Manufacturing Career Pathways for the Lehigh Valley

Education Joining Workforce Development

Lehigh Valley Workforce Investment Board, Inc.
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Introduction

The US Department of Labor Career Pathways Initiative has identified six key elements of Career Pathways. This Initiative provides a framework for development and implementation of career pathways models. Elements of this framework are included in the development of the Manufacturing Career Pathways for the Lehigh Valley guide.

The US Department of Labor – Employment and Training Administration (2011g) recently defined career pathway programs as a clear sequence of education coursework and/or training credentials that include the following components:

- Are aligned with the skill needs of industries important to the regional or state economies in which they are located, and reflect the active engagement of employers in targeted industry sectors regarding the skill requirements for employment or career progression in high demand occupations.
- Include the full range of secondary, adult education, and postsecondary education options, including registered apprenticeship, with a non-duplicative progression of courses clearly articulated from one level of instruction to the next, with opportunities to earn postsecondary credits and lead to industry-recognized [and/or] postsecondary credentials;
• Include curriculum and instructional strategies that make work a central context for learning (contextual learning) and help students attain work readiness skills;
• Include, as appropriate for the individual, integrated education and training that combine occupational skills training with adult education services, give credit for prior learning, and adopt other strategies that accelerate the educational and career advancement of the participant.
• Lead to the attainment of an industry-recognized degree or credential, which may include stackable credentials of value in the labor market and that articulate progressively to higher-level credentials or degrees.
• Help a worker enter or advance within a specific sector or occupational field, regardless of their skills at the point of entry.
• Include academic and career counseling, wrap-around support services particularly at points of transition, and support the development of an individual career plan.
• Are organized to meet the particular needs of adults, including childcare, accommodating work schedules with flexible and non-semester-based scheduling, alternative class times and locations, and the innovative use of technology.
• Have the goal of increasing an individual’s educational and skills attainment and employment outcomes. (US Department of Labor, 2011g, *Six key elements of career pathways chart and definition*, p. 2)
Section 1: Manufacturing Industry
Overview of the Manufacturing Industry

The North American Industry Classification System defines manufacturing in the following manner,

The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products.

Establishments in the Manufacturing sector are often described as plants, factories, or mills and characteristically use power-driven machines and materials-handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector. Manufacturing establishments may process materials or may contract with other establishments to process their materials for them. Both types of establishments are included in manufacturing (as cited on U.S. Department of Labor, 2011, Bureau of Statistics, Industries at a Glance, Manufacturing).

Manufacturing in Pennsylvania

Manufacturers in Pennsylvania account for 12.5 percent of the total output in the state, employing 10 percent of the workforce. Total output from manufacturing has ranged from $64 to $71 billion for the past several years; it was $68.5 billion in 2009. In addition, manufacturing compensation is just over 44 percent higher than other nonfarm employers in the state.

Manufacturing Output and Exports

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania Total Manufacturing Output</td>
<td>$68.5 billion (2009)</td>
</tr>
<tr>
<td>Manufacturing’s Share of Total GSP</td>
<td>12.5% (2009)</td>
</tr>
<tr>
<td>Manufacturing’s Share of PA’s Exports</td>
<td>90% (2010)</td>
</tr>
<tr>
<td>Total Employment Related to Manufactured</td>
<td>258,200 (2008)</td>
</tr>
</tbody>
</table>

Smelzer, M. (n.d.)
According to *Critical Shortages of Precision Machining and Industrial Maintenance Occupations in Pennsylvania’s Manufacturing Sector* (The Pennsylvania Center for Advanced Manufacturing Careers, 2010), Pennsylvania’s manufacturing sector drives our economy, employing more than 550,000 individuals in family-sustaining jobs and generating 14 percent of the state’s total gross product. Innovations in manufacturing are broad and long-standing, as is evidenced by the number and variety of American household products invented and manufactured in Pennsylvania, including:

**Hershey Chocolate** in Hershey  
**Tastykake** in Philadelphia  
**Marshmallow Peeps** (Just Born Candy Company) in Bethlehem  
**K’NEX** toys in Hatfield  
**Crayola** crayons in Easton  
**The Slinky** in Hollidaysburg  
**Martin** guitars in Nazareth  
**Zippo** lighters in Bradford  
**Nestlé Water** in Allentown  
**The Shop-Vac** in Williamsport

While they are strongly rooted in the past, Pennsylvania’s manufacturing industries continue to grow toward the future. Pennsylvania’s renewable wind energy industry is growing rapidly with 17 wind farms supporting a wide range of manufacturing jobs. Pennsylvania is also on the leading edge of pharmaceutical and medical device manufacturing, providing everything from the simple medications that we use on a daily basis to precision surgical instrumentation.

Today’s manufacturing occupations are clean and modern, filled with high technology, automation and robots. Manufacturing offers excellent process-improvement strategies to compete globally and help lead the country out of its economic downturn, employing a highly skilled, highly motivated workforce. Whether your interests lie in improving the layout and efficiency of a company through industrial engineering or designing custom tools that enable a company to produce its product through a career as a tool and die maker, the manufacturing sector has the career for a lifetime.

Over the past 10 years, much of the manufacturing growth in Pennsylvania was fueled by process and productivity improvement, often coupled with the introduction of new
technologies. As a result, employers did not always need more workers to meet increasing demand, but they did require a significantly more skilled workforce. Low-skill production jobs often either moved offshore or were replaced through automation. Newly installed capital equipment required more capable operators and skilled technicians to maintain the equipment. The Advanced Materials and Diversified Manufacturing (AMDM) industry partnerships (IP) and the PA Center for Advanced Manufacturing Careers are ideally positioned to respond to the evolving needs of manufacturing employers and workers.

This vibrant, growing sector of Pennsylvania’s economy is not without its challenges. As Pennsylvania’s economic recovery accelerates, our manufacturing sector will be challenged by higher skill requirements, an aging workforce and the lack of an effective talent pipeline. The commonwealth’s manufacturers must have access to a deeper pool of skilled and adaptable workers in order to respond to the competitive demands of a rapidly evolving global economy. Pennsylvania workers, recognizing this new reality, seek opportunities to develop new skills (pp. 5-6).

**Pennsylvania Manufacturing Industry Partnerships**

- The Pennsylvania Center for Advanced Manufacturing Careers (PCAMC)
- Pennsylvania Center for Energy and Green Careers
- Local Workforce Investment Boards
- Manufacturers Resource Center
- PA CareerLink®
- Industrial Resource Centers
- Regional Career and Education Partnerships
- Regional Manufacturing Industry Partnerships
- National Association of Manufacturers (NAM)
- The National Fund for Workforce Solutions
- National Association of Manufacturers (NAM)
- The Manufacturing Institute
- National Fund for Workforce Solutions
Manufacturing in the Lehigh Valley

Storied History
The Lehigh Valley has a rich history of manufacturing, most notably with Bethlehem Steel—the builder of 1,127 ships during World War II and of the Golden Gate Bridge, the supplier of metal for every bridge and tunnel from New Jersey into Manhattan, and for much of the skyline you see when you get there.

