

DO WHAT YOU
LOVE
LOVE WHAT YOU
DO

**MANUFACTURING YOUR CAREER
IN PENNSYLVANIA**

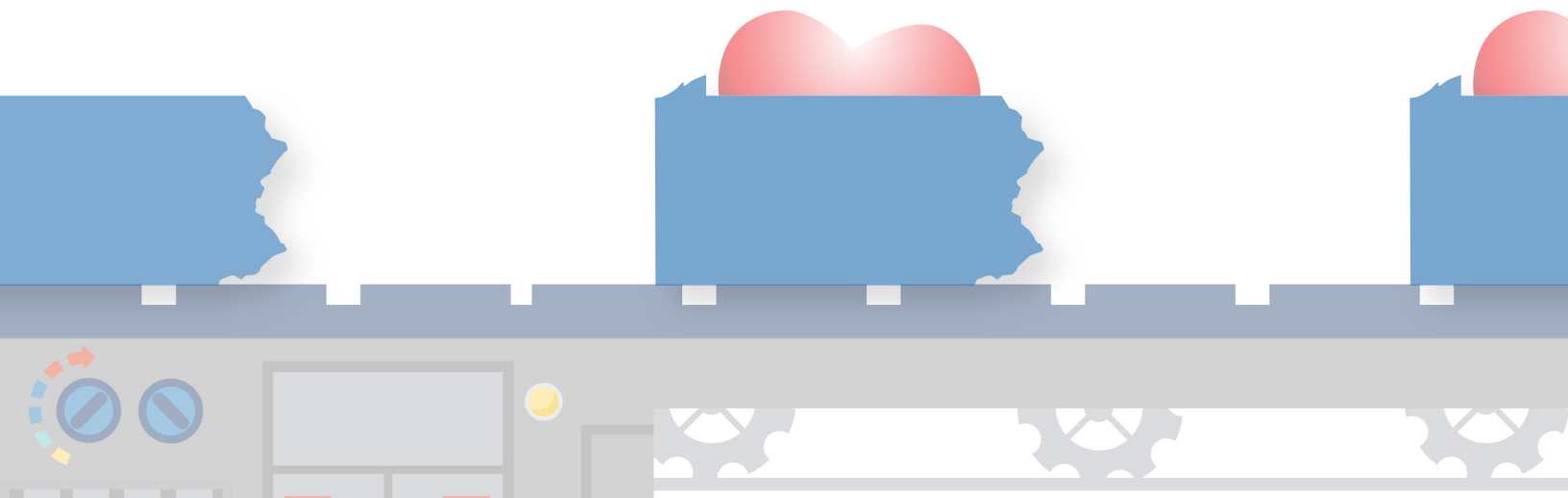


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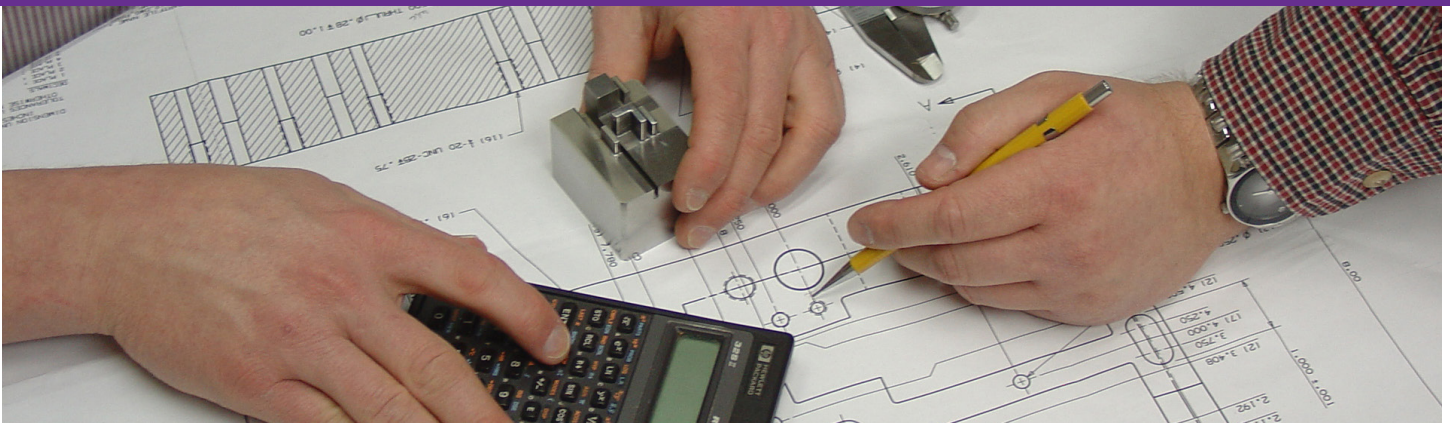
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Downloaded from: <http://pacareerstandards.com/manufacturing-careers-in-pa>

This student resource book highlighting careers in Pennsylvania manufacturing was created by Pennsylvania College of Technology and was funded by the Pennsylvania Department of Education, Bureau of Career and Technical Education under contract 093-14-4004.

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Any questions about this publication should be directed to Outreach for K-12, Pennsylvania College of Technology at 570-320-8003 or CareerEd@pct.edu.



Do What You Love, Love What You Do

Manufacturing Your Career in Pennsylvania

Facts About Manufacturing

America is a world leader in manufacturing. One in every ten workers in Pennsylvania works in manufacturing.

Men and women should consider manufacturing careers. Manufacturing offers many job opportunities that pay well.

The National Association of Manufacturers estimates that for every \$1.00 spent on a manufactured good, an “additional \$1.78 worth of economic activity” is generated. This is more than any other economic sector⁽¹⁾.

Manufacturing jobs also help increase jobs in other non-manufacturing areas. With strong manufacturing employers, communities have lots of good jobs for all families.

The sad part is that nine out of ten companies today can't get enough people that can do the job right.

People need specific skills and knowledge to be a successful employee in manufacturing.

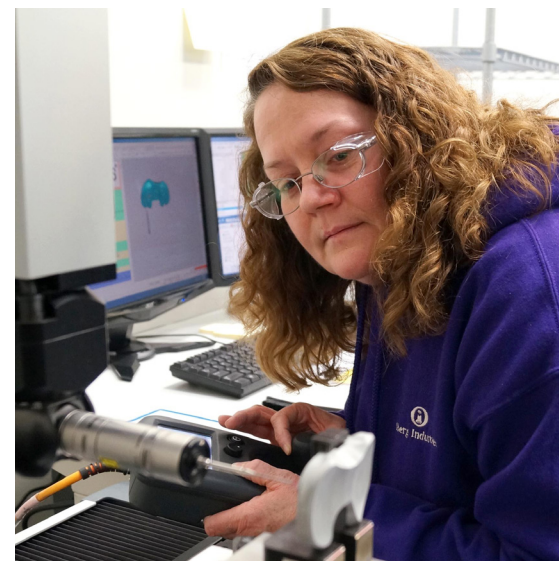
Many workers in manufacturing today are age forty-five years or older. This means many will retire in the next twenty years. Good paying careers in manufacturing will be available to people who can do the job.

Pennsylvania Manufacturing Fast Facts has the latest industry and job information. It is published every three months and can tell you which jobs and industries are showing job growth or decline. It is published by the Pennsylvania Department of Labor and Industry, Center for Workforce Information and Analysis. <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=1434259&mode=2>

Men and women in manufacturing careers report they find their careers rewarding. Manufacturing companies need employees with technical, professional and people skills and skills in English, math and science.

