

# Electrical, Electronic, and Communications Engineering Technology/Technician, Classification of Instructional Program (CIP) 15.0303

*Units of Instruction and Task Grid Linked to Pennsylvania Core Standards*

## 100 Safety

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>101</b> Demonstrate an understanding of state, school, and OSHA safety regulations.</p> <p><b>102</b> Practice safety techniques for electronics work.</p> <p><b>103</b> Demonstrate an understanding of proper fire drill procedures.</p> <p><b>104</b> Interpret Safety Data Sheets (SDS).</p> <p><b>105</b> RESERVED</p> <p><b>106</b> Explain the environmentally-safe disposal procedures for electronics equipment.</p> <p><b>107</b> Describe the physiological reaction to electrical shock causes.</p>	<p><b>CAREER CLUSTER</b> <b>Manufacturing Career Cluster</b> (Choose Standards) 1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b> <b>Maintenance, Installation and Repair Career Pathway</b> (Choose Standards) 1-2-3-4-5-6</p> <p><b>NOTE:</b> <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10. A</b> <b>Standard CC.3.5.11-12 A</b> Cite specific textual evidence, etc. <b>Standard CC.3.5.9-10 B</b> <b>Standard CC.3.5.11-12. B</b> Determine the central ideas or conclusions of a text; etc. <b>Standard CC.3.5.9-10.C</b> <b>Standard CC.3.5.11-12.C</b> Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10. D</b> <b>Standard CC.3.5.11-12.D</b> Determine the meaning of symbols, key terms, and other domain specific words. <b>Standard CC.3.5.9-10.E</b> <b>Standard CC.3.5.11-12.E</b> Analyze the structure of the relationships among concepts in a text, etc.</p>	<p><b>TEXT TYPES AND PURPOSE</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.6.9-10.A</b> <b>Standard CC.3.6.11-12.A</b> Write arguments focused on discipline specific content. <b>Standard CC.3.6.9-10.B</b> <b>Standard CC.3.6.11-12.B</b> Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.6.9-10.C</b> <b>Standard CC.3.6.11-12 C</b> Produce clear and coherent writing...appropriate to task, purpose, and audience. <b>Standard CC.3.6.9-10 D</b> <b>Standard CC.3.6.11-12.D</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most</p>	

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		<p><b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>  Analyze the author's purpose in providing an explanation, describing a procedure...and  Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>  Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p> <p><b>Standard CC.3.5.9-10. H</b>  Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b>  Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 11-12</b>  <b>Standard CC.3.5.11-12. G</b>  Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.  <b>Standard CC.3.5.11-12. H</b>  Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.  <b>Standard CC.3.5.11-12. I</b>  Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING</b>  <b>GRADES 9-10-11-12</b></p>	<p>significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>  Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>  Conduct short and more sustained research to answer a question or solve a problem.  <b>Standard CC.3.6.9-10.G.</b>  <b>Standard CC.3.6.11-12.G</b>  Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.  <b>Standard CC.3.6.9-10.H.</b>  <b>Standard CC.3.6.11-12.H.</b>  Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b>  Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

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		<b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11- 12, read and comprehend technical texts independently and proficiently.		

## 200 Electrical Quantities and Components

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>201</b> Recognize the basic units of Electronic Measurements.</p> <p><b>202</b> Recognize ISM system of measurement (International Systems of Measurements).</p> <p><b>203</b> Express numbers in scientific Engineering notation.</p> <p><b>204</b> Convert one power of ten to another power of ten.</p> <p><b>205</b> Use the resistor color code.</p> <p><b>206</b> Identify component symbols used in electronic schematic diagrams.</p> <p><b>207</b> Identify schematic symbols for various types of electrical and electronic components.</p> <p><b>208</b> Identify semiconductors and their usage.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>		<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p>

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## 300 Instrumentation

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>301</b> Demonstrate the use of a multi-meter, function generator, and frequency counter to measure voltage, resistance, and current.</p> <p><b>302</b> Make a circuit measurement to solve current requirements.</p> <p><b>303</b> Demonstrate the proper method of using an ohmmeter.</p> <p><b>304</b> Demonstrate the use of a power supply and adjust it to specified values.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p>

