



Engineering Technology/Technicians, Classification of Instructional Program (CIP) 15.9999

Units of Instruction and Task Grid Linked to Pennsylvania Core Standards

100 ENGINEERING 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>101 Implement a safety plan.</p> <p>102 Operate lab equipment according to safety guidelines.</p> <p>103 Use appropriate personal protective equipment.</p> <p>104 Comply with OSHA and EPA regulations for a safe work site.</p> <p>105 Identify emergency first aid procedures.</p> <p>106 Maintain safe working practices around tools and equipment.</p> <p>107 Participate in classroom and laboratory management and cleanup activities.</p> <p>108 Demonstrate a professional attitude toward classroom and laboratory activities.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: 1 - 3 - 4 - 6</p>	<p style="text-align: center;">KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p style="text-align: center;">CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p style="text-align: center;">INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H</p> <p>Standard PCS.3.5.9-10.I</p>	<p style="text-align: center;">TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p style="text-align: center;">PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p style="text-align: center;">RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p style="text-align: center;">GRADES 11-12 Standard PCS.3.6.11-12.F</p>	<p style="text-align: center;">NUMBERS AND OPERATIONS</p> <p>Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</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>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard CC.3.5.11-12.I</p>	

200 KNOWLEDGE OF ENGINEERING

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>201 Demonstrate knowledge of the history of engineering.</p> <p>202 Investigate engineering careers, training and associated opportunities.</p> <p>203 Explain the purpose and functions of an engineering team.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST5 - STSM4</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D. Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	

300 ETHICS IN ENGINEERING

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>301 Analyze current professional engineering codes of ethics.</p> <p>302 Analyze ethical engineering issues.</p> <p>303 Analyze and explain ethical and technical issues contributing to an engineering disaster.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: STET4 - STSM4</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	

400 PROBLEM SOLVING IN ENGINEERING

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>401 Identify the engineering problem.</p> <p>402 Gather information about problems and solutions.</p> <p>403 Identify information resources.</p> <p>404 Apply steps in the problem solving method.</p> <p>405 Identify the way numbers are expressed in scientific notation, engineering notation, and System International (SI) notation.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: 1 - 2 - ST1 - ST2 - ST3 - ST6 - STSM1 STSM 2 - STSM 3</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10.D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.C Standard PCS.3.6.11-12.D Standard PCS.3.6.11-12.E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>OPERATIONS AND ALGEBRAIC THINKING Functions Standard PCS.2.2.HS.C.1 Standard PCS.2.2.HS.C.2 Standard PCS.2.2.HS.C.3 Standard PCS.2.2.HS.C.4 Standard PCS.2.2.HS.C.5 Standard PCS.2.2.HS.C.6 Standard PCS.2.2.HS.C.7 Standard PCS.2.2.HS.C.8 Standard PCS.2.2.HS.C.9</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7</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
		Standard PCS.3.5.11-12.J		Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11 Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14 MEASUREMENT, DATA AND PROBABILITY Standard PCS.2.4.HS.B.1 Standard PCS.2.4.HS.B.2 Standard PCS.2.4.HS.B.3 Standard PCS.2.4.HS.B.4 Standard PCS.2.4.HS.B.5 Standard PCS.2.4.HS.B.6 Standard PCS.2.4.HS.B.7

500 TEAMWORK

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>501</p> <p>502</p> <p>503</p> <p>504</p> <p>505 Actively participate as a member of an engineering project team.</p> <p>506 Apply constructive feedback.</p> <p>507 Resolve conflict within the team. Demonstrate active listening techniques.</p> <p>508 Demonstrate formal and informal speaking skills.</p> <p>509 Explain the importance of selling a project idea to team members. Identify ways to motivate, coach, counsel, and reward individuals and teams. Perform a team peer review. Perform evaluations (e.g. self-evaluation and management evaluation).</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST6</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10.D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.C Standard PCS.3.6.11-12.D Standard PCS.3.6.11-12.E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	