The Bethlehem Steel Corporation (1857–2003), was based in Bethlehem, Pennsylvania. At one time, Bethlehem Steel was the second-largest steel producer in the United States. Due to the decline in the U.S. steel industry combined with management problems, the company was forced into bankruptcy in 2001. Shortly thereafter, the company was dissolved and all remaining assets were sold to International Steel Group (ISG). In 2005, ISG merged with Mittal Steel, ending U.S. ownership of Bethlehem Steel.

Well we're living here in Allentown, And they're closing all the factories down Out in Bethlehem they're killing time, Filling out forms, Standing in line.

Billy Joel
“Allentown” 1982

The Wikipedia entry on Bethlehem Steel states,

Inexpensive steel imports and the failure of management to innovate, embrace technology, and improve labor conditions contributed to Bethlehem's demise. Critics of protectionist steel trade policies attribute the cause of this lack of competitiveness to American steel producers like Bethlehem having been shielded from foreign competition by quotas, voluntary export restraints, minimum price undertakings, and antidumping and countervailing duty measures which were in effect for the three decades preceding Bethlehem Steel's collapse. (2011, Closing and bankruptcy, para. 2)

Steelworkers are known to have endured long, hot hours of manual labor in the mills. This description of a manufacturing job of the past is accurate; however, today's manufacturing jobs are quite different.
Manufacturing Today
Despite the decline of Bethlehem Steel, the Lehigh Valley still supports a wide range manufacturing companies. While their products range from candy to advanced medical equipment and technologies, the skills and technology to develop and create those products are related.

In August 2011, the Lehigh Valley Manufacturing Summit was held as a call to action for private sector employers, workforce development groups, and education and economic development organizations to identify regional initiatives to increase youth and job seekers’ awareness of the thriving manufacturing industry sector.

The main points from the summit follow:

• Today's economy is producing the same amount of goods and services (GDP) that it did before the recession started...with 7 million fewer people employed. That means that industry has become more productive through technology, automation, and improved systems. Some plants operate dark third shifts where most production is totally automated.

• The Lehigh Valley’s economy and wealth was built by manufacturing...however, the look of manufacturing is different now, needing more brains than brawn. The Lehigh Valley Workforce Investment Board’s mission is to have a world-class competitive workforce focusing on targeted industry clusters that build wealth and provide family-sustaining wages.

• Fourth quarter 2010 data shows that there are 759 manufacturers in the Lehigh Valley with 28,312 workers (10% of all Lehigh Valley jobs), paying an average yearly wage of $58,864 which is 24% above the average Lehigh Valley wage. The manufacturing sector added 500 jobs last month and is now employing 1,000 more people than a year ago...this was the ninth consecutive monthly increase. Manufacturing also has the highest economic activity multiplier: Every dollar spent on manufacturing activity generates 3 to 4 dollars of overall activity, as compared to other sectors which only generate about 2 dollars.

• Industry Partnerships bring together industry, workforce development, education, and economic development throughout PA to identify and address common workforce needs and provide resources to train incumbent workers. One of five in the Lehigh Valley, the Lehigh Valley Diversified Manufacturing Industry Partnership has received more than $2 million from the PA Department of Labor and Industry to train 2,700 workers for credential attainment and involve over 116 members.

• PA Center for Advanced Manufacturing Careers has worked with Lehigh Valley Industry Partnerships to get employer feedback and publish reports that address occupational shortages in precision machining and mechatronics and increase the awareness of manufacturing careers.

• CareerLinking Academy is a week-long youth and adult career awareness and preparation program that gives participants a look into the world of work through job shadowing, industry tours, employer panels, interviewing skills, resumes and applications, soft skills training, etiquette and much more. An Academy has been created to focus on Science, Technology, Engineering and Math (STEM) disciplines which [sic] are critical to manufacturing. (E-mail communication, September 13, 2011)
The Lehigh Valley has a diverse group of manufacturers that routinely gather to share ideas and experiences. Through Pennsylvania’s Industry Partnerships, the Lehigh Valley has maintained a vibrant employer network with clearly stated goals and objectives.

The following list is a sample of Lehigh Valley Manufacturing employers that may be participating members of the Manufacturing Industry Partnerships:

<table>
<thead>
<tr>
<th>ABEC</th>
<th>Air Products</th>
<th>Ashland Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlas Machining &amp; Welding, Inc.</td>
<td>B Braun Medical Inc.</td>
<td>Bracalente Manufacturing</td>
</tr>
<tr>
<td>Bracalente Mfg. Company, Inc.</td>
<td>C. F. Martin &amp; Co., Inc.</td>
<td>Cleveland Steel</td>
</tr>
<tr>
<td>Computer Designs</td>
<td>Crayola</td>
<td>Cryomachinery</td>
</tr>
<tr>
<td>Eastern Surfaces</td>
<td>Eisenhardt Mills, Inc.</td>
<td>Essroc</td>
</tr>
<tr>
<td>Innovative Office Products</td>
<td>Just Born</td>
<td>Kraft Foods</td>
</tr>
<tr>
<td>Lehigh Valley Plastics</td>
<td>Lightweight Manufacturing, Inc.</td>
<td>Loikits Industrial Services, Inc.</td>
</tr>
<tr>
<td>Mack Trucks</td>
<td>Mancor Industries</td>
<td>Morgan Advanced Ceramics</td>
</tr>
<tr>
<td>Nestlé Purina</td>
<td>Nestlé Waters</td>
<td>OraSure</td>
</tr>
<tr>
<td>Palram Americas</td>
<td>Piramal Critical</td>
<td>Samuel Adams Pennsylvania Brewery</td>
</tr>
<tr>
<td>Sharp Corporation</td>
<td>Tioga Pipe</td>
<td>Victaulic</td>
</tr>
</tbody>
</table>

Wacker Chemical
Manufacturing Education and Training

Advanced Manufacturing Competency Model
As stated on the Manufacturing Institute website:

The evolution to the Skills Certification System began with a 2-year development of the Advanced Manufacturing Competency Model, announced in May 2006 by the Manufacturing Institute. This model, built by manufacturers, for manufacturers, is essentially a roadmap of the skills needed by workers entering and then advancing in careers across the manufacturing economy (Manufacturing Institute, 2011b, para. 1).

The Manufacturing Institute—an organization dedicated to manufacturing research, education, and industry development—has emphasized the “core or basic skills that cut across all sectors of manufacturing” (Manufacturing Institute, 2011a). These primary skills are:

- Personal Effectiveness Skills – for example, will prospective employees show up on time, ready for work;
- Basic Academic Requirements – for example, will prospective employees have the basic math and reading skills needed;
- General Workplace Competencies – for example, can the prospective employees work in teams;
- Industry-wide Technical Competencies – for example, will prospective employees understand the basics of manufacturing (Manufacturing Institute, 2011b).