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# 400 Ohm's Law

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<p><b>401</b> Utilize Ohm's law to determine current, voltage, or resistance.</p> <p><b>402</b> Demonstrate an understanding of the meaning of and relationship between voltage, current, resistance, and power in DC using Ohm's Law Pie Chart.</p> <p><b>403</b> Demonstrate the linear relationship between current and voltage.</p> <p><b>404</b> Describes the relationship between voltage, current and power in an electric circuit using Watt's Law.</p> <p><b>405</b> Calculate nominal resistor using the resistor color code.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>



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## 500 Series Circuits

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>501</b> Demonstrate how voltages are distributed around a series circuit.</p> <p><b>502</b> Utilize double subscript notation.</p> <p><b>503</b> Demonstrate Kirchhoff's Voltage Law.</p> <p><b>504</b> Demonstrate voltage distribution and polarity of power supplies and resistors in a series circuit.</p> <p><b>505</b> Demonstrate calculations of power in a series circuit.</p> <p><b>506</b> Demonstrate troubleshooting open circuits and short circuits in a series circuit.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10. B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12. C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10. D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations/inequalities. and systems of equations/inequalities.</p>

## 600 Parallel Circuits

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>601</b> Calculate resistance in a parallel circuit.</p> <p><b>602</b> Demonstrate voltage in a parallel circuit.</p> <p><b>603</b> Demonstrate current flow in a parallel circuit.</p> <p><b>604</b> Apply Ohm's Law resistance for parallel circuit calculations.</p> <p><b>605</b> Calculate power in a parallel circuit.</p> <p><b>606</b> Troubleshoot open circuit and short circuit conditions in a parallel circuit.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 700 Series–Parallel Circuits

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>701</b> Determine the total resistance in a Series-Parallel Circuit.</p> <p><b>702</b> Apply Kirchhoff's current and voltage law to a Series-Parallel Circuit.</p> <p><b>703</b> Demonstrate a Series-Parallel circuit used as a voltage divider.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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## 800 Basic Network Theorem

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>801 Solve for the value of a load resistor. 802 Calculate voltage and current for various load resistors. 803 RESERVED 804 RESERVED 805 Calculate the value of load resistance for maximum power transfer. 806 RESERVED</p>	<p><b>CAREER CLUSTER</b> <b>Manufacturing Career Cluster</b> (Choose Standards) 1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b> <b>Maintenance, Installation and Repair Career Pathway</b> (Choose Standards) 1-2-3-4-5-6</p> <p><b>NOTE:</b> <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10. A</b> <b>Standard CC.3.5.11-12. A</b> Cite specific textual evidence, etc. <b>Standard CC.3.5.9-10. B</b> <b>Standard CC.3.5.11-12. B</b> Determine the central ideas or conclusions of a text; etc. <b>Standard CC.3.5.9-10.C</b> <b>Standard CC.3.5.11-12.C</b> Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10. D</b> <b>Standard CC.3.5.11-12.D</b> Determine the meaning of symbols, key terms, and other domain specific words. <b>Standard CC.3.5.9-10.E</b> <b>Standard CC.3.5.11-12.E</b> Analyze the structure of the relationships among concepts in a text, etc. <b>Standard CC.3.5.9-10.F</b> <b>Standard CC.3.5.11-12.F</b> Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b> <b>GRADES 9-10</b> <b>Standard CC.3.5.9-10.G</b> Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>		<p><b>NUMBERS AND OPERATIONS</b> <b>Standard 2.1.HS.F.2</b> Apply properties of rational and irrational numbers to solve real world or mathematical problems. <b>Standard 2.1.HS.F.4</b> Use units as a way to understand problems and to guide the solution of multistep problems. <b>Standard 2.1.HS.F.5</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. <b>Standard 2.1.HS.F.6</b> Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b> <b>Standard 2.2.HS.D.1</b> Interpret the structure of expressions to represent a quantity in terms of its context. <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems. <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials. <b>Standard 2.2.HS.D.4</b> Understand the relationship between zeros and factors of polynomials. <b>Standard 2.2.HS.D.5</b></p>



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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b></p> <p><b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b></p> <p><b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>		<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

# 900 Alternating Current

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>901</b> Calculate the frequency of the waveform.</p> <p><b>902</b> Determine the average and RMS values of a sine-wave.</p> <p><b>903</b> Explain various waveforms.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b>            Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b></p> <p><b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b></p> <p><b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b></p> <p><b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