600 ENGINEERING GRAPHICS

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>601 Proper use of graphics equipment and tools.</p> <p>602 Describe various types of drawings.</p> <p>603 Perform metric-U.S. system conversions.</p> <p>604 Use engineer's and architect's scales.</p> <p>605 Prepare freehand sketches.</p> <p>606 Apply line conventions.</p> <p>607 Prepare orthographic projection drawings.</p> <p>608 Prepare additional views to clarify the design.</p> <p>609 Apply principles of dimensioning and annotation.</p> <p>610 Prepare drawings for product assembly, fabrication, or construction.</p> <p>611 Create schematics.</p> <p>612 Revise an existing drawing to meet modifications or changes.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST6</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.A</p> <p>Standard PCS.3.5.9-10.B</p> <p>Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12</p> <p>Standard PCS.3.5.11-12A</p> <p>Standard PCS.3.5.11-12.B</p> <p>Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.D</p> <p>Standard PCS.3.5.9-10.E</p> <p>Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12</p> <p>Standard PCS.3.5.11-12.D</p> <p>Standard PCS.3.5.11-12.E</p> <p>Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.G</p> <p>Standard PCS.3.5.9-10.H</p> <p>Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12</p> <p>Standard PCS.3.5.11-12.G</p> <p>Standard PCS.3.5.11-12.H</p> <p>Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12</p> <p>Standard PCS.3.5.11-12.J</p>		<p>NUMBERS AND OPERATIONS</p> <p>Standard PCS.2.1.HS.F.1</p> <p>Standard PCS.2.1.HS.F.2</p> <p>Standard PCS.2.1.HS.F.3</p> <p>Standard PCS.2.1.HS.F.4</p> <p>Standard PCS.2.1.HS.F.5</p> <p>Standard PCS.2.1.HS.F.6</p> <p>Standard PCS.2.1.HS.F.7</p>

700 ENGINEERING DESIGN PROCESSES

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>701 Identify the steps of an "iterative" design process.</p> <p>702 Create an engineering solution for a real world problem.</p> <p>703 Determine whether design is safe for a given user.</p> <p>704 Generate a design improvement to address specific flaws/failures.</p> <p>705 Create a proposal for an engineering project.</p> <p>706 Participate in a design review.</p> <p>707 Prepare a schedule for a design project.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET6</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</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
		Standard PCS.3.5.11-12.J		

800 MODELING

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 Identify the three areas of modeling (i.e. physical, conceptual, and mathematical).</p> <p>802 Create a scale model or working prototype.</p> <p>803 Evaluate a scale model or a working prototype.</p> <p>804 Identify methods and sources for obtaining materials and supplies.</p> <p>805 Compile a materials list that includes vendors and costs for all required materials and equipment to build the prototype.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST2 - ST6 -STET1 - STET3 - STET5 - STET6 -- STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING</p> <p>Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>OPERATIONS AND ALGEBRAIC THINKING</p> <p>Functions Standard PCS.2.2.HS.C.1 Standard PCS.2.2.HS.C.2 Standard PCS.2.2.HS.C.3 Standard PCS.2.2.HS.C.4 Standard PCS.2.2.HS.C.5 Standard PCS.2.2.HS.C.6 Standard PCS.2.2.HS.C.7 Standard PCS.2.2.HS.C.8 Standard PCS.2.2.HS.C.9</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7 Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11</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
				Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14

900 KNOWLEDGE OF MANUFACTURING AND INDUSTRIAL SYSTEMS

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>901 Research the history of manufacturing and its milestones.</p> <p>902 Research a topic in manufacturing.</p> <p>903 Describe procedures used in manufacturing.</p> <p>904 Identify basic flowcharting and discuss their functions.</p> <p>905 Create and apply a flowchart that portrays a manufacturing process.</p> <p>906 Create a control system that replicates a factory cell.</p> <p>907 Apply manufacturing systems to develop and produce a prototype for a product.</p> <p>908 Evaluate a product prototype and the processes used in its manufacture.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - STET6</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	