This visual representation depicts how these competencies build on and link to each other:

(US Department of Labor, 2011b, *Advanced manufacturing competency model*)
Progression of Education and Training

There are many occupations within the manufacturing industry that require higher levels of education; however, there are also many that only require a high school diploma or equivalent. Most occupations in the manufacturing industry require employees to participate in continuous on-the-job training. Following is a list of educational options available to prepare people for occupations in manufacturing:

- High School Diploma or Commonwealth Secondary School Diploma/GED
- High school career center program articulated with community college industrial training
- Adult Education Providers
- Work Ready Credentials
- National Career Readiness Certificate/WorkKeys®
- Proprietary Schools
- Career and Technology Centers
- Postsecondary Vocational Training
- Employer Recognized Certificates
- Nationally Recognized Certificates
- Associate Degree
- Bachelor of Science Degree
- Master of Science Degree

(Jenkins & Spence, 2006, p. 9)
Certifications and Credentials

During the Career Pathways Initiative, Credentials that Count Spring Institute (2011), information was presented to support the importance of certificates and credentials. For example, in the Attainment into Career Pathway Approaches: The What and Why panel discussion Peter Joyce, director of MPR Associates, said,

Simply stated, credentials and certificates are awarded by a training provider based upon completion of coursework. This coursework can include the completion of education and training requirements based on a narrow range of specialized knowledge or skill.

Labor market research indicates that most certificates of one year or more have significant value in the labor market; however, neither certificates nor certification are the "ticket" for a job – even in high growth areas. The value of certificates and credentials is determined by communication between employers and training systems. (public presentation, April 26, 2011)

The National Association of Manufacturers (NAM)-Endorsed Manufacturing Skills Certification System is a system of stackable credentials applicable to all sectors in the manufacturing industry. Earned credentials can strengthen an individual’s ability to be mobile in the workforce, compete for higher-level jobs, and move to in-demand careers by providing skills and competencies recognized industry-wide. Stackable credentials also provide career pathways that clearly map to educational pathways, and, are tied to credentials preferred by employers in multiple sectors.

Manufacturing Paths
The Manufacturing Institute’s Skills Certification Overview (2011c) provides ample opportunity to promote the value of certifications in manufacturing. This presentation illustrates the NAM Manufacturing Institute’s Skills Certification System career ladder which illustrates that learning is a continuum throughout a worker’s life as more competencies are acquired and documented with a recognized credential.
Stackable Credentials

Stackable credentials generally describe an education and training framework that are typically designed to begin with low-wage, low-skilled adults that progress through Adult Basic Education, non-credit occupational training, and for-credit postsecondary degree and certificate programs. In other words, a stackable credentials framework provides adult learners opportunities to obtain credentials and work through career pathway models. Importantly, these career pathway models and the credentials are built around occupations and industries with high unmet needs for skills. Examples of stackable credentials are:

- **For Work Ready Candidates**
  - National Career Readiness Certificate (NCRC) issued by ACT® (Bronze, Silver, Gold, Platinum)
  - NCRC Plus (Skill Categories include: Work Discipline, Teamwork, Managerial Potential, Customer Service Orientation)

- **For Certified Production Technicians**
  - The Manufacturing Skill Standards Council’s (MSSC) Certified Production Technician (CPT) - (Credentialed Assessments in: Safety, Quality Practices & Measurement, Manufacturing Processes & Production, and Maintenance Awareness), Certified Logistics Associate (CLA), Certified Logistics Technician (CLT)
• **For Certified Machinists and Metalformers**
  
  o National Institute of Metalworking Skills (NIMS) - Certifications range from entry level to master level, stackable credentials in the following areas: Machining, Metalforming, Stamping, Press Brake, Slide Forming, Screw Machining, Die Making, Machine Building, & Machine Maintenance, Service, and Repair.

  NIMS has developed skills standards in 24 operational areas covering the breadth of metalworking operations including metalforming (Stamping, Press Brake, Roll Forming, Laser Cutting) and machining (Machining, Tool and Die Making, Mold Making, Screw Machining, Machine Building and Machine Maintenance, Service and Repair). The Standards range from entry (Level I) to master level (Level III). All NIMS standards are industry-written and -validated, and are subject to regular, periodic reviews under the procedures accredited and audited by ANSI.

• **For Certified Welders**
  
  o American Welding Society (AWS) Certified Welder Certifications

• **For Certified Technologists and Engineers**
  
  o Society of Manufacturing Engineers (SME) - The Certified Manufacturing Technologist (CMfgT) and The Certified Manufacturing Engineer (CMfgE)
Section 2: Career Pathways
Introduction to Career Pathways

Career pathways focus on the education and employment needs of adults. Jenkins (2006) describes these pathways as,

a series of connected education and training programs and support services that enable individuals to secure employment within a specific industry or occupational sector, and to advance over time to successively higher levels of education and employment in that sector. (p.6)

In developing these programs the the ABE Career Connections: A Manual for Integrating Adult Basic Education into Career Pathways (MPR Associates, 2010) notes that “significant up-front planning and development time” (p. 7) is needed.

Development and Implementation
Successful career pathways systems are built on relationships and clear lines of communication between public and private partners. The five steps, suggested in The Breaking Through Practice Guide (Jobs for the Future, 2010), for developing and implementing career pathways are described below. At all stages of the process, outreach is imperative, as is support and participation from stakeholders, such as jobseekers, businesses, educational institutions, and government agencies.

Gap Analysis
Gather education, workforce development, economic development, employer, and labor groups to identify sectors of importance to local economies, and map the requirements of entry and advancement at successive levels in each sector. Conduct a gap analysis to assess how well existing education, workforce, and social services support worker access and advancement in the target fields, identifying challenges and weaknesses.

Career Pathways Planning
With input or guidance from business and industry, convene front-line staff from partner agencies, including education, workforce, and social services, to rethink partner programs and services to support career entry and advancement in the target sector(s). Identify costs and develop a funding strategy.

Implementation
Plan for program development, marketing and recruitment, delivery of programs and support services, job development, and outcomes tracking. Consider implementing strategies in stages.
Continuous Improvement
Systematically track education and labor market outcomes at each level, and continually modify programs and services to support advancement. Continue to evaluate program changes to ensure that they produce the desired improvements.

Expand the Pathways
Bring the pathways model to scale to serve larger numbers of students and employers. Adapt the approach for replication in other sectors of importance to the regional economy or to other populations of jobseekers.

These steps represent a continuous improvement process that, if done correctly, can have a systemic and sustainable impact on the performance of the partner organizations.
Referrals to Career Pathways Programs

To direct students to the most appropriate courses, programs, and services, career pathways partners that provide support services need to consider four broad areas—informally or formally—through a tool or metric. Assessments can be conducted during the enrollment or intake period, however, many partners also conduct ongoing assessments of students.