This guide will help you learn about exciting and innovative careers in manufacturing.

Maybe you will consider a career you've never imagined before.



(1) National Association of Manufacturers; www.nam.org/statedata.



What is Manufacturing?

Manufacturing is the process of taking raw materials and making them into a finished product. Manufacturers can make one copy of the finished product or many of them. Most often, machinery is used to create the finished product. You may also hear or see the term *fabrication* or *fabricated* to describe manufacturing.

Everything has gone through a manufacturing process from the toothpaste, comb or brush that you use in the morning, to the desk and notebooks you use at school.



Activity: *What items do you use every day that have been manufactured?*

It takes several steps to create the final product that a customer wants. For example, an automobile is manufactured. However, that process includes first making the many parts of the car and then assembling these parts into the final finished product. Each of these steps is part of the manufacturing process and the manufacturing industry.



Manufacturing is categorized by the type of raw materials used and by the type of product that is created. Different types of manufacturing in Pennsylvania include:

- Chemicals, rubber & plastics
- Electronics & semiconductors
- Metals
- Industrial machinery & equipment
- Vehicles & vehicle parts
- Wood & paper products
- Food & drink products
- Pharmaceuticals
- Clothing, leathers, textiles & fabrics
- Glass & porcelain products
- Factory-built housing
- Additive manufacturing
- Printing & publishing products
- Precision manufacturing

Click [Manufacturers' News](#) for more facts about manufacturing in Pennsylvania:

Leading Pennsylvania Industries by Employment:

- Industrial machinery and equipment
- Fabricated metal products
- Food and kindred products
- Chemicals and allied products
- Printing and publishing

Pennsylvania Cities with the Most Manufacturing Jobs:

- Philadelphia
- Pittsburgh
- York
- Lancaster
- Erie



Starting a Career in Manufacturing

Is manufacturing for me?

➔ **Manufacturing might appeal to you if you like to:**

- Figure out how things work
- Help people
- Solve problems
- Make things - especially using technology, electronics, lasers and robots
- Work with numbers
- Create new products and new ways to make those products
- Take things apart and put them back together
- Work on a team
- Use math and science



Listed below are skills and characteristics that will help you succeed in manufacturing.

- Learn quickly and communicate effectively – both speaking and in writing
- Work well with technology
- Desire to learn new skills/technologies
- Strong math, science and problem-solving skills
- Cooperate and communicate as a member of a team
- Take skills from one project and use them to do another project
- Display professionalism: arrive on time, display a positive attitude and choose the right work clothes
- Work well with all kinds of people

Have You Ever Imagined Yourself in Manufacturing?

The **Pennsylvania Career Zone** will help you explore a variety of occupations in manufacturing companies.

Go to www.pacareerzone.org and complete the interest profiler and the skills profiler. Follow these steps:

- Go to www.pacareerzone.org (to find manufacturing, select *Production* in the Job Family)
- Log in or create a login and password (*your information is safe – by having a login your work is saved and you can use it again and again*)
- Under “Assess Yourself,” click on “Begin Assessment”
- For the best help on jobs for you, complete all three assessments
 - Interest Profiler
 - Skills Profiler
 - Work Importance Profiler
- After you complete each section, view “Occupations.” Occupations that fit you best are listed. Many will be available within manufacturing companies.

Once you have completed these assessments, you can see a summary of the occupations that are right for you by going to the top of the page, click on “Grow,” then click on “Portfolio Summary Report.” Occupations are listed that meet the interests which fit you best (as determined by the three assessments you completed about yourself).



Career Profile Feature: Philip Wiegand



Since 1992, The Rodon Group, a subsidiary of K’NEX Brands, L.P., has manufactured over 34 billion parts for the K’NEX building toy system.

Have You Ever Imagined Yourself in Manufacturing?

The ***Pennsylvania Statewide Career Coach*** is a way to look at open jobs and wages in manufacturing (by Zip Code). Follow these steps to search manufacturing careers:

- Visit www.pacareercoach.org
- Fill in your first name in the text box
- Find your Zip Code on the list
- If you want to search an area larger than 5 miles from your Zip Code, click on the “up to 5 miles away from [Zip Code]” and increase the miles to a larger number
- Press Go
- Check the box for Manufacturing Job (MFG)

Click on the occupation of interest to see wage and employment trends for that occupation in Pennsylvania. Colleges that offer degrees in that area are listed along with currently open jobs in manufacturing.

While it will be a few years before you will be old enough to apply for these jobs, you can see real jobs that are now open and begin to understand the range of opportunities that can be available to you.



Oberg Industries, Inc.



Ralph S. Alberts Company, Inc.



Have You Ever Imagined Yourself in Manufacturing?

Students Occupationally and Academically Ready is the Pennsylvania Career and Technical Education's (CTE) Program of Study where you can begin your path to a career in manufacturing. Talk to your school counselor about visiting your district's career and technology center.



Some Pennsylvania CTE programs and dual enrollment programs give you the chance to earn free college credits.

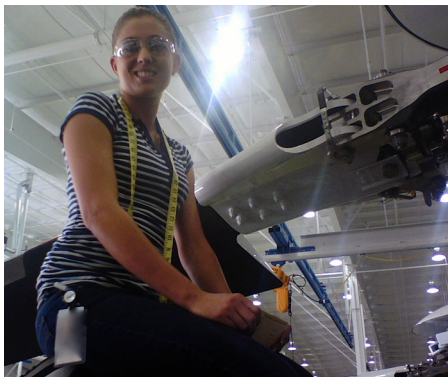


Check out SOAR opportunities:

http://www.education.state.pa.us/portal/server.pt/community/programs_of_study/7686

For colleges that award SOAR credit:

<http://www.collegetransfer.net/Default.aspx?tabid=943&from=4067>



*Career Profile Feature:
Nadine Trombley*

*Career Profile
Feature:
Alix James*



*Career Profile Feature:
Elizabeth Martens*



Career Profile Feature: Philip Wiegand

Melissa Doyle, President and Owner

Eagle Design Group – Chester Springs, PA

www.eagledesigngroup.com

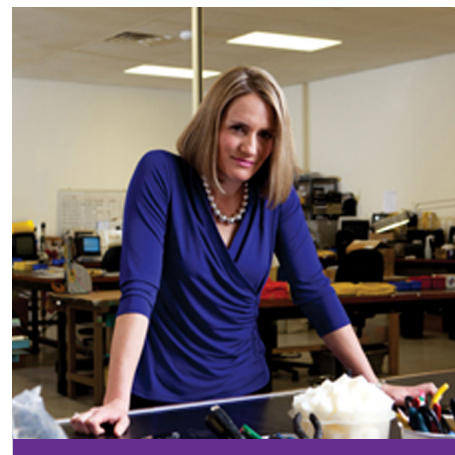
Her story: Melissa served in the United States Marine Corp (USMC) for 8 years. She left the USMC when she started a family and began working some part-time marketing jobs. Her family owned Eagle Design Group since 1986. In December 2012, Melissa purchased the company.

Melissa's current focus is strategy and growth for the company. She says her choice to pursue a bachelor's of science degree in mechanical engineering enabled her to become president of the company. She was featured in an article by the National Veteran-Owned Business Association, <http://www.navoba.com/article/as-a-matter-of-fact>.