1000 MANUFACTURING PROCESSES

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>1001 Demonstrate how research is used in engineering economics.</p> <p>1002 Demonstrate the relationship of time and cost to manufacturing systems.</p> <p>1003 Explain the difference between primary and secondary manufacturing processes.</p> <p>1004 Evaluate and present a production line activity.</p> <p>1005 Outline the product-development process.</p> <p>1006 Plan steps of production for a manufactured product.</p> <p>1007 List tools needed for a manufactured product.</p> <p>1008 Make a list of the production processes in manufacturing.</p> <p>1009 Apply manufacturing systems to develop and produce a prototype for a product.</p> <p>1010 Evaluate a product prototype and the processes used in its manufacture.</p> <p>1011 Write a step by step procedure for an assembly.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - STET6</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p>

1100 COMPUTER ASSISTED MANUFACTURING (CAM)

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>1101 Prepare a process, identify machines that will be used to carry out the process, and then describe the work that each machine performs.</p> <p>1102 Research the history and industrial use of CAM.</p> <p>1103 Demonstrate how to use CAM software to create a program for a machine part.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET6</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10.D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.C Standard PCS.3.6.11-12.D Standard PCS.3.6.11-12.E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7 Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11 Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14</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
		GRADES 11-12 Standard PCS.3.5.11-12.J		

1200 POWER AND ENERGY

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>1201 Define "What is Power?"</p> <p>1202 Discuss the forms of potential energy.</p> <p>1203 Design a vehicle that stores and releases potential energy for propulsion.</p> <p>1204 Discuss the forms of kinetic energy.</p> <p>1205 Research methods of energy conversion (e.g. electrical, fluid, mechanical).</p> <p>1206 Define terms used in power systems.</p> <p>1207 Name the laws of thermodynamics.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - STET1 - STET3</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p>

1300 MECHANICAL ADVANTAGE AND MECHANISMS

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>1301 Locate and explain examples of the six simple machines, their attributes and components.</p> <p>1302 Measure forces and distances related to mechanisms.</p> <p>1303 Calculate mechanical advantage and drive ratios of mechanisms.</p> <p>1304 Design, create, and test various drive systems.</p> <p>1305 Determine efficiency in a mechanical system.</p> <p>1306 Convert power between units.</p> <p>1307 Measure torque, and use it to calculate power.</p> <p>1308 Demonstrate principles of mechanical systems as they relate to power transmission.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7 Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11 Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14</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
		Standard PCS.3.5.11-12.J		

1400 FLUID POWER SYSTEMS

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>1401 Design, create, and test a fluid power system.</p> <p>1402 Identify components of a fluid system.</p> <p>1403 Calculate values in a fluid power system, using Pascal's Law.</p> <p>1404 Calculate values in a pneumatic system, using the ideal gas laws.</p> <p>1405 Calculate flow rate, flow velocity, and mechanical advantage in a fluid power system.</p> <p>1406 Maintain a fluid power system.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7 Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11 Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14</p>

1500 GREEN ENERGY

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>1501 Produce mechanical power, using alternative energy systems.</p> <p>1502 Research renewable/non renewable energy sources.</p> <p>1503 Study energy efficiency and conservation.</p> <p>1504 Create a model that will utilize a renewable energy concept.</p> <p>1505 Investigate biodegradable materials for an alternative energy source.</p> <p>1506 Prepare a concept of an alternative energy for transportation.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p>

1600 MACHINE CONTROLS AND AUTOMATED SYSTEMS

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>1601 Choose appropriate machine control inputs and outputs, based on the need of a technological system.</p> <p>1602 Design and create a control system, based on given needs and constraints.</p> <p>1603 Differentiate between the characteristics of digital and analog devices.</p> <p>1604 Select between open and closed loop systems to solve a technological problem.</p> <p>1605 Create system control programs using flowchart logic.</p> <p>1606 Define and discuss open and closed loop systems.</p> <p>1607 Create and use flowcharts.</p> <p>1608 Identify components needed to integrate computer controls for an automated system.</p> <p>1609 Plan, design, and construct an automated system.</p> <p>1610 Program an automated system using computer hardware and software.</p> <p>1611 Interface system output to another automated system.</p> <p>1612 Create and program a simulated work cell with simulation software.</p> <p>1613 Demonstrate the ability to program timers, counters and loops.</p> <p>1614 Identify and explain various types of electrical motors.</p> <p>1615 Interface output devices to a computer, microcontroller or programmable logic controller.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3. Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p>