Coordinating Marketing, Recruitment and Intake

- How are participants at each stage of the process recruited, and by whom? Have any of the partners conducted market research to determine the most effective sources and methods of recruitment?

- What are the characteristics of participants in current programs at each level in the target sector(s)? Where do these individuals come from (e.g., directly from high schools, community organizations, workplaces, etc.)? What motivated them to enter these programs? How did they learn about the programs? What barriers to access did they face?

- Are there other sources of participants that have not been tapped for the programs at each level? Have providers considered recruiting individuals who might not otherwise participate in post-secondary occupational education and training? (Examples might include low-wage workers in the target sectors, workers displaced from other industries, college students who have not yet declared a major, or individuals who have applied for jobs or training in the field, but lack the necessary qualifications.)

- How can the partner organizations collaborate to strengthen marketing of career pathway programs, particularly to potential participants who are disconnected from existing education and workforce systems?

- What can be done to allow participants to enroll in a career pathway sequence through any partner organization operating at any given level of the pathway?

- To what extent can provider partners employ common (or at least coordinated) entrance standards and assessments to facilitate articulation among education and training programs at different levels?

(Jenkins & Spence, 2006, p. 15-16)
### Program Design

#### Career Awareness

When integrating career awareness into instruction, students should be made aware of the job information fields. The descriptions below, from the U.S. Department of Labor’s CareerOneStop website, can be used to compare and contrast employer expectations and the differences between industries and/or occupations.

<table>
<thead>
<tr>
<th>Job Title</th>
<th>A designation that indicates an individual's official position in an organization. A job title often indicates an individual's authority and responsibilities as well as the activities and duties performed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Level</td>
<td>Job level indicates position of a particular job within an organization or industry. Some examples of job levels are entry-level, mid-level, management-level, executive-level, or entrepreneur.</td>
</tr>
<tr>
<td>Job Description</td>
<td>A job description is a statement of the work performed in a job, how that work is accomplished, and why the work is performed. Job descriptions can include information regarding job tasks as well as the tools and technology used to perform tasks.</td>
</tr>
<tr>
<td>Perform Supervisory Duties?</td>
<td>Some jobs have a supervisory component that is not explicit in their list of tasks. Other jobs clearly list supervisory duties among tasks. A supervisor is responsible for the day-to-day actions of a group of employees and represents employee issues to higher level management.</td>
</tr>
<tr>
<td>Education</td>
<td>Most organizations have specific education requirements an individual must fulfill in order to be considered qualified for a position. Educational requirements vary by the organization and the type of job but some examples include a high school diploma, some college, post-secondary certificate, and Master's degree.</td>
</tr>
<tr>
<td>Workforce Preparation</td>
<td>Most jobs have specific training requirements an individual must fulfill to be considered proficient at a job. Many different types of training exist; some types are apprenticeship training, on-the-job training, and in-plant training.</td>
</tr>
<tr>
<td>Duration</td>
<td>Training requirements for jobs can vary widely in duration. Some formal training programs can last more than 10 years while others can last less than one month.</td>
</tr>
<tr>
<td>Work Experience</td>
<td>Work experience is the know-how an individual gains when working in a job. Some employers expect individuals to have prior work experience in a related job to be considered for a position.</td>
</tr>
</tbody>
</table>
Can work experience and education substitute for each other?

While some employers may establish both work experience and educational requirements, other employers may accept work experience in lieu of an educational requirement or vice versa.

For example, one job may require both a Master's degree and 5 years of related work experience while another job may accept either a Master's degree with no related work experience or a Bachelor's degree with 5 years of related work experience.

Licensure

Licensure is a state's grant of legal authority to practice the profession within a designated scope of practice. Licensure prohibits anyone from practicing a profession who is not licensed, regardless of whether the individual has been certified by a private organization.

Certification

Certification is an often voluntary process where individuals meet established standards to demonstrate their competence, experience, knowledge and skill in a particular profession or occupation to employers and the public.

Salary/Wages

Salary is the amount of gross income a job provides for one year. If salary information is unavailable you can also record hourly wage estimates. A wage is the amount of income a job provides that is received on an hourly, daily, or weekly basis.

Employment Outlook

Employment outlook is an estimation of future growth of an occupation. Employment outlook can be represented by employment increase in number of jobs (employment in 2006 = 3,800 and estimated employment in 2016 = 4,830) or percentage of growth increase (27% percent increase in employment from 2006 to 2016).

References

Record resources and/or notes you may need when revising or updating this career ladder/lattice. For example, copy and paste searched job titles and related codes as well as links to Web sites used to complete the job information fields.

(U.S. Department of Labor, 2011d, Appendix A)

Contextualized Instruction

Individuals who access career pathways services may find themselves in need of the basic skills required to obtain, retain, and advance on the job. Remedial programs that prepare adults for entry level jobs should provide contextualized instruction that use authentic workplace materials to provide instruction in reading, writing, and math.

For adult learners currently working or seeking employment, the workplace can serve as an excellent basis for contextualizing instruction. Work-based learning uses common work-related situations, or actual workplace problems and materials to frame the instruction and practice of literacy skills. Learners may practice reading comprehension using the employee handbook or hazardous materials statements. Mathematics skills may be incorporated into inventory control practices, cash register use, or calculations for laying carpet. Learners can write step-by-step
directions, create resumes or type shift reports. Each of these activities builds literacy skills within the context of job-related tasks.

Instructors planning to implement work-based learning can become familiar with the range of jobs available in the community, as well as work-related materials and situations likely to arise. Instructors can visit job sites, shadow workers, and even interview employees to gain information to assist with instruction. Often employers will contribute sample workplace materials for use in classes. Instructors may also include job-searching activities in work-based instruction.

**Support Services**
To direct students to the most appropriate pathways, programs, and services, support-services partners should assess students in four areas: academics, learning styles and differences, aptitudes and strengths, and internal and external factors. Assessments can be administered during the enrollment, orientation or intake period, but many partners also conduct ongoing assessments of students.

**Academic**
This is the most common type of assessment used for career pathways programs; it is used to determine what courses students are prepared to take. There are a few nationally recognized assessments, such as ACCUPLACER® and COMPASS®. A number of colleges use these assessments to determine if students need to take developmental education courses before starting for-credit coursework, and if so, at what level they need to start. For students in Adult Education, colleges and adult education partners often use the Test of Adult Base Education® (TABE) or CASAS to assess skill level.

**Learning Styles and Learning Differences**
This type of assessment can help faculty and staff understand what instructional approaches will work best with students. Assessments of learning style help instructors know whether students are visual, auditory, or other types of learners, which can help in customizing content. Low-skilled adults entering community colleges may have undiagnosed learning disabilities; these types of assessments can test for dyslexia or other disabilities that require a different instructional approach or additional support services.