Her spark: Melissa is interested in manufacturing processes that make everyday products she uses (clothes, bags and household items). She likes to problem-solve and work with her hands. She looks at how she can "make something better." She was interested in cars and wanted to be an automotive engineer as a teen.

Her education path: Melissa planned to get an automotive engineering degree. She attended a summer program at the Naval Academy while in high school. This inspired her to go to the Naval Academy for college. She took mechanical engineering because it was the closest degree to automotive engineering at the Naval Academy. She liked courses on thermodynamics and materials. She says the degree was hard, but she kept focused on graduation. "I knew I would be glad to have an engineering degree." She also earned a master's of arts degree in National Security Studies from Johns Hopkins University.

Her words of wisdom for you: Melissa encourages you to pursue a degree in engineering. An engineering degree will open up a wide range of opportunities. You can follow an engineering or a non-engineering career, but a non-engineering degree will not give you as much opportunity to pursue a career in engineering.



About her company:

Eagle Design Group is located in Chester Springs, PA. It is a small company that makes components for data processing and telecommunications. Some customers contract the company to make specific products. Other customers need the company to help them turn an idea into a product to sell. This takes research, development, innovation and marketing – all things that are exciting for Melissa. "Doing and being good isn't just a business method for Eagle Design Group, it's a life value. All of our employees are conscientious contributors and stewards of leadership and good faith in the local community," says Melissa.

Type of manufacturing:

Electronics & semi-conductors

PA Career Zone Occupations linked to this profile or this company:

Marketing Manager

<http://www.pacareerzone.org/profile/11-2021.00>

Manufacturing Engineers

<http://www.pacareerzone.org/profile/17-2199.04>

Why should I consider a career in manufacturing?

- *I can make this better.*
- *I can do what I love and love what I do.*
- *Various work schedules means I may be able to work around family obligations.*

Gerry Pena, Fiberglass Department Lead

Ralph S. Alberts Company, Inc. – Montoursville, PA

www.rsalberts.com

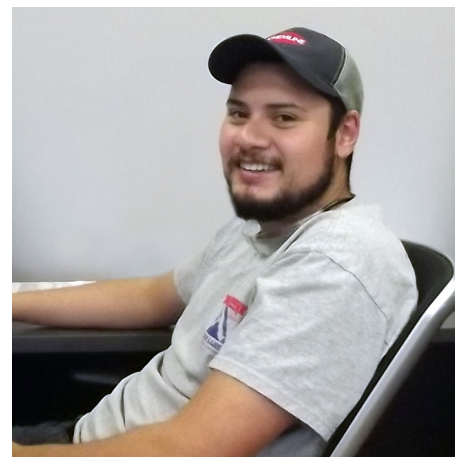
His story: Gerry grew up near Gettysburg, PA. He graduated from Pennsylvania College of Technology in 2011 and started working at McClarin Plastics in Hanover. He began as a summer intern at the company and was hired full-time when he graduated. He worked in the materials testing and development department, specifically with composite and thermoset resins. He enjoyed this work in composites. He worked with customers to understand what kind of product was needed and what kind of composite materials would accomplish the goal. He would also determine what kind of process would be used to manufacture the product.

When Gerry got married, he moved and started at Ralph S. Alberts Company, Inc. in Montoursville. He works in the Fiberglass department and his job is to ensure production orders are completed and delivered on time. When an order is received, he decides who will complete the job and what kind of fibers or glass laminate to use to accomplish the end-use requirements. He enjoys learning about different materials. Because the company focuses on small volume (low production) runs, every day presents a different product with new challenges and learning.

His spark: Outside of work, Gerry likes to play ultimate Frisbee, ride his mountain bike, and play with his dogs.

His education path: Gerry applied to Pennsylvania College of Technology after attending a College Open House. He started in the electronics engineering program, but changed his major to the bachelor's degree in Plastics and Polymer Engineering Technology during his second semester on campus. He made this decision when some friends in plastics toured him through the injection molding lab. A machine was making flying discs, the essential tool in his favorite past-time, ultimate Frisbee. He was featured in a campus article about students in the plastics program and the ultimate Frisbee team, The Free Radicals: <http://www.pct.edu/oca/articles/11summer/freeRadicals.htm>.

His words of wisdom for you: Gerry encourages you to consider a career in manufacturing because, "You can actually see something being made! You have results, especially if you like building things and being able to look at something that you've made or helped to make."



About his company:

Ralph S. Alberts Company is a small manufacturing company owned by the Alberts family. The owner treats everyone like family and brings in snacks or lunch for the employees. This company values the employees. The current owner, Edward has worked in the business since he graduated from high school (the company was started by his father). The company manufactures custom molding for different industries, especially medical simulators (molding plastic body parts). A large part of the business is the annual re-foaming of the safety padding for amusement park ride seats and pads.

Type of manufacturing:

Chemicals, rubber & plastics



PA Career Zone Occupations linked to this profile or this company:

Manufacturing Engineering Technologists

<http://www.pacareerzone.org/profile/17-3029.06>

Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers

<http://www.pacareerzone.org/profile/51-6091.00>

Renee Eaton, Chief Executive Officer

RapidMade – Global Company

www.rapidmade.com

Her story: Renee grew up around manufacturing. Her parents owned a small factory that made boxes for consumer goods (pizzas, bakeries, etc.). While working for her family, she learned that she enjoyed being a supervisor. She entered a management training program at the Nabisco Foods plant in Pittsburgh. She spent 2 years at this plant and then moved to a higher position in Philadelphia. When she returned to Pittsburgh, she worked as a supervisor in Packaging and Training and became the first female Baking Manager in Pittsburgh and afterward the second Manufacturing Manager in the division. Senior managers were traditionally male so she opened doors for women at Nabisco Foods.

Renee's career with Nabisco ended when the plant closed. She and her husband moved to Oregon where she taught management classes at a local university for 8 years. Her family then moved to England for a year, and while there she learned about additive manufacturing, or 3D printing. This passion brought her back to the United States to start RapidMade. She now runs the operations for the Oregon-based business and lives south of York, PA.

Her spark: Renee finds passion in manufacturing. She loves to develop new ideas and innovate existing products. She likes to supervise and provide guidance to improve how products and processes are produced.

Her education path: Initially, Renee wanted to do human services work. She graduated with a liberal arts bachelor's degree but couldn't find a job that paid enough money to support herself. This led her to work for her family. Later, while in Pittsburgh, working full-time at Nabisco, she enrolled part-time in a business administration program and earned her MBA.

Her words of wisdom for you: Renee wants you to know there is so much opportunity for women in manufacturing. Women bring many unique skills to manufacturing. These skills help the industry and are rewarding. Women see different options to address challenges and build better teams. This is an important part of inventing new products and improving organizations. She says, "Women bring smarts and people skills. Don't limit yourself before you even try!"

PA Career Zone Occupations linked to this profile or this company:

Accountants

<http://www.pacareerzone.org/profile/13-2011-01>

Chief Executive

<http://www.pacareerzone.org/profile/11-1011.00>



About her company:

RapidMade 3D prints products for customers. The company has printed prosthetic hands for people. Other services include rapid prototyping, reverse engineering, pattern and tool making, product design and 3D modeling.

Type of manufacturing:

Additive manufacturing

RAPID
made™

Why should I consider a career in manufacturing?

- I can make more money than in many other careers.
- I can create new products.
- I can work with people on teams.



Why Me in Manufacturing?

