.5b
Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved).
8.A.4a Use algebraic methods to convert repeating decimals to fractions.
8.D.5
Formulate and solve nonlinear equations and systems including problems involving inverse variation and exponential and logarithmic growth and decay.
9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern. Science
11.A.3c
Collect and record data accurately using consistent measuring and recording techniques and media.
11.A.3g
Report and display the process and results of a scientific investigation.
11.A.4c Collect, organize and analyze data accurately and precisely.
11.B
Know and apply the concepts, principles and processes of technological design.
11.B.3b
Sketch, propose and compare design solutions to the problem considering available materials,

Unit Frameworks

Unit of Study: major topics	Robotics	Resources that will support instruction
Illinois Learning Standards, Benchmarks,	<p>1.A Apply word analysis and vocabulary skills to comprehend selections.</p> <p>1.A.3b Analyze the meaning of words and phrases in their context.</p> <p>1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings).</p> <p>1.B.3d Read age-appropriate material with fluency and accuracy.</p> <p>1.B.4c Read age-appropriate material with fluency and accuracy.</p> <p>1.B.5d Read age appropriate material with fluency and accuracy.</p> <p>1.C.3f Interpret tables that display textual information and data in visual formats.</p> <p>1.C.4f Interpret tables, graphs and maps in conjunction with related text.</p> <p>10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatter plots and box plots.</p> <p>10.C.4b Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology.</p> <p>7.C.5a Use dimensional analysis to determine units and check answers in applied measurement problems.</p> <p>7.C.5b Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved).</p> <p>8.A.4a Use algebraic methods to convert repeating decimals to fractions.</p> <p>8.D Use algebraic concepts and procedures to represent and solve problems.</p> <p>9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern.</p> <p>9.A.4b Make perspective drawings, tessellations and scale drawings, with and without the use of technology.</p> <p>9.C.4b Construct and communicate convincing arguments for geometric situations.</p> <p>9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.</p> <p>Science</p> <p>11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.</p> <p>11.A.4c Collect, organize and analyze data accurately and precisely.</p> <p>11.B Know and apply the concepts, principles and processes of technological design.</p> <p>11.B.3b Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness and safety.</p> <p>11.B.3c Select the most appropriate design and build a prototype or simulation.</p>	

	<p>11.B.3d Test the prototype using available materials, instruments and technology and record the data.</p> <p>11.B.3e Evaluate the test results based on established criteria, note sources of error and recommend improvements.</p> <p>11.B.4e Develop and test a prototype or simulation of the solution design using available materials, instruments and technology.</p> <p>11.B.4f Evaluate the test results based on established criteria, note sources of error and recommend improvements.</p> <p>11.B.5c Build and test different models or simulations of the design solution using suitable materials, tools and technology.</p> <p>11.B.5d Choose a model and refine its design based on the test results.</p> <p>11.B.5e Apply established criteria to evaluate the suitability, acceptability, benefits, drawbacks and consequences for the tested design solution and recommend modification</p> <p>12.D.5b Analyze the effects of gravitational, electromagnetic and nuclear forces on a physical system.</p> <p>13.B.5e Assess how scientific and technological progress has affected other fields of study, careers and job markets and aspects of everyday life.</p>
Objectives	<p>Identify the major parts of a robot system.</p> <p>Locate the parts of robot.</p> <p>Further develop manipulative skills with the robot.</p> <p>Set and use the positions of the robot arm.</p> <p>Identify some of the hazardous tasks for which robots are used.</p> <p>Describe the Cartesian coordinate system used by the Scorbot.</p> <p>Design a simple flow chart.</p> <p>Identify uses for speed control and pauses.</p> <p>Apply your programming skills to solve a problem.</p>
Assessments	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>

Unit Frameworks

(One set for unit)