**Aptitudes and Strengths**
Teachers, case managers, and career coaches helping students choose a career path may use multiple assessments to measure students’ interests, strengths, and basic aptitudes. These range from general questions about attitudes and preferences to specific questions about job
activities. These assessments can help students choose career training paths that will be good fits for them, which in turn makes it more likely that they will succeed in their career pathway.

**Internal and External Factors**
Support staff taking a comprehensive approach to working with career pathways students may also want to examine the internal and external barriers to students’ success. For example, it is helpful to know if students have jobs, children to care for, stable housing, and consistent access to transportation.

Students may require support services to address any of the factors highlighted above. In *The Breaking Through Practice Guide* (Jobs for the Future, 2010), some possible services include the following:

<table>
<thead>
<tr>
<th>Academic</th>
<th>Non-academic</th>
<th>Financial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutoring (one-on-one, group tutoring, drop-in centers)</td>
<td>Learning communities in which a group of students take classes together and engage in activities together</td>
<td>Emergency funds for short-term crises (e.g., loss of housing, medical emergencies)</td>
</tr>
<tr>
<td>On-line and computer-based tutorial/skill development programs</td>
<td>Coaching/case management/counseling in which an assigned coach or staff person provides intensive support to help students work through crises and life challenges</td>
<td>Subsidies for books, transportation, supplies</td>
</tr>
<tr>
<td>Study groups</td>
<td>Peer mentoring programs</td>
<td>Food or clothing</td>
</tr>
<tr>
<td>College success courses; study skill courses</td>
<td>Referral services to outside social service agencies, health services, housing assistance, etc.</td>
<td>Child care</td>
</tr>
<tr>
<td>Testing and accommodations for learning disabilities</td>
<td>Peer mentoring programs</td>
<td></td>
</tr>
<tr>
<td>Academic advising to help with course selection and choosing a major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career counseling to help students choose a career field and search for jobs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(p. 15)
United States Department of Labor Competency Model Clearinghouse

The U.S. Department of Labor, Employment and Training Administration has developed the Competency Model Clearinghouse which offers a Career Ladder/Lattice Tool that can be helpful in developing industry career paths. This tool, used in conjunction with The U.S. Department of Labor’s Building Blocks for Competency Models Tool, can be used by businesses, educators, and workforce professionals to create materials as well as outline careers and experiences individuals should acquire in order to advance within a particular industry.

The following explains the Building Blocks for Competency Models found on the U.S. Department of Labor’s CareerOneStop website:

The Building Blocks for Competency Models consist of a set of "building blocks" for competency model development. These "building blocks" are arranged in nine tiers with each tier containing a set of related competencies. The arrangement of the tiers in a pyramidal shape represents the increasing level of specificity and specialization of content. As a user moves up through the various tiers of the model, the competencies become specific to certain industries and/or occupations. The nine tiers are grouped into three categories:

**Occupation-Related Competencies**
- Tier 9 – Management Competencies
- Tier 8 – Occupation-Specific Requirements
- Tier 7 – Occupation-Specific Technical Competencies
- Tier 6 – Occupation-Specific Knowledge Competencies

**Industry-Related Competencies**
- Tier 5 – Industry-Sector Technical Competencies
- Tier 4 – Industry-Wide Technical Competencies

**Foundational Competencies**
- Tier 3 – Workplace Competencies
- Tier 2 – Academic Competencies
- Tier 1 – Personal Effectiveness Competencies

**Foundational Competencies**
At the base of the model, Tiers 1 through 3 represent competencies that provide the foundation for success in school and in the world of work. Foundational competencies are essential to a large number of occupations and industries. Employers have identified a link between foundational competencies and job performance and have also
discovered that foundational competencies are a prerequisite for workers to learn industry-specific skills.

**Industry-Related Competencies**
The competencies shown on Tiers 4 and 5 are referred to as Industry Competencies and are specific to an industry or industry sector. Industry-wide technical competencies cut across industry sub-sectors making it possible to create career lattices where a worker can move easily across industry sub-sectors. Rather than narrowly following a single occupational career ladder, this model supports the development of an agile workforce.

**Occupation-Related Competencies**
The competencies on Tiers 6, 7, 8, and 9 are referred to as Occupational Competencies. Occupational competency models are frequently developed to define performance in a workplace, to design competency-based curriculum, or to articulate the requirements for an occupational credential such as a license or certification. (Department of Labor, 2011d, “Competency model general instructions,” para. 2-8)
Section 3: Career Pathway Maps
Using Career Pathway Maps

Information from the Career Ladder/Lattice General Instructions page found on the CareerOneStop website (U.S. Department of Labor, 2011c) indicates the following:

Career ladders and lattices consist of a group of related jobs that comprise a career. They often include a pictorial representation of job progression in a career as well as detailed descriptions of the jobs and the experiences and education that facilitate movement between jobs. While career ladders show vertical movement between jobs, career lattices contain both vertical and lateral movement between jobs. In today’s work environment, this might be a better representation of the career path (map) an individual can follow (para. 2-3).

Employers, Workers, and Job Seekers

Employers that use career pathway maps within their organizations can help potential employees see the route to where they want to go and be able to advance. When the path is clear, they are more likely to get there—and less likely to leave.

Mapping tools can also be used by human resource departments to strategize for the identification of vacancies. Mapping tools can be customized to communicate job descriptions, education and skill requirements, and experience to ensure that potential employees are prepared for the jobs for which they may be hired. Maps can also be tailored to include degrees, certifications, permits, licenses, and any other credentials required of particular job titles within a company. These tools can be incorporated into interviewing and orientation practices. Within a company, maps can provide job information that can serve as a basis to better recruit, select, coach, develop, train, and reward staff. Early on, employees can be made aware of opportunities for growth and promotion within the company.

Job seekers and those currently employed are increasingly encouraged to update and expand skills that will improve their potential for success in the workplace. Mapping tools can help to identify skills, build skills, and progress to other jobs within the company. Clearly defined career pathway maps are essential to assist workers on establishing career goals.

Workforce Development

As career pathway maps are being developed, it is important that the information contained within the tools is clear, up-to-date, and research-based. If thoughtfully constructed, these tools can help workforce development partners move people into secure careers that offer
long-term employability. Many resources are available to help identify the best industries and identify career pathways so partners can offer job seekers sound career options.

The Center for American Progress (Choitz, Soares, & Pleasants, 2010) reported that promising career development programs incorporate the following key features:

- Tailor services to labor market trends,
- Tailor services to individual needs and cover a broad range of education and training levels, and
- Form local partnerships with community-based organizations, colleges, and employers (p.3).

Each step on a career pathway is designed explicitly to prepare for the next level of employment and education. (Jenkins & Spence, 2006, p. 2)

Workforce development program staff can use career pathway maps as they incorporate these key features in their career awareness and development workshops. These maps can guide incumbent workers and job seekers through the process of researching current and projected labor market trends to be considered, among other factors, when making career decisions.