Manufacturing companies employ individuals in all kinds of occupations. Examples include operators, accountants, managers, engineers, technicians, technologists, sales and marketing and even occupational nurses. No matter what your career interests are, there are manufacturing companies in Pennsylvania where you could work.

Manufacturing companies have jobs available with great salaries. Not enough people have the necessary skills to do the work. This opens the door of opportunity for you to get a job you really like.

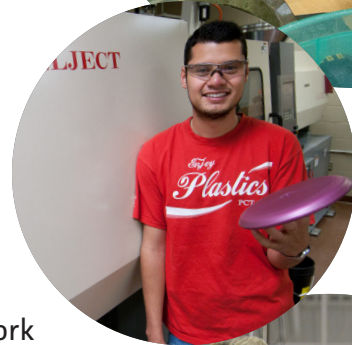
The industry needs you. In manufacturing, you can make a difference in the world around you.

Women are important to manufacturing because⁽²⁾:

- 1) They make companies more competitive.
- 2) They bring different experiences and insights.
- 3) Companies' customers want diversity.
- 4) Women in leadership make companies more profitable.

Here are reasons why individuals in manufacturing say they are glad to work in this field:

- The pay is better.
- The work gives me challenging assignments that help me learn.
- The industry and jobs are global so I can work anywhere.
- The more I learn the more job security I have.
- Technology is advanced and fast moving.
- I have career advancement opportunities.
- It is an exciting industry.
- I may be able to work at a household name company.
- The industry values innovation and gives me the chance to be creative.



(2) *Untapped Resource: How Manufacturers can Attract, Retain, and Advance Talented Women*. Deloitte and the Manufacturing Institute (2013): http://www.themanufacturinginstitute.org/~/_media/D3465FEDBBAA42CAA694EE6002AF8A90/Women_in_Manufacturing_2013.pdf.

Carol E. Spencer, International Customer Service

Oberg Industries – Freeport, PA

www.oberg.com

Her story: Carol has worked at Oberg Industries for over 40 years. She loves it and has always enjoyed her jobs. She did not plan to get into manufacturing as a career. She started at Oberg as a receptionist and moved up in administrative-support roles. She currently works in the international customer service department and reports to the Director of International Container Cooling.

The container business is a booming market. Different countries and cultures approach containers differently. The company makes equipment used for a variety of containers with different materials, thicknesses, colors, and more. Hence, Carol does a lot of problem-solving for customers. She helps them find products to meet their needs. She also learned a lot about different products and how they are made.

Her spark: Carol sees so many opportunities in manufacturing. She wishes students would take more advantage of them. She is amazed at what is manufactured. “Most of the items you touch everyday have been manufactured in some way,” says Carol.

Carol looks at products and thinks about what kind of manufacturing it took to make that item. Manufacturing never ceases to amaze her. She calls herself a “thinker” and loves that she plays a role in a product that can help make a difference in the lives of people all over the world.

Her words of wisdom for you: “Don’t be afraid to try something new. You never know what you will learn when you simply try. Talk to your school counselor about a tour of a local manufacturing facility. Look beyond the products you use every day and think, how did that get here? Keep an open mind because there are so many more careers in manufacturing than you ever imagined.”

Carol wants you to know that manufacturing is an environment that can be clean, fun and engaging every day.



PA Career Zone Occupations linked to this profile or this company:

Computer Numerically Controlled Machine Tool Programmers,
Metal and Plastic

<http://www.pacareerzone.org/profile/51-4012.00>

Electronics Engineering Technicians

<http://www.pacareerzone.org/profile/17-3023.01>



About her company:

Oberg’s corporate facility is in Freeport, PA. The company was founded in 1948. Oberg is a solid company with a long history in manufacturing, specifically precision metal stamping, tooling, high precision machining and automation/assembly. The company was started by Donald E. Oberg. The company’s focus is innovation and precision.

Type of manufacturing:
Precision manufacturing



Oberg Career Video:

<https://www.youtube.com/watch?v=dmxU42gnwG0>

Why should I consider a career in manufacturing?

- I can solve problems.
- I can move up in the company.

Jon Schall, Director of Controls Engineering

First Quality Products, Inc. – McElhattan, PA

www.firstquality.com

His story: Jon and his family live in McElhattan, PA and he works at First Quality Products, Inc. In high school, he took a Nuclear Science class and realized that he enjoyed working with technology like lasers. His teacher recommended he pursue electrical engineering in college. Jon worked at C-Core Electronics and then at Bailey Controls Company. Both companies were circuit board manufacturers in central Pennsylvania. From there he went to another company where he did design work for government-funded projects.

Jon started at First Quality Products, Inc. as a technician in 1999. He moved into a leadership role and then to engineering. He continued upward into management and is currently the Director of Controls Engineering. Jon works with automation, electronics and programming in all of the divisions at the McElhattan facility. He is also part of the business development of new products and projects.

Jon's favorite quality about his chosen career is that he "...is very marketable. Even if my current job environment became unstable, I have no question that I could get a job anywhere. It's great to work in an industry that continually experiences growth."

His education path: Jon graduated from Pennsylvania College of Technology with an associate of applied science Electronics degree (robotics emphasis) in 1993. While working full-time, he returned to finish a bachelor's of science degree in Electronics & Computer Engineering Technology: Robotics & Automation Emphasis, and graduated in 1999. He earned his master's degree in business from the University of Phoenix in 2003. "I encourage every student to find companies that will pay for further education," says Jon.

His spark: Jon loves that manufacturing is an ever-changing environment and sees so much potential in the industry. "Manufacturing in the US is growing rapidly with strong job stability! The trends are changing and manufacturing is coming back to the US."

His words of wisdom for you: "If you have an interest in a technical field, go into manufacturing. Find something that you love to do and focus on it. The money will come as a result of being good at what you do."



About his company:

First Quality is a family-owned network of companies. Employees are treated as family members. The company makes consumer goods for the retail and institutional markets, such as baby and adult diapers, personal hygiene, paper towels, toilet paper and bottled water, as well as non-woven raw materials for other industries. The company is vertically integrated which means many of the materials needed for the manufacturing processes are made by the company.

Type of manufacturing:

Chemicals, rubber & plastics



Why should I consider a career in manufacturing?

- It's fun.
- I get to work with technology and really cool equipment.

PA Career Zone Occupations linked to this profile or this company:

Extruding and Drawing Machine Setters, Operators, and Tenders

<http://www.pacareerzone.org/profile/51-4021.00>

Electrical Engineering Technicians

<http://www.pacareerzone.org/profile/17-3023.03>

Elizabeth Martens, Process Engineer

Actuant Corporation – Global Company

www.actuant.com

Her story: Elizabeth grew up outside of Hughesville, PA. In college, she was recruited for the Actuant Management Development Program. She worked in many facilities doing different jobs. She went to St. Louis, MO in new product design for high voltage products. She spent time in West Bend, WI and Binghamton, NY in Engineered Solutions where she was a process engineer for supplier changes. Finally, she worked for Maximatecc, headquartered in Lancaster, PA, spending most of her time in the Juarez, Mexico facility.

Elizabeth is a process engineer. Her focus is continuous improvement for the company. She does this by working in different business units to understand how they function. She brings concepts of Lean Manufacturing and the Toyota Production System to the business units. She seeks ways to improve how these units work and to save the company money. Her goal is to move up in the company to be a Continuous Improvement Leader or Continuous Improvement Coordinator.