Unit of Study: major topics	Flight Transportation	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	<p>1.A Apply word analysis and vocabulary skills to comprehend selections.</p> <p>1.A.3b Analyze the meaning of words and phrases in their context.</p> <p>1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings).</p> <p>1.B.3d Read age-appropriate material with fluency and accuracy.</p> <p>1.B.4c Read age-appropriate material with fluency and accuracy.</p> <p>1.B.5d Read age-appropriate material with fluency and accuracy.</p> <p>3.C Communicate ideas in writing to accomplish a variety of purposes.</p> <p>10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box plots.</p> <p>10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.</p> <p>10.C.4b Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology.</p> <p>10.C.5b Compute probabilities in counting situations involving permutations and combinations.</p> <p>6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.</p> <p>8.C Solve problems using systems of numbers and their properties.</p> <p>9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern.</p> <p>9.C.4b Construct and communicate convincing arguments for geometric situations.</p> <p>9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.</p> <p>12.D.4b Describe the effects of electromagnetic and nuclear forces including atomic and molecular bonding, capacitance and nuclear reactions.</p> <p>12.D.5a Analyze factors that influence the relative motion of an object (e.g., friction,</p>	

	<p>wind shear, cross currents, potential differences).</p> <p>12.D.5b Analyze the effects of gravitational, electromagnetic and nuclear forces on a physical system.</p>	
<p>Objectives (What will students know and be able to do as a result of their learning?)</p> <ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	<p>Discuss aspects of the history of flight</p> <p>Discuss the aerodynamic principles of flight</p> <p>Understand the primary controls for aircraft.</p> <p>Learn and perform basic preflight checks</p> <p>Learn the instruments and controls of an aircraft</p> <p>Learn and perform basic straight and level flight</p> <p>Demonstrate the principles of a coordinated turn</p> <p>Perform a coordinated two-minute turn</p> <p>Explain Headings or directions of travel</p> <p>Explain the importance of maintaining altitude control</p> <p>Explain the meanings of trim and angle of attack and how to apply them</p> <p>Perform various flight maneuvers using this new knowledge</p> <p>Explain what constitutes a good take off</p> <p>Explain what constitutes and good landing</p> <p>Understand the purpose of a flight pattern</p> <p>Study an assigned flight pattern</p> <p>Discuss various wind events</p> <p>Explain stalls and spins</p> <p>Discuss the effects of weather on flight</p> <p>Discuss the problems associated with unusual light conditions</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

apply the essential skills?)		
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Unit Frameworks
(One set for unit)

Unit of Study: major topics	Global Positioning Systems	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	<p>1A Apply word analysis and vocabulary skills to comprehend selections.</p> <p>1.A.3b Analyze the meaning of words and phrases in their context.</p> <p>1.B.3d Read age-appropriate material with fluency and accuracy.</p> <p>1.B.4c Read age-appropriate material with fluency and accuracy.</p> <p>1.B.5d Read age-appropriate material with fluency and accuracy.</p> <p>1.C.4c</p> <p>Interpret, evaluate and apply information from a variety of sources to other situations (e.g., academic, vocational, technical, personal).</p> <p>3.B Compose well-organized and coherent writing for specific purposes and audiences.</p> <p>10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.</p> <p>10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.</p> <p>10.C.4b</p> <p>Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology.</p> <p>10.C.5b Compute probabilities in counting situations involving permutations and combinations.</p> <p>6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.</p> <p>7.C.5a Use dimensional analysis to determine units and check answers in applied measurement problems.</p> <p>7.C.5b</p> <p>Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved).</p> <p>8.A.4a Use algebraic methods to convert repeating decimals to fractions.</p> <p>8.C Solve problems using systems of numbers and their properties.</p> <p>8.D Use algebraic concepts and procedures to represent and solve problems.</p> <p>9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern.</p> <p>9.C.4b Construct and communicate convincing arguments for geometric situations.</p>	