**Educators**

Teachers and career counselors can use career pathways maps with students to help them understand the education and experience needed to enter employment within a potential industry and also to gain a perspective on the additional education and experience needed to move up a career pathway once employed within an industry. Career pathway maps show, at a glance, a progression of occupations, salary, education and certifications needed, as well as educational institutions available in the area. Teachers can use these maps to inform students of the variety of occupations available within an industry and the salary they can expect. These career pathway maps may focus on the entry level positions and show potential pathways that could be followed to move up with an employer. These career pathway maps could be used to help students set short and long-term educational and employment goals.

In the classroom, teachers and career counselors can use the career pathway maps as a basis for a lesson on career awareness. For example, teachers can review and discuss a career pathway map in class. Students could then research their local labor market to identify potential employers and employment requirements. They may even be able to identify potential openings, on-the-job training opportunities, and career pathways within a company. There may be many entry points for employment. As potential employees, students need to be aware that they will be expected to continue to upgrade their skills in order to be promoted or apply for a higher level position along a career pathway. If students have past experience, teachers could use the career pathway maps to show where their experience might allow them to enter at a higher level entry point with an employer.
Instruction should start at the lowest level of skill competencies and build on prior knowledge. When creating lesson plans, ensure that all students have the basic foundational competencies required for the workplace. Then, focus on the industry specific topics. Once students have an understanding of the workplace and the targeted industry, instruction can move into occupation specific topics. The goal is to increase awareness of the workplace, then targeted industries, and finally, the various occupations or opportunities available within an industry. Teachers should be helping students to make informed decisions and bring awareness to the educational and career opportunities available along various career paths.

**PA CareerLink® Lehigh Valley Career Pathways**

The following career pathway map is a visual representation of services and pathways available upon enrolling in PA CareerLink® Lehigh Valley. Job seekers, dislocated workers, incumbent manufacturing workers, or high school graduates could enter at various steps in the process and progress through this career pathway. Once they have worked their way through this pathway, as illustrated on page 36, they are prepared for entry-level employment in manufacturing. Additionally, job seekers may choose to participate in additional PA CareerLink® Lehigh Valley services as illustrated on pages 38-39 or enter a manufacturing career.
Manufacturing Industry Career Pathways
PA CareerLink® Lehigh Valley

Enter Manufacturing Career Pathway

Additional PA CareerLink® Services as Appropriate

Prepared for Employment in Manufacturing and Further Education

Manufacturing Industry Specific Instruction
Employer Expectations
Career Pathways in Manufacturing Education/Certifications Required

Enter Job Seeker or Enter Incumbent Manufacturing Worker or Dislocated Worker

Attain National Career Readiness Certificate/WorkKeys®

Enter High School Graduate

Attain Commonwealth Secondary Diploma/GED®

Career Awareness Pre-Employment Instruction Career Exploration

Enroll in PA CareerLink® Lehigh Valley Services

Enter Dislocated Worker

Enter Job Seeker

Manufacturing Career Pathways

The following maps illustrate the options individuals may choose to follow upon completion of the participation of the activities described on the map on page 36. Maps on pages 38 and 39 illustrate the additional PA CareerLink® Lehigh Valley services and the maps on pages 40-60 illustrate manufacturing career pathways. Employees’ levels of education and experience determine where they could enter on the career pathway. If an employee enters with a High School Diploma/Commonwealth Secondary School Diploma/GED®, they might enter at the bottom of the career pathway. If they have manufacturing work experience, a manufacturing certification, an associate degree, or bachelor degree, individuals might enter at various steps above entry level. These visual representations show the various entry and exit points available for employees as they continually gain education and experience within their manufacturing career.
CAREERLINK® INTRODUCTION TO SERVICES
CWDS, Career Readiness Certificate, WIA Information, Career Exploration, etc.

CWDS Enrollment

WIA INTENSIVE SERVICES PATH
TARGET: National Career Readiness Certificate (NCRC) with Intensive Job Search and/or Training

KeyTrain® ASSESSMENT
Assessment Results • Lesson Plans • Remediation for Occupational Goal

WIA INFORMATION SESSION

JOB SEARCH
Pick up WIA Blue Packet at CRC Greeter’s Desk

WORK CONNECTIONS
JOB AND LABOR MARKET

Return completed Blue Packet to the First Floor Reception Desk for assignment to WIA Case Manager for program eligibility appointment.

WIA ELIGIBILITY
INITIAL CASE MANAGEMENT

WorkKeys® NCRC ASSESSMENT

INTENSIVE JOB SEARCH / JOB CLUB

Training / Career Exploration

Pick up WIA Blue Packet at CRC Greeter’s Desk

JOB & LABOR MARKET
CAREER CRUISING (optional)

WORK CONNECTIONS

Return completed Blue Packet to the First Floor Reception Desk for assignment to WIA Case Manager for program eligibility appointment.

WIA ELIGIBILITY
INITIAL CASE MANAGEMENT

WorkKeys® NCRC ASSESSMENT

ON-GOING CASE MANAGEMENT

TRAINING ENROLLMENT

INTENSIVE JOB SEARCH / JOB CLUB

Referral to Computer Assisted Learning Lab (CALS) for intensive KeyTrain® remediation, if necessary

Auxiliary aides and services available upon request to individuals with disabilities.
Equal Opportunity Employer/Program 3/23/11

Introduction to Services Session

- Starting point of PA CareerLink® Services
- 1 ½ hours in length, small group sessions
- PA CareerLink® Website – www.pacareerlink.state.pa.us overview of PA CareerLink® website - post a resume, search for jobs, view training programs, connect with partner programs and other services
- Customers are assisted with enrollment into the website
- Tour of Career Resource Center

Career Resource Center

- This area is the main place of job search activity
- Customers use this according to their own need and schedule and is primarily self-service
- Staff is available to assist customers while they use the services.
- All services are free of charge and open to the general public
- Available services: Computers with internet connection; faxing, mailing, and copying of job search related material; phone banks; various workshops and sessions designed to assist in job search
- Job Search: Customers can post their resumes and search for jobs through the PA CareerLink® website in addition to placing application for positions with local companies
- Workshops include: basic computer, resume writing, job and labor market, financial management, career exploration, internet job search, basic math and reading assessment
- Referral to specific programs based on interest and eligibility

Workforce Investment Act / Trade Adjustment Assistance

- Provides customers who need more intensive one-on-one assistance in re-employment
- Program offers individualized case management and job search assistance
- Customers must meet eligibility requirements
- Customers attend sessions designed to help them in their employment and training goal decisions
  - WIA Information Session
  - KeyTrain® Assessment and remediation if necessary (optional for TAA)
  - WorkKeys® NCRC Assessment – scores aligned to occupational goal (optional for TAA)
  - Job and Labor Market Information
  - Work Connections
- Continued use of the Career Resource Room
- Referral to supportive services
- Case management: Coordinates all services during program participation
- Training Funds: Training from the state approved list, within WIB Targeted Industry Cluster for WIA, and up to the program maximum
- On-the-Job Training: Reimburses employers half of the new employees' wages during the training period
- Intensive Job Search: Includes a weekly Job Club, or meeting, to address job search issues and increase employer contacts in addition to individual contact with job developers to assess employment opportunities