Her spark: Elizabeth enjoyed math and science in school – specifically physics and calculus. She is passionate about manufacturing because she sees it as “physically creating value.” What she loves about continuous improvement is that “you create value more efficiently.” Elizabeth says, “You take things from worthless and turn them into machines that create new products for people. Very few other people in other professions physically create value.” Elizabeth also loves the global aspect of manufacturing – she has worked all over the United States and Mexico.

Her education path: Elizabeth went to college at the University of Rochester (New York) majoring in mechanical engineering. She also took music theory and played varsity soccer.

Her words of wisdom for you: “Manufacturing has jobs that give you the chance to play with different toys and be very hands-on. It’s not just building things - you’re designing, building and working with your hands and doing. You can wear jeans and t-shirts and get involved in projects (sometimes getting your hands dirty and other times creating things). Few jobs give you the chance to think of an idea and then physically create products, parts, things or whatever you need to fix a problem and find a solution. You see an immediate impact right away.”

PA Career Zone Occupations linked to this profile or this company:

Computer-Controlled Machine Tool Operators, Metal and Plastic

<http://www.pacareerzone.org/profile/51-4011.00>

Electromechanical Engineering Technologists

<http://www.pacareerzone.org/profile/17-3029.03>



About her company:

Actuant Corporation is a global company with many divisions and segments. The primary segments of Actuant are Industrial, Engineering Solutions and Energy. The divisions within each of those segments are headquartered all over the world including Lancaster, PA.

Type of manufacturing:

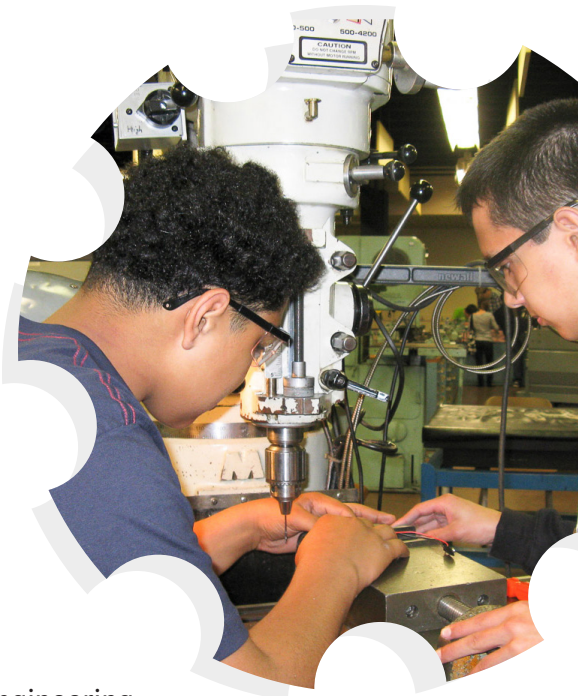
Diverse manufacturing to include electronics and metals

Why should I consider a career in manufacturing?

- *I can travel around the world.*
- *There are great benefits - including retirement and health insurance.*
- *I can use my skills in science, technology, engineering or math.*

Manufacturing Soft Skills (or People Skills)

- **Critical thinking:** The ability to problem-solve using scientific literacy, and to analyze, interpret and present information is important in everyday manufacturing environments.
- **Negotiations:** Good workplace relationships are important.
- **Detail-oriented:** This is important in today's manufacturing environment.
- **Team players:** Leadership skills are used to collaborate and bring teams together.
- **Global awareness:** This includes multicultural literacy, humanitarianism, civic, ethical, social-justice literacy and environmental conservation.
- **Multi-tasking:** Managing many different priorities is a skill prized in today's manufacturing.
- **Organized:** It is important to organize responsibilities and time.
- **Diverse approach:** Creative and different approaches are important to engineering and innovation.
- **Positive attitude & enthusiasm:** A learning mindset and positive attitude is necessary in the workplace.
- **Professional networking:** This means to take initiative, meet new people, use social networks, texts and email to increase the number of potential customers and partners.
- **Professionalism:** This is not one skill, but the blending and integration of a variety of skills.
- **Mentoring:** A mentor is an experienced and trusted advisor. It is important to help new employees by mentoring them.
- **Self-motivated:** Perseverance, self-direction, planning, self-discipline, adaptability and initiative will help you achieve your goals. Some careers are based in a home office and not in a conventional facility office.
- **Innovation:** Use creativity, artistry, curiosity, imagination and personal expression to create new ideas, products and processes.
- **Communication:** Oral and written communication, public speaking, presenting and listening to what people say are important.
- **Technology literacy:** This is defined as information and communication technology (ITC) literacy, media and internet literacy, visual interpretation, data interpretation and analysis and computer programming.
- **Personal health and wellness:** Health and wellness literacy, including nutrition, diet, exercise and public health and safety are important to be a successful professional in manufacturing.
- **Entrepreneurialism:** Economic and financial literacy help in innovation and continuous improvement.



Activity:

Click to read the case study of how one diverse team of engineers drove innovation in manufacturing. The innovative family-friendly 1999 Ford Windstar had 50 female engineers on the team.

<http://usatoday30.usatoday.com/money/consumer/autos/mauto578.htm>

Directions: Pick one or two Manufacturing Soft Skills and describe how you see them reflected by this team of people.

Nadine Trombley, ACE Pilot

Sikorsky Global Helicopters – Coatesville, PA

www.sikorsky.com

Her story: Nadine started in manufacturing in 2007. Her father worked at Sikorsky Global Helicopters and invited her for a tour. After she toured the upholstery department, she applied and got a job as an upholstery technician. In this job, she fabricated and sewed interiors for utility and search and rescue helicopters.

Nadine moved up in the company and her current job responsibilities focus on continuous improvement supporting manufacturing. She loves that she gets to interact with every part of the process – design engineering, fabrication, assembly, quality control and customer service. She sees everything come into the plant (in boxes and crates) and then gets to see the completed aircraft fly away.

As Nadine reflects on her career so far, she is glad that she started as a technician. It helps her understand the job that technicians have so she can work to improve their job by creating a more efficient and safe working environment.

Her spark: Nadine thrives in problem-solving and making products and processes better. She loves to sew. She made a lot of her own clothes and accessories in high school. She is able to turn her passion into her career. She also likes to refinish furniture in a wood shop. She takes old furniture and makes it her own. She serves as a mentor to help young girls learn about manufacturing careers. She believes she can relate to youth and encourage them to get into manufacturing. Her hobbies include fishing, paintball and rock climbing.

Her education path: Nadine earned her associate's degree in behavioral science. She earned her bachelor's degree in Business Management: Organizational Leadership and Development from Widener University. She also completed a Project Management graduate certificate from Boston University. She is certified as a Scrum Master. Scrum is an agile methodology for continuous improvement – taking many approaches to making processes better. She worked full-time during her schooling (for 11 years) and looks forward to the opportunities that may open for her in the future.

Her words of wisdom for you: Nadine wants to tell you: “Don’t be afraid!” She believes that if a girl wants to do something, she should go and do it. “Girls bring so much to manufacturing, and they can do the jobs and enjoy them,” Nadine says.



About her company:

Sikorsky Global Helicopters in Coatesville, PA manufactures commercial aircraft.

Type of manufacturing:

Diverse manufacturing to include textile & fabrics and vehicles (aircraft)

PA Career Zone Occupations linked to this profile or this company:

Aircraft Structure, Surfaces, Rigging, and Systems Assemblers

<http://www.pacareerzone.org/profile/51-2011.00>

Fabric and Apparel Patternmakers

<http://www.pacareerzone.org/profile/51-6092.00>

Why should I consider a career in manufacturing?