1700 PROPERTIES OF MATERIALS

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>1701 Describe the properties of materials.</p> <p>1702 Investigate methods used to alter materials.</p> <p>1703 Illustrate causes of failure in materials.</p> <p>1704 Calculate material properties relating to a stress strain curve.</p> <p>1705 Create a written report of material test evaluations.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p>

1800 NATURAL, COMPOSITE AND SYNTHETIC MATERIALS

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>1801 Investigate various types of metals and application.</p> <p>1802 Investigate various types of manufacturing wood and applications.</p> <p>1803 Investigate various types of ceramics and applications.</p> <p>1804 Investigate various composite and synthetic materials.</p> <p>1805 Solve a problem, design a product, or a prototype, that requires natural, composites and/or synthetic materials.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12</p> <p>Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12</p> <p>Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12</p> <p>Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10</p> <p>Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12</p> <p>Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10</p> <p>Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12</p> <p>Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10</p> <p>Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12</p> <p>Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10</p> <p>Standard PCS.3.5.9-10.I</p>	<p>OPERATIONS WITH REAL</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
		Standard PCS.3.5.9-10.J GRADES 11-12 Standard PCS.3.5.11-12.J	GRADES 11-12 Standard PCS.3.5.11-12.I	

1900 STRENGTH OF MATERIALS

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>1901 Demonstrate knowledge of the principles of statics and dynamics to calculate the strength of various engineering materials used to build a structure.</p> <p>1902 Create free body diagrams of objects, identifying all forces acting on the object.</p> <p>1903 Locate the centroid of a rectangle and a triangle, using mathematics.</p> <p>1904 Calculate the moment of inertia for a rectangular shape.</p> <p>1905 Differentiate between scalar and vector quantities.</p> <p>1906 Identify magnitude, direction, and sense of a vector.</p> <p>1907 Calculate the X and Y components, given a vector.</p> <p>1908 Calculate moment forces, given a specified axis.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3. Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7 Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11 Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14</p>

2000 KINEMATICS

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>2001 Given a set of data, calculate distance, displacement, speed, velocity, and acceleration.</p> <p>2002 Calculate acceleration due to gravity, based on data from a free fall device.</p> <p>2003 Calculate the X and Y components of a projectile motion.</p> <p>2004 Determine the needed angle to launch a projectile a specific range, given the projectile's initial velocity.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>		<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING</p> <p>Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>OPERATIONS AND ALGEBRAIC THINKING</p> <p>Functions Standard PCS.2.2.HS.C.1 Standard PCS.2.2.HS.C.2 Standard PCS.2.2.HS.C.3 Standard PCS.2.2.HS.C.4 Standard PCS.2.2.HS.C.5 Standard PCS.2.2.HS.C.6 Standard PCS.2.2.HS.C.7 Standard PCS.2.2.HS.C.8 Standard PCS.2.2.HS.C.9</p> <p>GEOMETRY Standard PCS.2.3.HS.A.1 Standard PCS.2.3.HS.A.2 Standard PCS.2.3.HS.A.3 Standard PCS.2.3.HS.A.4 Standard PCS.2.3.HS.A.5 Standard PCS.2.3.HS.A.6 Standard PCS.2.3.HS.A.7 Standard PCS.2.3.HS.A.8 Standard PCS.2.3.HS.A.9 Standard PCS.2.3.HS.A.10 Standard PCS.2.3.HS.A.11</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
				Standard PCS.2.3.HS.A.12 Standard PCS.2.3.HS.A.13 Standard PCS.2.3.HS.A.14 MEASUREMENT, DATA AND PROBABILITY Standard PCS.2.4.HS.B.1 Standard PCS.2.4.HS.B.2 Standard PCS.2.4.HS.B.3 Standard PCS.2.4.HS.B.4 Standard PCS.2.4.HS.B.5 Standard PCS.2.4.HS.B.6 Standard PCS.2.4.HS.B.7