# 1000 Oscilloscope

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1001</b> Describe the basic sections of an oscilloscope.</p> <p><b>1002</b> Measure voltage using an oscilloscope.</p> <p><b>1003</b> Measure frequency using an oscilloscope.</p> <p><b>1004</b> Measure phase relationships using an oscilloscope.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10. B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12. C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10. D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b>            Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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# 1100 Inductance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1101</b> Measure and calculate the effect of a series resistive-inductive (RL) circuit on DC voltage and current.</p> <p><b>1102</b> Measure and calculate the effect of a series resistive-inductive (RL) circuit on AC voltage and current.</p> <p><b>1103</b> Calculate the total inductance of inductors connected in series or parallel.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10. B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 1200 Inductive Reactance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1201</b> Measure and calculate the effect of inductive reactance on current.</p> <p><b>1202</b> Measure and calculate the effect of change in frequency on current.</p> <p><b>1203</b> Demonstrate the phase (lead-lag) relationship between current and applied voltage in a series RL circuit.</p> <p><b>1204</b> Calculate the total inductive reactance in series and parallel circuits.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>		<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>



Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
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# 1300 Resistor Inductor (RL) Circuits in Alternating Current (AC)

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1301</b> Demonstrate the use of vectors to describe magnitude and direction of voltages.</p> <p><b>1302</b> Demonstrate the use of vectors in determining total current or voltage in series and parallel RL circuits.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

# 1400 Transformers

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1401</b> Identify transformer windings and check for open and short circuits.</p> <p><b>1402</b> Calculate and measure voltage-turns ratio.</p> <p><b>1403</b> Measure the effect of secondary load on primary current.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b></p> <p><b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b></p> <p><b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b></p> <p><b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

# 1500 Capacitance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1501</b> Demonstrate the effect of capacitance in AC and DC circuits.</p> <p><b>1502</b> Calculate total capacitance in series and parallel circuits.</p> <p><b>1503</b> Calculate and measure RC time constants.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 1600 Capacitive Reactance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1601</b> Measure and calculate the effect of capacitive reactance on current.</p> <p><b>1602</b> Measure and calculate the effect of change in frequency on circuit current.</p> <p><b>1603</b> Demonstrate the phase (lead-lag) relationship between current and applied voltage in a series RC circuit.</p> <p><b>1604</b> Calculate the total capacitive reactance in series and parallel circuits.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>



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## 1700 Resistance Capacitance (RC) Circuits

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1701</b> Describe magnitude and direction of voltages using vectors.</p> <p><b>1702</b> Determining total current or voltage in series and parallel RC circuits using vectors.</p> <p><b>1703</b> Calculate Capacity/Rea -- (XC) in RC circuit.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems. <b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms. <b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships. <b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable. <b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method. <b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 1800 Resistance Inductance Capacitance (RLC) Circuits

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1801</b> Calculate total current in series RLC circuits.</p> <p><b>1802</b> Calculate total current in parallel RLC circuits.</p> <p><b>1803</b> Calculate true power, apparent power and power factor in a RLC circuit.</p> <p><b>1804</b> Calculate (XC) and (XL) for RLC circuit.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems. <b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms. <b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships. <b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable. <b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method. <b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

# 1900 Resonance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>1901</b> Calculate and measure the resonant frequency of a series RLC circuit.</p> <p><b>1902</b> Graph a response curve for a series resonant circuit, label Half-power points and bandwidth.</p> <p><b>1903</b> Calculate the "Q" of a series resonant circuit and demonstrate the effect it has on the response curve.</p> <p><b>1904</b> Calculate and measure the resonant frequency of a parallel RLC circuit.</p> <p><b>1905</b> Graph a response curve for a parallel resonant circuit, label half-power points and bandwidth.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10. B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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## 2000 Soldering

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2001</b> Demonstrate types and usage of a soldering iron.</p> <p><b>2002</b> Demonstrate the ability to de-solder components from the circuit board.</p> <p><b>2003</b> Demonstrate the ability to solder components to the circuit board.</p> <p><b>2004</b> Demonstrate the proper and safe method for soldering and de-soldering terminals and components.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	