Rapid Response

- Team of Partners provide information to affected dislocated workers
- Sessions are held on site at the company

Trade Adjustment Assistance

- TAA/WIA Dual Enrollment team provides Benefits Rights Interview
- Sessions are held bi-weekly or on-site at the company

Business Services

- Promotes PA CareerLink® Services
- Contacts with customers and employers
- Partners with local Economic Development Agencies
- Conducts sessions on Job and Labor Market Information
- Works with customers enrolled in Job Clubs
- Coordinates On-the-Job Training

Lehigh Valley Professionals

- Self-directed group of professionals
- Addresses difficulties associated with high-level job search
- Resumes posted on local website www.lvprofessional.com

Source of Information:
Manufacturing - Assembly
Lehigh Valley WIA

Supervisors - Production & Operating Workers
SOC Code 51-1011
Entry Level $39,620
Annual Openings 25
Decrease -7.43%

Team Assemblers
SOC Code 51-2092
Entry Level $24,250
Annual Openings 56
Decrease -11.19%

Electrical & Electronic Equipment Assemblers
SOC Code 51-2022
Entry Level $19,980
Annual Openings 15
Decrease -14.29%

Helpers - Production Workers
SOC Code 51-9198
Entry Level $20,690
Annual Openings 40
Decrease -1%

On-the-Job Training
Bachelor's Degree Manufacturing Supervisory Certificate
Postsecondary Education/Training
Certified Production Technician (CPT)
Additional Education/Training
*WorkKeys® Silver Certificate
Lehigh Valley PA CareerLink® Services

Enter Manufacturing - Assembly Career Pathway

Source of Information:
*WorkKeys® Career Readiness Certificate scored as minimum or higher score needed for identified occupation.
Manufacturing Career Pathways for the Lehigh Valley

1. **Tool & Die Makers**
   - SOC Code: 51-4111
   - Entry Level: $38,670
   - Annual Openings: 3
   - Increase: 0%

2. **Numerical Tool & Process Control Programmers**
   - SOC Code: 51-4012
   - Entry Level: $29,630
   - Annual Openings: 9
   - Increase: 0%

3. **CNC Operators**
   - SOC Code: 51-4011
   - Entry Level: $25,690
   - Annual Openings: 6
   - Increase: 5.77%

4. **Machine Tools Operatives**
   - SOC Code: 51-4041
   - Entry Level: $30,050
   - Annual Openings: 16
   - Increase: 3.67%

5. **Extruding & Drawing Machine Operators, Metal and Plastic**
   - SOC Code: 51-4012
   - Entry Level: $31,370
   - Annual Openings: 11
   - Decrease: 3.85%

6. **Multiple Machine Tool Operators, Metal & Plastic**
   - SOC Code: 51-4011
   - Entry Level: $25,470
   - Annual Openings: 6
   - Increase: 10%

7. **Cutting, Punching & Press Machine Operators, Metal & Plastic**
   - SOC Code: 51-4031
   - Entry Level: $22,270
   - Annual Openings: 10
   - Decrease: 19.28%

8. **Molding & Casting Machine Operators, Metal and Plastic**
   - SOC Code: 51-4072
   - Entry Level: $21,730
   - Annual Openings: 6
   - Decrease: 4%

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**Multiple Certifications:**
- Machining Certification
- Metallurgy Certification
- TEAM Fabricating Certification
- TEAM Machining Certification
- TEAM Side Forming Certification
- TEAM Stamping Certification
- TEAM Die Making Certification

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**Entry Level Certifications:**
- Machining Certification
- Metallurgy Certification
- TEAM Fabricating Certification
- TEAM Machining Certification
- TEAM Side Forming Certification
- TEAM Stamping Certification
- TEAM Die Making Certification

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**Additional Education/ Training:**
Manufacturing Career Pathways for the Lehigh Valley

Tool & Die Makers
SOC Code 51-4011
Entry Level $33,670
Annual Openings 3
Increase 0%

Numerical Tool & Process Control Programmers
SOC Code 51-4012
Entry Level $29,830
Annual Openings 8
Increase 0%

CNC Operators
SOC Code 51-4011
Entry Level $33,670
Annual Openings 10
Increase 4%

Machinists
SOC Code 51-4041
Entry Level $30,650
Annual Openings 18
Increase 5.5%

Cutting, Punching & Press Machine Operators, Metal & Plastic
SOC Code 51-4031
Entry Level $22,270
Annual Openings 10
Decrease 16.28%

Extruding & Drawing Machine Operators, Metal and Plastic
SOC Code 51-4021
Entry Level $21,730
Annual Openings 6
Decrease 4%

Molding & Casting Machine Operators, Metal and Plastic
SOC Code 51-4012
Entry Level $21,730
Annual Openings 6
Decrease 4%

Multiple Machine Tool Operators, Metal & Plastic
SOC Code 51-4011
Entry Level $25,670
Annual Openings 6
Increase 10%

Entry Level Certifications:
- Machining Certification
- Metalforming Certification
- Stamping Certification
- Press Brake Certification
- Slide Forming Certification
- Screw Machining Certification
- Die Making Certification

Master Level Certifications:
- Machining Certification
- Metalforming Certification
- Stamping Certification
- Press Brake Certification
- Slide Forming Certification
- Screw Machining Certification
- Die Making Certification

Additional Education/Training

- WorkKeys® Silver Certificate

Manufacturing - Metal and Plastic
Lehigh Valley WIA
Manufacturing - Food Production
Lehigh Valley WIA

Supervisors - Production & Operating Workers
SOC Code 51-1011
Entry Level $39,620
Annual Openings 26
Decrease -7.43%

Bakers
SOC Code 51-3011
Entry Level $16,410
Annual Openings 16
Increase 7.27%

Food Batchmakers
SOC Code 51-3092
Entry Level $21,780
Annual Openings 13
Increase 12.9%

Helpers - Production Workers
SOC Code 51-9198
Entry Level $20,690
Annual Openings 40
Decrease -1%

Enter Manufacturing - Food Production Career Pathway

Source of Information:

*WorkKeys® Career Readiness Certificate levels are determined by highest score received for detailed occupation.