2100 TOTAL QUALITY CONTROL

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>2101 Explain the eight "M" words as they relate to total quality control in the manufacturing industry: Machines, Methods, Materials, Manpower, Measurement, Milieu, Management, and Maintenance.</p> <p>2102 Demonstrate knowledge of ISO quality standards.</p> <p>2103 Demonstrate the application of the following total quality management techniques: cause and effect diagram, check sheet, control chart, histogram, Pareto chart, scatter diagram, and flow chart.</p> <p>2104 Create a total quality control checklist for a product.</p> <p>2105 Communicate total quality control expectations to user groups.</p> <p>2106 Identify how to correct, and improve, a finding from an inspection document.</p> <p>2107 Develop a report of total quality control inspection observations and findings.</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p>

2200 PRECISION MEASUREMENT FOR INDUSTRY

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>2201 Convert numbers between the hexadecimal or octal number systems and the decimal number system.</p> <p>2202 Make linear measurements accurately to 1/16".</p> <p>2203 Use a micrometer to measure accurately to .001".</p> <p>2204 Use a dial caliper to measure accurately to .001".</p> <p>2205 Use combination squares and protractors for angular measurement.</p> <p>2206 Use a height gauge to layout and measure part to measure accurately to .001".</p> <p>2207 Use inside micrometers and telescoping gauges to measure accurately to .001".</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p>