	<p>9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.</p> <p>11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.</p> <p>11.A.4c Collect, organize and analyze data accurately and precisely.</p>	
<p>Objectives (What will students know and be able to do as a result of their learning?)</p> <ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	<p>Describe early navigational techniques</p> <p>Identify early navigational tools</p> <p>Understand how latitude and longitude are determined</p> <p>Locate the sun and moon phases using GPS receiver</p> <p>Understand the technology that makes GPS work</p> <p>Locate towns and their location on a map</p> <p>Use the index and map legend to identify features and populations of areas</p> <p>Understand and use trilateration techniques</p> <p>Launch and navigate the MapSource software</p> <p>Identify the tools required to operate the software</p> <p>Understand how to find geographic coordinates</p> <p>Understand and operate a GPS receiver</p> <p>Use the GPS receiver to identify waypoints</p> <p>Understand and define the elements of precision farming</p> <p>Identify crop yield throughout a field</p> <p>Understand different ways GPS is used for transportation and recreation</p> <p>Solve a crime using the clues supplied and file a report</p> <p>Plan a trip using the atlas, the software, and the GPS receiver</p> <p>Create waypoints, a map, and a route to download</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

skills?)

Unit Frameworks
(One set for unit)

Unit of Study: major topics	Graphic Design	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	1.A Apply word analysis and vocabulary skills to comprehend selections. 1.A.3b Analyze the meaning of words and phrases in their context. 1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings). 1.B.3d Read age-appropriate material with fluency and accuracy. 1.B.4c Read age-appropriate material with fluency and accuracy. 1.B.5d Read age-appropriate material with fluency and accuracy. 3.B.4b Produce, edit, revise and format work for submission and/or publication (e.g., manuscript form, appropriate citation of sources) using contemporary technology. 3.C Communicate ideas in writing to accomplish a variety of purposes. 3.C.3a Compose narrative, informative, and persuasive writings (e.g., in addition to previous writings, literature reviews, instructions, news articles, correspondence) 3.C.3b Using available technology, produce compositions and multimedia works for specified audiences. 3.C.4b Using available technology, produce compositions and multimedia works for specified audiences. 3.C.5a Communicate information and ideas in narrative, informative and persuasive writing with clarity and effectiveness in a variety of written forms. 7.C.5a Use dimensional analysis to determine units and check answers in applied measurement problems. 7.C.5b Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved) 8.A.4a Use algebraic methods to convert repeating decimals to fractions. 11.B Know and apply the concepts, principles and processes of technological design.	
Objectives (What will students know and	Define graphic design Recognize graphic designs in your daily life	

<p>be able to do as a result of their learning?)</p> <ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	<p>Identify basic CorelDRAW tools Use the Zoom, Pan, Rectangle, and Outline tools Create basic shapes Use the freehand, ellipse, spiral, and rectangle tools Copy, paste, duplicate, and rotate objects Use keyboard shortcuts for file menu commands Create a series of lines and curves using the Bezier tool Group and ungroup objects Create a graph Identify primary, secondary, and tertiary colors Create matching color combinations Use color fills Explain basic rules of good typography Experiment with fonts, sizes, and styles Use the Artistic Media Tool Demonstrate the fading of two colors using Fountain Fill Tool Explore pattern and texture fill tools Import graphics from other software Create thumbnail sketches Open a saved drawing Complete a design of your own that you can proudly display on a T-shirt</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

Unit Frameworks

(One set for unit)

Unit of Study: major topics	Landscape design	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	1.A Apply word analysis and vocabulary skills to comprehend selections. 1.A.3b Analyze the meaning of words and phrases in their context. 1.B.3d Read age-appropriate material with fluency and accuracy. 1.B.4c Read age-appropriate material with fluency and accuracy. 1.B.5d Read age-appropriate material with fluency and accuracy. 4.B Speak effectively using language appropriate to the situation and audience. 10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots. 10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology. 10.C.5b Compute probabilities in counting situations involving permutations and combinations. 6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable. 8.C Solve problems using systems of numbers and their properties	
Objectives (What will students know and be able to do as a result of their learning?) <ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	Discuss how landscaping is part of the ornamental horticulture industry Explain how landscaping focuses on the beautification of outdoor terrain, while combining the principle of art and science of growing plants. Discuss the three components of landscape design: the client, the site and the designer Understand and define hardscapes and softscapes Explain the elements of design, color, form, line, scale, and texture Understand the principles of design Explain how to select plants according to a client's needs Discuss the possible roles of plants in a landscape design Learn about the maintenance needs of landscapes	