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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

## 2100 Junction Diodes

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2101</b> Test a semiconductor diode and identify the cathode and anode leads using an ohmmeter.</p> <p><b>2102</b> Demonstrate the voltage-current relationship of a semiconductor diode by plotting the characteristic curve.</p> <p><b>2103</b> Demonstrate the correct bias for the operation of a LED.</p> <p><b>2104</b> Utilize a diode as a clipper or clamp.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 2200 Power Supplies

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2201</b> Identify common rectifier circuits (half-wave and full-wave).</p> <p><b>2202</b> Demonstrate the operation of a rectifier circuit.</p> <p><b>2203</b> Recognize various filter configurations and list their characteristics.</p> <p><b>2204</b> Calculate and measure DC output voltage for filtered and unfiltered power supplies.</p> <p><b>2205</b> Measure and calculate power supply ripple percentage and voltage regulation.</p> <p><b>2206</b> Calculate and measure the output voltage of a voltage multiplier.</p> <p><b>2207</b> Measure and plot the forward and reverse characteristics of a Zener diode.</p> <p><b>2208</b> Measure and demonstrate the regulation properties of a shunt type Zener regulator.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10. B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems. <b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms. <b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships. <b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable. <b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method. <b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 2300 Transistor Characteristics

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2301</b> Identify base, emitter, and collector terminals of PNP and NPN transistors.</p> <p><b>2302</b> Locate the ratings, characteristics and operating parameters listed on a typical transistor specification sheet.</p> <p><b>2303</b> Determine the type of transistor, NPN or PNP, and operating condition, using an ohmmeter.</p> <p><b>2304</b> Identify schematic symbols and uses for various types of transistors.</p> <p><b>2305</b> Identify differences between FET and BJT devices.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10. B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12. C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10. D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems. <b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms. <b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships. <b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable. <b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method. <b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 2400 Small Signal Amplifiers

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2401</b> Determine and demonstrate proper biasing polarity of NPN or PNP transistors in switching circuits.</p> <p><b>2402</b> Calculate decibel gain or loss.</p> <p><b>2403</b> Operate and measure the voltage gain of a common emitter audio amplifier.</p> <p><b>2404</b> Operate and measure the voltage gain of a common base amplifier.</p> <p><b>2405</b> Operate and measure the voltage gain of a common collector amplifier.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>



Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 2500 Operational Amplifiers

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2501</b> Operate and measure the phase shift between input and output of an inverting IC Op-Amp.</p> <p><b>2502</b> Operate and measure the phase shift between input and output of a non-inverting IC Op-Amp.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

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## 2600 Basic Digital Electronics

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2601</b> Convert decimal numbers to the binary number system and binary to decimal.</p> <p><b>2602</b> Convert binary numbers to hexadecimal number system and hexadecimal to binary.</p> <p><b>2603</b> Demonstrate the operation and the truth tables for the seven basic logic gates.</p> <p><b>2604</b> Connect and demonstrate combinational logic.</p> <p><b>2605</b> Describe Boolean reduction and Karnaugh mapping.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Use polynomial identities to solve problems.</p> <p><b>Standard 2.2.HS.D.6</b> Extend the knowledge of rational functions to rewrite in equivalent forms.</p> <p><b>Standard 2.2.HS.D.7</b> Create and graph equations or inequalities to describe numbers or relationships.</p> <p><b>Standard 2.2.HS.D.8</b> Apply inverse operations to solve equations or formulas for a given variable.</p> <p><b>Standard 2.2.HS.D.9</b> Use reasoning to solve equations and justify the solution method.</p> <p><b>Standard 2.2.HS.D.10</b> Represent, solve and interpret equations and inequalities and systems of equations/inequalities.</p>