2300 BASIC ELECTRICITY AND 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>2301 Identify and demonstrate safety rules in the use of electrical lab machines and equipment.</p> <p>2302 Define and describe basic terms in electricity and electronics.</p> <p>2303 Identify electrical and electronic symbols on a schematic.</p> <p>2304 Follow a schematic and construct series and parallel electrical and electronic circuits.</p> <p>2305 Identify resistors by type and value.</p> <p>2306 Describe various types of sensing and control devices.</p> <p>2307 Use a digital multi-meter to measure circuit values of current, resistance, and voltage.</p> <p>2308 Compute values of current, resistance and voltage using Ohm's Law.</p> <p>2309 Compare DC and AC waveforms, using an oscilloscope.</p> <p>2310 Analyze and measure values in AC circuits (including inductance, capacitance, reactance, and LRC circuits).</p> <p>2311 Calculate voltage, amperage, resistance, and power in all types of circuits.</p> <p>2312 Troubleshoot all types of circuits.</p> <p>2313 Identify functions, operation, and characteristics of grounding systems.</p> <p>2314 Interpret the NEC requirements for electrical installations.</p> <p>2315 Demonstrate lockout/tag out procedures.</p> <p>2316 Identify and install electrical panel boards and switchboards.</p> <p>2317 Identify, select, and install overcurrent devices.</p> <p>2318 Identify/install various ground fault circuit interrupter (GFCI) and arc fault devices.</p> <p>2319 Explain transformer operation.</p> <p>2320 Describe and identify types of oscillators.</p> <p>2321 Identify and describe semiconductor atomic structure and construction methods.</p> <p>2322 Construct an amplifier circuit and</p>	<p>Refer to the end of this document for an explanation of the following standards and sample indicators:</p> <p>STANDARDS: ST1 - ST2 - ST6 - STET1 - STET 2 - STET3 - STET6 - STSM1 - STSM2</p>	<p>KEY IDEAS/DETAILS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.A Standard PCS.3.5.9-10.B Standard PCS.3.5.9-10.C</p> <p>GRADES 11-12 Standard PCS.3.5.11-12A Standard PCS.3.5.11-12.B Standard PCS.3.5.11-12.C</p> <p>CRAFT AND STRUCTURE</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.D Standard PCS.3.5.9-10.E Standard PCS.3.5.9-10.F</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.D Standard PCS.3.5.11-12.E Standard PCS.3.5.11-12.F</p> <p>INTEGRATE KNOWLEDGE/ IDEAS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.G Standard PCS.3.5.9-10.H Standard PCS.3.5.9-10.I</p> <p>GRADES 9-12 Standard PCS.3.5.11-12.G Standard PCS.3.5.11-12.H Standard PCS.3.5.11-12.I</p> <p>RANGE OF READING/LEVEL OF COMPLEX TEXTS</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.J</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.J</p>	<p>TEXT TYPES/ PURPOSE</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.A Standard PCS.3.6.9-10.B</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.A Standard PCS.3.6.11-12.B</p> <p>PRODUCTION AND DISTRIBUTION OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.C Standard PCS.3.6.9-10 D Standard PCS.3.6.9-10.E</p> <p>GRADES 11-12 Standard PCS.3.6.11-12 C Standard.PCS.3.6.11-12.D Standard PCS.3.6.11- 12 E</p> <p>RESEARCH</p> <p>GRADES 9-10 Standard PCS.3.6.9-10.F Standard PCS.3.6.9-10.G Standard PCS.3.6.9-10.H</p> <p>GRADES 11-12 Standard PCS.3.6.11-12.F Standard PCS.3.6.11-12.G Standard PCS.3.6.11-12.H</p> <p>RANGE OF WRITING</p> <p>GRADES 9-10 Standard PCS.3.5.9-10.I</p> <p>GRADES 11-12 Standard PCS.3.5.11-12.I</p>	<p>NUMBERS AND OPERATIONS Standard PCS.2.1.HS.F.1 Standard PCS.2.1.HS.F.2 Standard PCS.2.1.HS.F.3 Standard PCS.2.1.HS.F.4 Standard PCS.2.1.HS.F.5 Standard PCS.2.1.HS.F.6 Standard PCS.2.1.HS.F.7</p> <p>OPERATIONS AND ALGEBRAIC THINKING Algebra Standard PCS.2.2.HS.D.1 Standard PCS.2.2.HS.D.2 Standard PCS.2.2.HS.D.3 Standard PCS.2.2.HS.D.4 Standard PCS.2.2.HS.D.5 Standard PCS.2.2.HS.D.6 Standard PCS.2.2.HS.D.7 Standard PCS.2.2.HS.D.8 Standard PCS.2.2.HS.D.9 Standard PCS.2.2.HS.D.10</p> <p>OPERATIONS AND ALGEBRAIC THINKING Functions Standard PCS.2.2.HS.C.1 Standard PCS.2.2.HS.C.2 Standard PCS.2.2.HS.C.3 Standard PCS.2.2.HS.C.4 Standard PCS.2.2.HS.C.5 Standard PCS.2.2.HS.C.6 Standard PCS2.2.HS.C.7 Standard PCS.2.2.HS.C.8 Standard PCS.2.2.HS.C.9</p> <p>MEASUREMENT, DATA AND PROBABILITY Standard PCS.2.4.HS.B.1 Standard PCS.2.4.HS.B.2 Standard PCS.2.4.HS.B.3 Standard PCS.2.4.HS.B.4 Standard PCS.2.4.HS.B.5 Standard PCS.2.4.HS.B.6 Standard PCS.2.4.HS.B.7</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>2323 verify the characteristics. Construct a power supply circuit and verify operation.</p> <p>2324 Use circuit simulation software to construct and analyze digital and microprocessor circuit characteristics.</p> <p>2325 Identify and explain various types of motors, e.g. induction, etc., and the principles of their operation.</p>				

Reference List for 12 Common Core Technical Standards for Engineering, Technology/Technician with Sample Indicators for each Standard

Standard 1: Apply engineering skills in a project that requires project management, process control and quality assurance.

1 a. No Sample Indicators.

Standard 2: Use technology to acquire, manipulate, analyze and report data.

- 2 a. Use statistical tools to analyze data.
- 2 b. Query and extract information from data.
- 2 c. Create knowledge from data.
- 2 d. Apply techniques for modeling systems or problems.
- 2 e. Apply techniques for scientific visualization and animation of complex physical systems or problems.
- 2 f. Test different scenarios to multiple variables.
- 2 g. Write a computer program, e.g. Java, C++.
- 2 h. Execute a computer program, e.g. Java, C++.
- 2 i. Using a selected statistical tool, compute data reliability.
- 2 j. Select and use the tools to analyze and synthesize data.
- 2 k. Describe the meaning of probability and how it applies to a set of data.
- 2 l. Select the proper visualization tools.
- 2 m. Use simulation, modeling and prototype techniques to solve problems.
- 2 n. Communicate data visually.

Standard 3: Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.