	<p>Explain the purpose of adding lights to a landscape design Use software to create a two-dimensional drawing of a landscape design Explain the purpose of a proposal and a quote for a landscape design</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

Unit Frameworks

(One set for unit)

Unit of Study: major topics	Meteorology	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	<p>1.A Apply word analysis and vocabulary skills to comprehend selections.</p> <p>1.A.3b Analyze the meaning of words and phrases in their context.</p> <p>1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings).</p> <p>1.B.3d Read age-appropriate material with fluency and accuracy.</p> <p>1.B.4c Read age-appropriate material with fluency and accuracy.</p> <p>1.B.5d Read age-appropriate material with fluency and accuracy.</p> <p>1.C.3f Interpret tables that display textual information and data in visual formats.</p> <p>1.C.4f Interpret tables, graphs and maps in conjunction with related text.</p> <p>3.C Communicate ideas in writing to accomplish a variety of purposes.</p> <p>4.A Listen effectively in formal and informal situations.</p> <p>4.A.4a Apply listening skills as individuals and members of a group in a variety of settings (e.g., lectures, discussions, conversations, team projects, presentations)</p> <p>4.A.4b Apply listening skills in practical settings (e.g., classroom note taking, interpersonal conflict situations, giving and receiving directions, evaluating persuasive</p> <p>10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.</p> <p>10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.</p> <p>10.C.5b Compute probabilities in counting situations involving permutations and combinations.</p> <p>6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.</p> <p>6.D Solve problems using comparison of quantities, ratios, proportions and percents.</p> <p>6.D.3 Apply ratios and proportions to solve practical problems.</p> <p>8.B.5 Use functions including exponential, polynomial, rational, parametric, logarithmic, and trigonometric to describe numerical relationships.</p> <p>8.C Solve problems using systems of numbers and their properties.</p> <p>8.D Use algebraic concepts and procedures to represent and solve problems.</p>	

	<p>8.D.4 Formulate and solve linear and quadratic equations and linear inequalities algebraically and investigate nonlinear inequalities using graphs, tables, and calculators</p> <p>8.D.5 Formulate and solve nonlinear equations and systems including problems involving inverse variation and exponential and logarithmic growth and decay.</p> <p>9.A Demonstrate and apply geometric concepts involving points, lines, planes and space.</p> <p>9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern.</p> <p>9.C.3a Construct, develop and communicate logical arguments (informal proofs) about geometric figures and patterns.</p> <p>9.C.3b Develop and solve problems using geometric relationships and models, with and without the use of technology.</p> <p>9.C.4b Construct and communicate convincing arguments for geometric situations.</p> <p>9.C.4c Develop and communicate mathematical proofs (e.g., two-column, paragraph, indirect) and counter examples for geometric statements.</p> <p>9.C.5a Perform and describe an original investigation of a geometric problem and verify the analysis and conclusions to an audience.</p> <p>9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.</p> <p>9.D.5 Analyze and solve problems involving periodic patterns (e.g., sound waves, tide variations) using circular functions and communicate results orally and in writing.</p> <p>11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.</p> <p>11.A.4c Collect, organize and analyze data accurately and precisely.</p> <p>12.D.4b Describe the effects of electromagnetic and nuclear forces including atomic and molecular bonding, capacitance and nuclear reactions.</p> <p>12.D.5a Analyze factors that influence the relative motion of an object (e.g., friction, wind shear, cross currents, potential differences).</p> <p>12.D.5b Analyze the effects of gravitational, electromagnetic and nuclear forces on a physical system.</p>
<p>Objectives (What will students know and be able to do as a result of their learning?)</p>	<p>Identify the major components of the Davis Wireless Weather Station</p> <p>Launch the Weatherlink software and record your first weather station readings</p> <p>Define temperature</p> <p>Explain different conditions that affect temperature</p> <p>Convert Fahrenheit and Celsius temperature scales</p> <p>Define pressure</p>

<ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	<p>Understand a brief history of barometers</p> <p>Create and measure pressure changes in Microclimates</p> <p>Understand the origins of surface winds</p> <p>Learn about anemometers</p> <p>Construct an anemometer</p> <p>Measure wind speed with your anemometer</p> <p>Define relative humidity</p> <p>Describe humidity sensors called hygrometers</p> <p>Describe what produces thunder, lightning, and tornados</p> <p>Know the nature of fronts, air masses, and storm cells</p> <p>Recognize and understand the Fujita-Pearson scale</p> <p>Observe and analyze data on the temperature, pressure, and relative humidity</p> <p>Understand what heat index and wind chill readings are.</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

Unit Frameworks

(One set for unit)

Unit of Study: major topics	CNC Lathe	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	1.A Apply word analysis and vocabulary skills to comprehend selections. 1.A.3b Analyze the meaning of words and phrases in their context. 1.B.3c. Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings). 1.B.3d Read age-appropriate material with fluency and accuracy. 1.B.4c Read age-appropriate material with fluency and accuracy. 1.B.5d Read age-appropriate material with fluency and accuracy. 10.C.4b Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology. 8.D Use algebraic concepts and procedures to represent and solve problems. 9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern. 11.B Know and apply the concepts, principles and processes of technological design.	
Objectives (What will students know and be able to do as a result of their learning?) <ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	Understand and demonstrate good safety practices Identify and locate the important parts of a CNC lathe Initialize the control software and verify the NC code on screen Load a piece of stock in the CNC lathe Manually control the CNC lathe to set the initial tool start position Machine a sample part with the CNC lathe Define and explain how the Cartesian coordinate system is used in our everyday lives List the importance of the Cartesian coordinate system Explain the difference between absolute and relative coordinate positioning Explain tool paths and show how they are used Describe the differences between rapid and cutting moves Describe the difference between rough and finish cuts Demonstrate the process of locating points along a tool path Generate an NC program on your own Troubleshoot an NC program to remove errors in the code Demonstrate the various processes involved with CNC manufacturing	

<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

Unit Frameworks

(One set for unit)

Unit of Study: major topics	Plastics Technology	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	1.A Apply word analysis and vocabulary skills to comprehend selections. 1.A.3b Analyze the meaning of words and phrases in their context. 1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings). 1.B.3d Read age-appropriate material with fluency and accuracy. 1.B.4c Read age-appropriate material with fluency and accuracy. 1.B.5d Read age-appropriate material with fluency and accuracy. 3.C Communicate ideas in writing to accomplish a variety of purposes. 4.A Listen effectively in formal and informal situations. 4.A.4a Apply listening skills as individuals and members of a group in a variety of settings (e.g., lectures, discussions, conversations, team projects, presentations, 4.A.4b Apply listening skills in practical settings (e.g., classroom note taking, interpersonal conflict situations, giving and receiving directions, evaluating persuasive 10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.	
Objectives (What will students know and be able to do as a result of their learning?)	Identify common plastic symbols Identify common abbreviations Describe common strengths and weaknesses of specific plastics Define Thermoplastic and thermosetting plastics Explain the history of plastics Demonstrate various methods of forming acrylic	

<ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	<p>Use proper safety rules to complete and activity</p> <p>Explain several steps involved in finishing acrylic</p> <p>Develop career awareness about the plastics industry</p> <p>Follow safety rules when using power equipment</p> <p>Identify basic machine parts</p> <p>Explain the function of each machine</p> <p>List common plastic adhesives</p> <p>Identify common plastic processes</p> <p>Operate an injection molder, vacuum former, and strip heater</p> <p>Develop creativity and problem solving skills</p> <p>Explain different coating processes</p> <p>Explain advantages and disadvantages of injection molding</p> <p>List common injection molded products</p> <p>Describe four classifications of adhesives</p> <p>List common compression molded products</p> <p>Explain two types of plastic adhesion</p> <p>Describe the plastic forming process</p> <p>Develop skills in staying on task and following directions</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All tests are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>

Unit Frameworks

(One set for unit)