Manufacturing Career Pathways for the Lehigh Valley
Manufacturing Career Pathways for the Lehigh Valley

Manufacturing - Paper Production
Lehigh Valley WIA

Supervisors - Production & Operating Workers
SOC Code 51-1011
Entry Level $39,620
Annual Openings 25
Decrease -7.43%

On-the-Job Training
Bachelor's Degree Manufacturing Supervisory Certificate
Postsecondary Education/Training

SOC Code 51-9106
Entry Level $22,030
Annual Openings 6
Decrease -4.17%

On-the-Job Training

Inspectors, Testers, Sorters, Samplers & Weighers
SOC Code 51-9051
Entry Level $21,930
Annual Openings 18
Decrease -19.91%

On-the-Job Training
Certified Production Technician (CPT)
Additional Education/Training
*WorkKeys® Silver Certificate
Lehigh Valley PA CareerLink® Services

Packaging & Filling Machine Operators/Tenders
SOC Code 51-9111
Entry Level $18,040
Annual Openings 29
Increase 9%

On-the-Job Training

Helpers - Production Workers
SOC Code 51-9198
Entry Level $20,690
Annual Openings 40
Decrease -1%

On-the-Job Training

Enter Manufacturing - Paper Production Career Pathway

Source of information:

*WorkKeys® Silver Certificate is determined by higher scores awarded for better performance.
Manufacturing - Welding
Lehigh Valley WIA

**Structural Metal Fabricator**
SOC Code 51-2041
Entry Level $33,090
Annual Openings 2
Decrease -1.2%

**Sheet Metal Workers**
SOC Code 47-2211
Entry Level $32,470
Annual Openings 8
Decrease -6.25%

**Welders, Cutters, Solderers & Brazers**
SOC Code 51-4121
Entry Level $27,550
Annual Openings 19
Increase 4.23%

** Helpers - Production Workers**
SOC Code 51-9198
Entry Level $20,690
Annual Openings 40
Decrease -.1%

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**Sources of information:**
- CareerOneStop. Retrieved from: [Website].

*Workkeys® Career Readiness Certificate listed as determined by highest score received for verified occupation.*
Manufacturing Career Pathways for the Lehigh Valley
Manufacturing Career Pathways for the Lehigh Valley
Office Personnel - Warehouse
Lehigh Valley WIA

Cargo & Freight Agents
SOC Code 43-5011
Entry Level $22,470
Annual Openings N/A
Increase N/A

On-the-Job Training
Bachelor's Degree
Postsecondary Education/Training

Production, Planning and Expediting Clerks
SOC Code 43-5061
Entry Level $30,060
Annual Openings 17
Increase 0%

On-the-Job Training
Associate's Degree
Postsecondary Education/Training

Office Clerks
SOC Code 43-9061
Entry Level $18,680
Annual Openings 172
Increase 2.58%

Customer Service Representatives
SOC Code 43-4011
Entry Level $22,210
Annual Openings 175
Decrease -1.75%

On-the-Job Training

Shipping, Receiving, and Traffic Clerks
SOC Code 43-5071
Entry Level $20,150
Annual Openings 35
Increase 3.03%

On-the-Job Training

Stock Clerks and Order Fillers
SOC Code 43-9081
Entry Level $15,900
Annual Openings 77
Decrease -1.2%

On-the-Job Training

*WorkKeys® Silver Certificate

Lehigh Valley PA CareerLink® Services


Enter Office Personnel - Warehouse Career Pathway

Manufacturing Career Pathways for the Lehigh Valley
56
Office Personnel - Production
Lehigh Valley WIA

Sales Engineer
SOC Code 41-9031
Entry Level: $45,720
Annual Openings 5
Decrease: -5%
On-the-Job Training

Cost Estimators
SOC Code 17-1081
Entry Level: $37,770
Annual Openings 11
Increase: 11.43%
On-the-Job Training

Technical Writer
SOC Code 27-3042
Entry Level: $37,540
Annual Openings 1
Increase: 0
On-the-Job Training

Production, Planning and Expediting Clerks
SOC Code 43-5081
Entry Level: $26,210
Annual Openings 175
Decrease: -1.75%
On-the-Job Training

Customer Service Representatives
SOC Code 43-0581
Entry Level: $22,210
Annual Openings 175
Decrease: -1.75%
On-the-Job Training

Parts Salesperson
SOC Code 41-2222
Entry Level: $18,810
Annual Openings 6
Decrease: -6%
On-the-Job Training

Bachelor’s Degree
Postsecondary Education/Training

Associate’s Degree
Postsecondary Education/Training

WorkKeys® Silver Certificate
Lehigh Valley PA CareerLink® Services


Enter Office Personnel - Production Career Pathway

Manufacturing Career Pathways for the Lehigh Valley
Office Personnel - Human Resources
Lehigh Valley WIA

Human Resources Manager
SOC Code 11-3040
Entry Level N/A
Annual Openings N/A
Increase N/A

Compensation, Benefits, and Job Analysis Specialists
SOC Code 13-1072
Entry Level $34,290
Annual Openings 8
Increase 1%

Human Resources, Training, and Labor Relations Specialists
SOC Code 13-1079
Entry Level $38,830
Annual Openings 10
Decrease -2%

Human Resources Assistants, except Payroll and Timekeeping
SOC Code 43-4161
Entry Level $27,810
Annual Openings 5
Increase 2%

Bachelor's Degree Human Resource Certificate
On-the-Job Training

Bachelor's Degree Human Resource Certificate
On-the-Job Training

Bachelor's Degree Human Resource Certificate
On-the-Job Training

Bachelor's Degree Human Resource Certificate
On-the-Job Training

Postsecondary Education/Training

Administrative Office Technology Certificate

Enter Office Personnel - Human Resources Career Pathway

Source of Information:
*Note: A Career Readiness Certificate is a benchmark for higher skill levels for identified occupations.

Manufacturing Career Pathways for the Lehigh Valley
58
Office Personnel - Accounting
Lehigh Valley WIA

Accountant
SOC Code 13-2011
Entry Level $42,370
Annual Openings 57
Increase 6%

Bookkeeping, Accounting, and Auditing Clerks
SOC Code 43-3031
Entry Level $27,730
Annual Openings 82
Increase 4%

Billing, Cost, and Rate Clerks
SOC Code 43-3021
Entry Level $26,350
Annual Openings 18
Decrease 5%

Bill and Account Collectors
SOC Code 43-3011
Entry Level $20,890
Annual Openings 62
Increase 2%

Enter Office Personnel - Accounting Career Pathway

Sources of Information:


Manufacturing Career Pathways for the Lehigh Valley
Office Personnel - Software Engineers
Lehigh Valley WIA

Computer Software Engineers, Systems Software
SOC Code 15-1032
Entry Level $61,730
Annual Openings 8
Increase 5%

Computer Software Engineers, Applications
SOC Code 15-1031
Entry Level $56,900
Annual Openings 16
Increase 20.83%

Computer Programmers
SOC Code 15-1021
Entry Level $46,170
Annual Openings 14
Decrease -16.67%

Database Administrators
SOC Code 15-1061
Entry Level $33,500
Annual Openings 5
Increase 14.29%

Enter Office Personnel - Software Engineers Career Pathway

CSQE Certification
Additional Education/Training

On-the-Job Training

Bachelor's Degree MCITP Certification

Sources of Information:

Manufacturing Career Pathways for the Lehigh Valley

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References


Manufacturing Career Pathways for the Lehigh Valley

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