- 3 a. Exercise good safety practices.
- 3 b. Follow various regulatory codes, such as EPA, FEMA, UL, OSHA, CSA.
- 3 c. Reference and use material safety data sheets (MSDS).
- 3 d. Encourage others to employ safe practices.
- 3 e. Demonstrate safe use of tools and equipment.
- 3 f. Develop and implement emergency plans.
- 3 g. Develop and implement workplace lab safety plan.
- 3 h. Follow workplace regulations and record keeping requirements.
- 3 i. Demonstrate the use of safety equipment in the workplace.
- 3 j. Demonstrate the use of eyewash and safety showers.
- 3 k. Accurately interpret safety signs, symbols and labels.
- 3 l. Demonstrate basic first aid techniques.
- 3 m. Discuss physical, chemical, toxicological, biological and radioactive hazards.

- 3 n. Analyze environmental impacts.
- 3 o. Conduct a safety audit.

Standard 4: Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

- 4 a. No Sample Indicators.

Standard 5: Demonstrate an understanding of the breadth of career opportunities and means to those opportunities in each of the Science, Technology, Engineering and Mathematics Career Pathways.

- 5 a. Locate and interpret career information for at least one career pathway within the cluster.
- 5 b. Identify job requirements for the career cluster/pathway.
- 5 c. Identify educational and credentialing requirements for careers within the cluster.
- 5 d. Identify personal interests and aptitudes.
- 5 e. Identify job requirements and characteristics for selected careers.
- 5 f. Compare personal interests and aptitudes with job requirements and characteristics of the career selected.
- 5 g. Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.
- 5 h. List resources for researching funding sources for scientific projects and technology.
- 5 i. List careers that you have investigated, internships that you could apply for and job shadowing opportunities that you have identified.
- 5 j. Construct and maintain a portfolio of experiences and accomplishments.

Standard 6: Demonstrate technical skills needed in a chosen STEM field.

- 6 a. No Sample Indicators.

STANDARDS FOR STEM CONCEPTS (STET)

Standard STET 1: Use STEM concepts and processes to solve problems involving design and/or production.

- STET 1 a. No Sample Indicators.

Standard STET 2: Display and communicate STEM information.

- STET 2 a. No Sample Indicators.

Standard STET 3: Apply processes and concepts for the use of technological tools in STEM.

- STET 3 a. No Sample Indicators.

Standard STET 4: Apply the knowledge learned in the study of STEM to provide solutions to human and societal problems in an ethical and legal manner.

- STET 4 a. No Sample Indicators.

Standard STET 5: Apply the elements of the design process.

- STET 5 a. Exhibit an understanding of customer needs in the design process.

Standard STET 6: Apply the knowledge learned in STEM to solve problems.

- STET 6 a. Evaluate mathematical solutions for reasonableness.
- STET 6 b. Using appropriate data collection and statistical analysis methods, display the data as a means to make a decision.
- STET 6 c. Identify, analyze and solve defined engineering technology problems.

- STET 6 d. Conduct, analyze and interpret experiments.
- STET 6 e. Conduct standard tests and measurements.
- STET 6 f. Apply scalar and vector quantities as applied to physical systems, such as the relationship between position, velocity and acceleration.
- STET 6 g. Describe the relationships between amplitude, wavelength, frequency, period and speed of a wave.
- STET 6 h. Use the laws of conservation of energy, charge and momentum to solve a variety of problems involving mechanical, fluid, chemical, biological, electrical and thermal systems.
- STET 6 i. Show how the relationships between energy, work and power can be used to solve a variety of problems involving mechanical, fluid, electrical and thermal systems.
- STET 6 j. Apply the principles of ray optics to describe reflection and refraction of light.

STANDARDS FOR SCIENCE AND MATHEMATICS (STSM)

- STSM 1: Apply science and mathematics to provide results, answers and algorithms for engineering and technological activities.
- STSM 2: Discuss the importance of modeling to science and technology.
- STSM 3: Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.
- STSM 4: Analyze the impact that science and mathematics has on society.
- STSM 5: Apply critical thinking skills to review information, explain statistical analysis and to translate, interpret and summarize research and statistical data.