Unit of Study: major topics	Residential Wiring	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	1.A Apply word analysis and vocabulary skills to comprehend selections. 1.A.3b Analyze the meaning of words and phrases in their context. 1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings). 1.B.3d Read age-appropriate material with fluency and accuracy. 1.B.4c Read age-appropriate material with fluency and accuracy. 1.B.5d Read age appropriate material with fluency and accuracy. 3.C Communicate ideas in writing to accomplish a variety of purposes. 6.D.3 Apply ratios and proportions to solve practical problems. 9.C.4b Construct and communicate convincing arguments for geometric situations. 9.C.4c Develop and communicate mathematical proofs (e.g., two-column, paragraph, indirect) and counter examples for geometric statements. 9.C.5a Perform and describe an original investigation of a geometric problem and verify the analysis and conclusions to an audience. 9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios. 9.D.5 Analyze and solve problems involving periodic patterns (e.g., sound waves, tide variations) using circular functions and communicate results orally and in writing.	
Objectives (What will students know and be able to do as a result of their learning?) <ul style="list-style-type: none"> ○ Conceptual ○ Factual ○ Procedural 	Describe the need for safety when working with electricity Identify and describe the basic tools used in residential wiring Discuss the different types of electric components Discuss the use of electric components Discuss wire size and uses Discuss the proper mounting of electrical components Demonstrate the proper wiring of electrical components Discuss the difference between 120V and 220V Demonstrate the proper wiring of low voltage components	

	Discuss careers associated with residential wiring	
Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	Other Evidence

Unit Frameworks

(One set for unit)

Unit of Study: major topics	CNC Mill	Resources that will support instruction
Illinois Learning Standards, Benchmarks, National Standards Assessment Frameworks, or other standards that will be taught in this unit	1.A Apply word analysis and vocabulary skills to comprehend selections. 1.A.3b Analyze the meaning of words and phrases in their context. 1.B.3c Continuously check and clarify for understanding (e.g., in addition to previous skills, draw comparisons to other readings). 1.B.3d Read age-appropriate material with fluency and accuracy. 1.B.4c Read age-appropriate material with fluency and accuracy. 1.B.5d Read age-appropriate material with fluency and accuracy. 3.C Communicate ideas in writing to accomplish a variety of purposes. 3.C.4b Using available technology, produce compositions and multimedia works for specified audiences. 3.C.5a Communicate information and ideas in narrative, informative and persuasive writing with clarity and effectiveness in a variety of written forms. 10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatter plots and box-plots. 9.C.4b Construct and communicate convincing arguments for geometric situations. 9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios. 11.B Know and apply the concepts, principles and processes of technological design.	
Objectives (What will students know and be able to do as a result of their learning?) ○ Conceptual	Understand and demonstrate good safety practices Identify and locate the important parts of a CNC mill Initialize the control software and verify the NC code on screen Load a piece of stock in the CNC mill Manually control the CNC mill to set the initial tool start position Machine a sample part with the CNC mill Explain how the Cartesian coordinate system is used in our everyday lives	

<ul style="list-style-type: none"> ○ Factual ○ Procedural 	<p>List the importance of the Cartesian coordinate system</p> <p>Explain the difference between absolute and relative coordinate positioning</p> <p>Explain tool paths and show how they are used</p> <p>Describe the differences between rapid and cutting moves</p> <p>Describe the difference between rough and finish cuts</p> <p>Demonstrate the process of locating points along a tool path</p> <p>Generate an NC program on your own</p> <p>Troubleshoot an NC program to remove errors in the code</p>	
<p>Assessments (What assessments, standardized, local, and/or performance-based will be used to measure learning and to drive instructional changes? How will we know whether or not they have learned? Can they demonstrate understanding and apply the essential skills?)</p>	<p>Performance Tasks</p> <p>Students will take a pre-test on the first day of the rotation to establish a baseline for the information covered in the unit. This is not a graded activity but should give students an idea of what the unit is about. Students begin using the activity guide to learn about the subject and to challenge daily response quizzes over the material in the activity guide and on the media pulse software. After completion of 9 activities the student will take a vocabulary test and a post test to complete the unit. All unit tests build a question bank for the final exam that is unique to each individual student in the class. All test are completed on the computer system and are graded immediately for feedback to the student. The student will always know his/her grade at anytime during the class.</p>	<p>Other Evidence</p>