- I can work for high-tech companies.
- I can work with products I love.

Philip Wiegand, Fabrication Manufacturing Engineering Manager

Volvo Construction Equipment – Shippensburg, PA

www.VolvoCE.com/na

His story: Philip started at Lancaster County Career & Technology Center’s welding program during his senior year of high school. Before he got into welding at the CTC, he wasn’t sure he wanted to go to college, but his success proved to him that he should try college. He enrolled at Pennsylvania College of Technology in the Welding Technology associate’s program. As he finished his second year, he was encouraged to stay at the college to finish his bachelor’s degree (Welding & Fabrication Engineering Technology). He wasn’t sure he had the skills to succeed in the 4-year program, but with some outstanding mentors who supported him, and a lot of hard work and dedication, he graduated with his bachelor’s degree in 2004.

Philip started working for Ingersoll-Rand as a Weld Engineer the Monday after he graduated. The company was bought by Volvo Construction Equipment in 2007. Philip remains at the same location but his job has changed since the purchase.

Philip is a Fabrication Manufacturing Engineering Manager for Volvo Construction Equipment. He works with a team of weld and manufacturing engineers to install new welding, machining and painting equipment to improve manufacturing efficiency and productivity. He helps with new equipment cost analysis, purchasing, installation and start-up. He also works with a design team on new product development projects. This team works to design products to be easily and efficiently manufactured to help reduce production costs.

Philip’s favorite part of the job is that he gets “to see ideas for new construction equipment in the early stages, have input into new concepts, see the concepts formed into prototype machines, and then see the new machine go into production while making a positive impact on the manufacturing floor. I see tangible results. I can take an idea, watch it come together in a solid plan and see that plan implemented for real results.”

His spark: Philip enjoys spending time with his family and racing off-road motorcycles (enduro racing).

His words of wisdom for you: “Most manufacturing in the US no longer takes place in dirty or unsafe environments. The jobs in manufacturing are awesome and something that you really need to consider. Be open minded about manufacturing opportunities and look at the great jobs available!”



About his company:

This Volvo Construction Equipment plant primarily manufactures road construction machinery that is used to build and maintain roads. The Shippensburg facility manufactures seven product lines, including soil and asphalt compactors which compact soil and stones for the road base and compact new pavement once it’s been laid. The most recent product line is the wheel loader products that are used throughout general construction. Volvo is working to change the whole environment around manufacturing. Philip says that, “Many visitors are amazed at how clean, well lit, and environmentally friendly our facility is. They are especially impressed by this in the fabrication area where I work.”

Type of manufacturing:

Industrial machinery & equipment

VOLVO

Volvo Construction Equipment

PA Career Zone Occupations linked to this profile or this company:

Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders

<http://www.pacareerzone.org/profile/51-4122.00>

Electrical Engineering Technologists

<http://www.pacareerzone.org/profile/17-3029.02>

Alix James, Chief Executive Officer

Nielsen-Kellerman – Boothwyn, PA

www.nkhome.com

Her story: Alix has worked for Nielsen-Kellerman for over 22 years. She began working at the company part-time in marketing and advertising. After 5 years, she was hired full-time and ran the Customer Service Department. Her position grew into a more operational role, specific to logistics and materials. As she moved up in the company, she ran sales and marketing and provided oversight in the Engineering Department. Approximately 12 years into her career, she learned Lean Manufacturing and process improvement. She applies the concepts of Lean Manufacturing to everything in the company. She describes herself as a problem-solver and team builder. She pursues collaboration and seeks to break down barriers to make things happen in the facility.

Her spark: Alix is pro-American manufacturing. She loves to “find elegant solutions to everyday problems.” She finds a lot of joy working with her team members and helping them grow, learn and get better at their jobs. She is passionate about her company because the products make a difference in the lives of people. She describes her employees as “a tremendous team of people.”

Alix also loves to be part of the full cycle of product development: coming up with product ideas, defining the product, designing the product, determining the price, building the tools to make the product, designing the electronic boards, buying other parts, assembling the product, marketing the product, selling, shipping and collecting the revenue for the product.

Her education path: Alix went to college to be a veterinarian. She changed half-way through to major in English and economics. She had no career plan. She went to Philadelphia for her hobby in rowing and decided to go to school to be a lawyer. She went to law school and worked in California as a lawyer for 3 years.

Her words of wisdom for you: Alix says that it is common for girls to want to work in something that is meaningful and worthwhile. She feels this sometimes drives girls to choose social work or non-profit work. However, her experience taught her that working in business does a tremendous amount of good. As the CEO, she is able to provide wages and healthcare that supports over 90 families. She also makes a difference for those families by providing her employees with great working conditions and a meaningful job.



About her company:

Nielsen-Kellerman started in the basement of Alix’s house in high school by her step-father. The company now makes electronic instruments for sports. These instruments measure variables such as speed, distance and stroke rate for competitive rowing. They also make hand-held instruments that measure environmental conditions such as wind speed, temperature and pressure. These instruments are used by construction workers, firefighters, storm chasers and agriculture workers.

Type of manufacturing:

Electronics & semiconductors

PA Career Zone Occupations linked to this profile or this company:

Human Resources Managers

<http://www.pacareerzone.org/profile/11-3121.00>

Electronics Engineering Technologists

<http://www.pacareerzone.org/profile/17-3029.04>

Why should I consider a career in manufacturing?

- I get to help people and make a difference.
- There are all kinds of jobs.

Career Advantages in Manufacturing

Below are some reasons you may like to work in manufacturing.
How many are important to you?

Move up the Career Ladder: Companies want workers to take on more management roles.

Flexibility: Manufacturing jobs can have flexible schedules. Employees prefer this when they want to work a nontraditional schedule and balance work and other passions (such as family or travel).

Lots of Different Job Responsibilities: Employees can do a lot of different things in manufacturing. This means you can learn different skills at all kind of jobs.

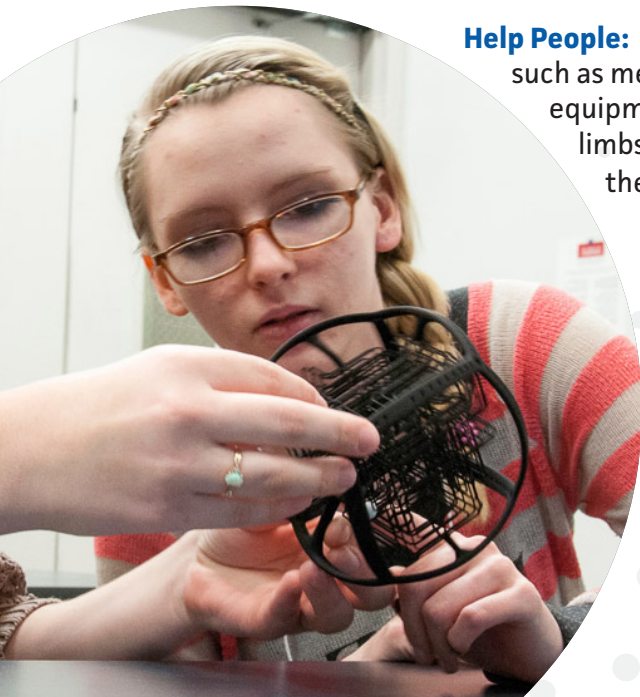
Something for Everyone (Variety of Careers): There are many different careers in manufacturing. Examples include marketing managers, accountants, computer-aided design (CAD) technicians, engineering technologists, scientists, design engineers and quality control specialists, to name a few. Some may need a college education. Others are great career options through high school Career and Technical Education programs.