## 2700 Nanotechnology

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>2701 Define nanotechnology. 2702 Explain nanotechnology measurements.</p>	<p><b>CAREER CLUSTER</b> <b>Manufacturing Career Cluster</b> (Choose Standards) 1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b> <b>Maintenance, Installation and Repair Career Pathway</b> (Choose Standards) 1-2-3-4-5-6</p> <p><b>NOTE:</b> <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10. A</b> <b>Standard CC.3.5.11-12. A</b> Cite specific textual evidence, etc. <b>Standard CC.3.5.9-10. B</b> <b>Standard CC.3.5.11-12. B</b> Determine the central ideas or conclusions of a text; etc. <b>Standard CC.3.5.9-10.C</b> <b>Standard CC.3.5.11-12.C</b> Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10. D</b> <b>Standard CC.3.5.11-12.D</b> Determine the meaning of symbols, key terms, and other domain specific words. <b>Standard CC.3.5.9-10.E</b> <b>Standard CC.3.5.11-12.E</b> Analyze the structure of the relationships among concepts in a text, etc. <b>Standard CC.3.5.9-10.F</b> <b>Standard CC.3.5.11-12.F</b> Analyze the author's purpose in providing an explanation, describing a procedure...and Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b> <b>GRADES 9-10</b> <b>Standard CC.3.5.9-10.G</b> Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.6.9-10.A</b> <b>Standard CC.3.6.11-12.A</b> Write arguments focused on discipline specific content. <b>Standard CC.3.6.9-10.B</b> <b>Standard CC.3.6.11-12.B</b> Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.6.9-10.C</b> <b>Standard CC.3.6.11-12. C</b> Produce clear and coherent writing...appropriate to task, purpose, and audience. <b>Standard CC.3.6.9-10. D</b> <b>Standard CC.3.6.11-12.D</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. <b>Standard CC.3.6.9-10.E</b> <b>Standard CC.3.6.11-12.E.</b> Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b> <b>GRADES 9-10-11-12</b> <b>Standard CC.3.6.9-10.F</b> <b>Standard CC.3.6.11-12.F</b> Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b> <b>Standard 2.1.HS.F.2</b> Apply properties of rational and irrational numbers to solve real world or mathematical problems. <b>Standard 2.1.HS.F.4</b> Use units as a way to understand problems and to guide the solution of multistep problems. <b>Standard 2.1.HS.F.5</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. <b>Standard 2.1.HS.F.6</b> Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b> <b>Standard 2.2.HS.D.1</b> Interpret the structure of expressions to represent a quantity in terms of its context. <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems. <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials. <b>Standard 2.2.HS.D.4</b> Understand the relationship between zeros and factors of polynomials. <b>Standard 2.2.HS.D.5</b></p>

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## 2800 Troubleshooting

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>2801</b> Solve simple problems using basic inquiry methods and strategies.</p> <p><b>2802</b> Demonstrate knowledge of troubleshooting procedures that are used for detecting failures in electrical and electronic circuits.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p><b>ALGEBRAIC CONCEPTS</b>  <b>Standard 2.2.HS.D.1</b>            Interpret the structure of expressions to represent a quantity in terms of its context.  <b>Standard 2.2.HS.D.2</b> Write expressions in equivalent forms to solve problems.  <b>Standard 2.2.HS.D.3</b> Extend the knowledge of arithmetic operations and apply to polynomials.  <b>Standard 2.2.HS.D.4</b>            Understand the relationship between zeros and factors of polynomials.  <b>Standard 2.2.HS.D.5</b></p>



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## 2900 Electronic Communications

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<p><b>2901</b> Identify and explain the major components of a basic communication system.</p> <p><b>2902</b> RESERVED</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	

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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author’s claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. <b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. <b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation. <b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

## 3000 Motors

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>3001</b> Describe the characteristics of AC and DC motors.</p> <p><b>3002</b> Describe characteristics of induction and Stepper motors.</p> <p><b>3003</b> Explain the difference between brushed and brushless motors.</p> <p><b>3004</b> Explain the use and function of a servomechanism to control the performance of a device.</p> <p><b>3005</b> Demonstrate knowledge of motor controllers and speed controllers.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12. A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	<p><b>NUMBERS AND OPERATIONS</b>  <b>Standard 2.1.HS.F.2</b>            Apply properties of rational and irrational numbers to solve real world or mathematical problems.  <b>Standard 2.1.HS.F.4</b>            Use units as a way to understand problems and to guide the solution of multistep problems.  <b>Standard 2.1.HS.F.5</b>            Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  <b>Standard 2.1.HS.F.6</b>            Extend the knowledge of arithmetic operations and apply to complex numbers.</p>

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		<p><b>Standard CC.3.5.9-10. H</b> Assess the reasoning in a text to support the author's claim for solving a technical problem.</p> <p><b>Standard CC.3.5.9-10. I</b> Compare and contrast findings presented in a text to those from other sources, etc.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS GRADES 11-12</b> <b>Standard CC.3.5.11-12. G</b> Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem.</p> <p><b>Standard CC.3.5.11-12. H</b> Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible.</p> <p><b>Standard CC.3.5.11-12. I</b> Synthesize information from a range of sources into a coherent understanding.</p> <p><b>RANGE OF READING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.J Standard CC.3.5.11-12.J</b> By the end of grades 9- 10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p><b>Standard CC.3.6.9-10.G.</b> <b>Standard CC.3.6.11-12.G</b> Gather relevant information from multiple authoritative print and digital sources, following a standard format for citation.</p> <p><b>Standard CC.3.6.9-10.H.</b> <b>Standard CC.3.6.11-12.H.</b> Draw evidence from informational texts to support analysis, reflection, and research.</p> <p><b>RANGE OF WRITING GRADES 9-10-11-12</b> <b>Standard CC.3.5.9-10.I &amp; Standard CC.3.5.11-12.I.</b> Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

## 3100 History of Electronics

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p><b>3101</b> Describe the history of electricity.</p> <p><b>3102</b> Describe the history of the vacuum tube and transistor.</p> <p><b>3103</b> Describe the history of the integrated circuit.</p>	<p><b>CAREER CLUSTER</b>  <b>Manufacturing Career Cluster</b>            (Choose Standards)            1-2-3-4-5-6-7</p> <p><b>CAREER PATHWAYS INCLUDE:</b>  <b>Maintenance, Installation and Repair Career Pathway</b>            (Choose Standards)            1-2-3-4-5-6</p> <p><b>NOTE:</b>  <b>Refer to the Common Career Technical Core Standards Booklet if you wish to add more Pathways to meet the needs of your local Area.</b></p>	<p><b>KEY IDEAS/DETAILS</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. A</b>  <b>Standard CC.3.5.11-12 A</b>            Cite specific textual evidence, etc.  <b>Standard CC.3.5.9-10 B</b>  <b>Standard CC.3.5.11-12. B</b>            Determine the central ideas or conclusions of a text; etc.  <b>Standard CC.3.5.9-10.C</b>  <b>Standard CC.3.5.11-12.C</b>            Follow precisely a complex multistep procedure, etc.</p> <p><b>CRAFT &amp; STRUCTURE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.5.9-10. D</b>  <b>Standard CC.3.5.11-12.D</b>            Determine the meaning of symbols, key terms, and other domain specific words.  <b>Standard CC.3.5.9-10.E</b>  <b>Standard CC.3.5.11-12.E</b>            Analyze the structure of the relationships among concepts in a text, etc.  <b>Standard CC.3.5.9-10.F</b>  <b>Standard CC.3.5.11-12.F</b>            Analyze the author's purpose in providing an explanation, describing a procedure...and            Analyze the structure of the relationships among concepts in a text.</p> <p><b>INTEGRATE KNOWLEDGE &amp; IDEAS</b>  <b>GRADES 9-10</b>  <b>Standard CC.3.5.9-10.G</b>            Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart).</p>	<p><b>TEXT TYPES AND PURPOSE</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.A</b>  <b>Standard CC.3.6.11-12.A</b>            Write arguments focused on discipline specific content.  <b>Standard CC.3.6.9-10.B</b>  <b>Standard CC.3.6.11-12.B</b>            Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p><b>PRODUCTION &amp; DISTRIBUTION OF WRITING</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.C</b>  <b>Standard CC.3.6.11-12 C</b>            Produce clear and coherent writing...appropriate to task, purpose, and audience.  <b>Standard CC.3.6.9-10 D</b>  <b>Standard CC.3.6.11-12.D</b>            Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  <b>Standard CC.3.6.9-10.E</b>  <b>Standard CC.3.6.11-12.E.</b>            Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p><b>RESEARCH</b>  <b>GRADES 9-10-11-12</b>  <b>Standard CC.3.6.9-10.F</b>  <b>Standard CC.3.6.11-12.F</b>            Conduct short and more sustained research to answer a question or solve a problem.</p>	

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