Excellent Benefits: Many manufacturing companies offer great benefits such as tuition reimbursement, retirement plans, health plans, flexible work schedules and overtime.

High-Tech Environment: Manufacturing has cutting edge technology that can change the industry and the world. For example, additive manufacturing with 3D printers has revolutionized medical devices and prosthetics. Nanotechnology is changing the properties of products from making cloth more flame retardant to adding healing properties to bandages.

Clean Environment: Most companies have very clean working conditions. In the case of medical manufacturers, it is required by law. It can be so clean that you have to wear a big white suit to make sure nothing contaminates the products.

Help People: Companies produce products that directly help people such as medical devices, X-ray machines, smartphones, tablets and equipment used in research. Biomedical engineers design artificial limbs and machine operators mold and cut the pieces that make the limbs.



Amber Dougherty, Supervisor

Primus Technologies Corporation – Williamsport, PA

www.primus-tech.com

Her story: Amber didn't always see herself working in manufacturing. When she moved to Williamsport, she got involved in the local Community Theatre League. Because of this involvement, a person at the theatre league told her about an opening at Primus Technologies Corporation and she applied.

Amber began her career at Primus as a Stock Room Attendant. In this position, she counted parts when they came back from the manufacturing line. She described this as a general job, but she worked very hard. She learned everything she could about the job and the company. From there she moved to a Productions Planner position. In this position, she scheduled the materials and work cells to complete the products to meet the customers' delivery dates.

From there Amber moved to Supervisor, where she currently works. She supervises approximately 60 people. Her primary responsibilities include day-to-day problem solving and management. When the people can't figure out a solution to a problem, she assists in finding the best resolution.

Her spark: Amber loves that no day is ever the same at Primus. She is excited to be part of new projects and find solutions to problems that arise every day. She also loves that the products produced at Primus are used in military and consumer equipment. Outside of work, she loves to do photography and creative-arts activities.

Her education path: Amber started working right after high school. She worked in data entry in Ohio before she moved to Williamsport. She is working towards her associate's degree in Business Management at Pennsylvania College of Technology while at Primus. She plans to pursue her bachelor's degree when she's done.

Her words of wisdom for you: Never underestimate the power of hard work. "Hard work rarely goes unnoticed," says Amber. This is how she was able to move up in her career. She encourages you, "to keep that curiosity and love for learning. Kids are often more curious than adults and more open-minded to figure out problems. This trait can take you many places so always keep that desire to learn new things and an open-mindedness about how to solve problems!"

PA Career Zone Occupations linked to this profile or this company:

Industrial Production Managers

<http://www.pacareerzone.org/profile/11-3051.00>

Electronic Drafters

<http://www.pacareerzone.org/profile/17-3012.01>



About her company:

Primus is located in Williamsport, PA. The company makes electronics for mission-critical products in aerospace, defense, medical, industrial controls and other industries. Primus manufactures products for airplanes, helicopters, medical imaging, neonatal monitoring, air brakes for trains and hazardous materials detectors. Primus is a company that invests in current employees. This investment helps employees grow and develop to move up in their career and better contribute to the mission and goals of Primus. Amber described Primus as, "a company that really cares about the employees."

Type of manufacturing:

Electronics & semiconductors

Why should I consider a career in manufacturing?

- I can work after I graduate from high school and the company may pay for my college degree.
- I get to learn new things.

Jill Worth, Digital Marketing

The Rodon Group/K'NEX Brands, L.P. – Hatfield, PA

www.rodongroup.com

Her Story: Jill started her career in marketing and communications. She went to college for a Fine Arts bachelor's degree. After college, she worked in the marketing department for a company that created educational toys. She has spent much of her career doing marketing and communications, including content development, blogging and social media. In 2010 she got a job at The Rodon Group in marketing. This was her first time at a plastics manufacturing facility. She was always interested in how things were made, especially in marketing the value of the products and the privilege of working for a U.S. manufacturer.

When Jill started at The Rodon Group, the company did not have a marketing department and did very little digital marketing. She was to improve the marketing for the company and build a bigger online presence. She now manages the marketing department for the company and develops the marketing plans and initiatives. She played a key role in the creation of the free e-book called "An Introduction to Plastics Injection Molding" which can be downloaded from the company's website and blog <http://www.rodongroup.com>, <http://info.rodongroup.com/blog>.

Her words of wisdom for you: "There are many different types of opportunities available today in manufacturing. Recently, U.S. manufacturing has taken a positive turn and it's an ideal time for students who are interested in such things as design, tool making, engineering, robotics, marketing or other STEM related fields to consider a career in manufacturing. Learn more by connecting with companies that interest you on social media. Visit a factory and ask to take a tour; learn about the different careers people have at these facilities. It's a whole lot different than what it was fifty years ago! Today, it's all about innovation, technology and automation. Every day, we see new products come to life, but often don't realize all of the amazing processes, advanced technologies and high level of skills that went into making them. It's exciting to be a part of it every day."

THE RODON GROUP®



About her company:

The Rodon Group is a custom plastic injection molding company started in 1956 by Irving Glickman. It originally started as a rubber company in Philadelphia. As a family-owned business, The Rodon Group meets customer needs by designing a plastic part, developing the tooling needed and manufacturing the part. The Rodon Group serves a wide range of industries including consumer products, windows and doors, food and beverage, construction, pharmaceutical and toys. You may be more familiar with their sister company, K'NEX Brands, L.P. K'NEX was created by Joel Glickman in 1992 and has become one of the world's leading integrated toy manufacturer of construction systems for children.

Type of manufacturing:

Chemicals, rubber & plastics

PA Career Zone Occupations linked to this profile or this company:

Model Makers

<http://www.pacareerzone.org/profile/51-4061.00>

Market Research Analysts and Marketing Specialists

<http://www.pacareerzone.org/profile/13-1161.00>

Educational Pathways to Career Success in Manufacturing

How do I get there?

There are many career avenues to enter the world of manufacturing. Some pathways can be entered after high school or through apprenticeship programs. Other, more advanced pathways, require education beyond high school. All pathways require a working knowledge of mathematics, science and communication skills. Good teamwork skills are also essential. Developing a good foundation for these skills while in high school is important for success in any of the occupations shown in the career pathways.

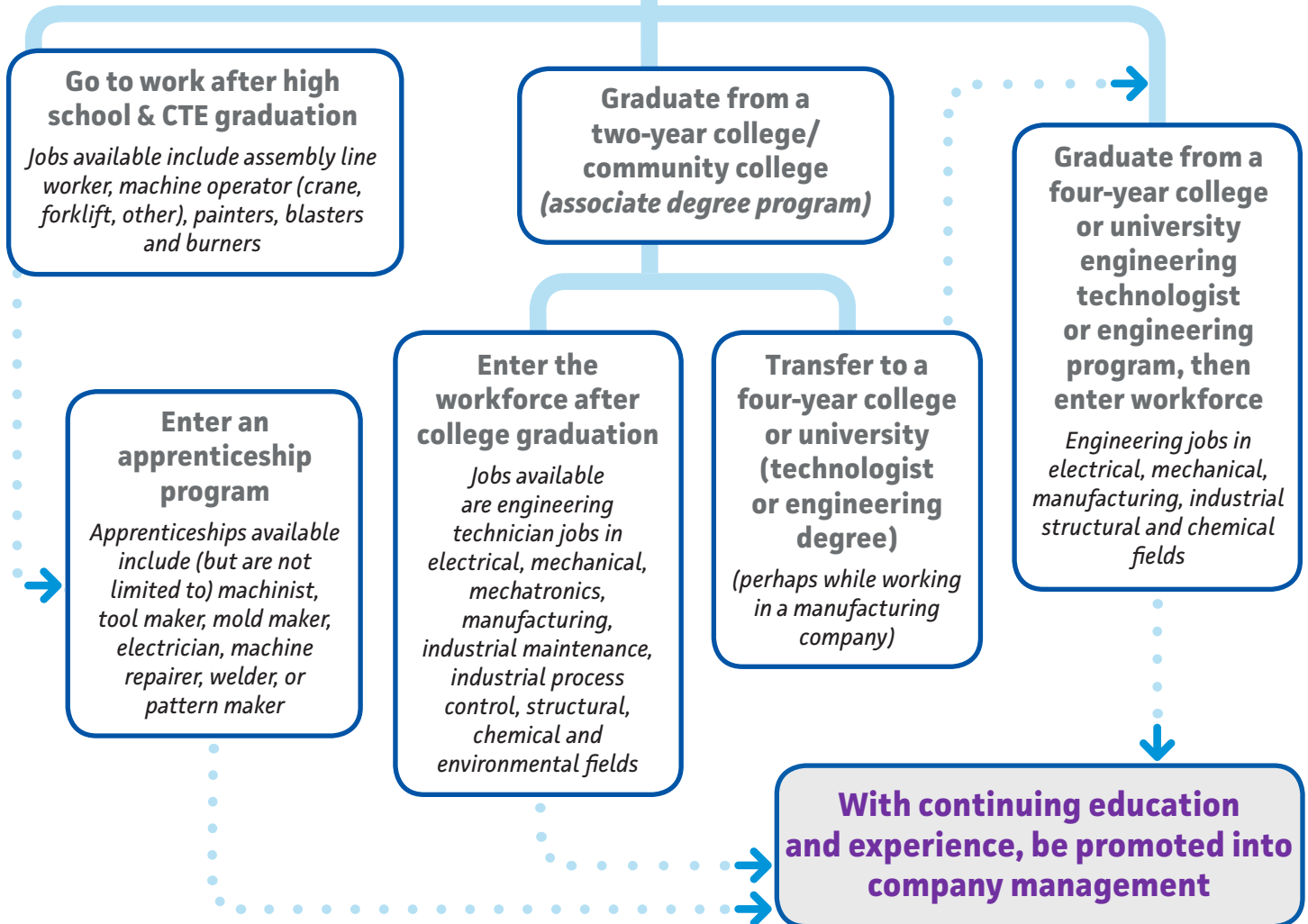
Prepare in Middle School

Take your classes seriously and do your best work. Explore your interests and talents and use the resources provided by your school counselors to begin your career journey and make smart choices in high school.

Graduate from High School

In high school, sign up for career and technical education or other technical courses. Make sure to take courses such as geometry, algebra, trigonometry, physics, and chemistry. Almost all jobs require you to continue to learn after you leave high school or college.

Don't forget to check out what college credits you can earn in high school through dual enrollment or career and technical education (SOAR).



Example Career Pathways in Manufacturing

Where can I go?

Morgan Corporation, Morgantown, PA www.morgancorp.com

Morgan Corporation is part of the parent company J.B. Poindexter & Co., Inc. and is one of the leading manufacturers in the U.S. for class 3 – class 7 truck bodies. The corporate office is located in Morgantown, PA, along with the Morgantown plant that does over 1/3 of the company's business. There are an additional nine manufacturing plants throughout the U.S. and one in Canada along with five company operated service centers. The company has sales of \$450 million.

The company's strength lies in the belief that extraordinary results come from empowering team members. They represent the source of competitive advantage through diverse backgrounds, experience and skills.

The leadership at Morgan Corporation believes in providing each team member the opportunity for the full development of their skills and abilities in an environment of open communication, mutual trust and respect. They established training centers across the manufacturing facilities. They create opportunity for career development by having team members complete self-interest forms and work with their supervisor and the local human resources department. Together they all develop plans based on individual interest, and establish career paths that will be rewarding to team members and ignite company growth and success.

The company takes pride in the career opportunities for team members. This means there are a lot of opportunities for advancement within the company. Many higher level team members have been promoted from within the company. The company has a culture of investing in current team members to develop skills and talents.

The following illustrate some of the ways that you can grow your career within Morgan Corporation. These examples are not unique to Morgan Corporation but are potential career paths that can be followed at many manufacturing companies.

Career path 1:

Manufacturing floor production associate 1 ▶ production associate 2 ▶ welder 1 ▶ welder 2 ▶ welder 3 ▶ team lead ▶ line lead ▶ production supervisor

Career path 2:

Manufacturing floor production associate 1 ▶ production associate 2 ▶ painter 1 ▶ painter 2 ▶ team lead ▶ line lead ▶ production supervisor

Career path 3:

Manufacturing floor production associate 1 ▶ material handler 1 ▶ material handler 2 ▶ team lead ▶ buyer/planner ▶ scheduler ▶ buyer/planner specialist ▶ scheduler specialist ▶ material manager

Career path 4:

Production Supervisor ▶ production manager ▶ plant manager ▶ director of operations

Career path 5:

Production associate 3 ▶ technical sales representative ▶ regional sales manager ▶ director sales manager

These are a sampling of the many career paths that a team member could move into through the career progression with the company. The pace and timing depend on the individual's desire and ability to demonstrate proficiency in each position as they move in their career.

Example Career Pathways in Manufacturing

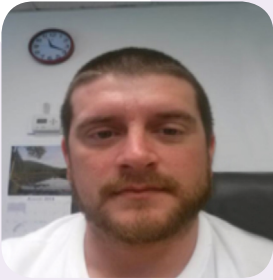
Where can I go?

Morgan Corporation, Morgantown, PA

www.morgancorp.com

What Have They Followed?

To further demonstrate the internal opportunities, the following stories are just a snippet of some recent career paths of existing team members.



Brandon Waldon
Service Center Supervisor

Brandon started his career with Morgan Corporations in the Rydal, GA plant 11 years ago as a production associate 1 ▶ production associate 2 ▶ production associate 3 ▶ team lead ▶ service center supervisor in Denver, CO.



Eric Marlow
Production Supervisor

Eric joined the company three years ago as a maintenance tech 1 ▶ maintenance tech 2 ▶ production supervisor.

Why should I consider a career in manufacturing?

- *I can work with a global company that is headquartered in Pennsylvania.*
- *There are lots of places to work and lots of jobs.*
- *I can work by myself.*
- *I can work in a team.*



Jerry House
Service Center Supervisor

Jerry started his career with Morgan Corporation 11 years ago as a production associate 1 ▶ production associate 2 ▶ production associate 3 ▶ team lead ▶ temporary supervisor in TX ▶ production supervisor in GA ▶ scheduler in the materials department in Rydal, GA.

Student Name: _____

Student Exercise: PERSONAL REFLECTIONS

List five careers that match your interest and abilities and why:

Careers

Why

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

List two different career training programs and their related employment possibilities:

List three manufacturing careers in demand where you live (within 30 miles of your hometown):

List three workplace skills and/or soft skills you need in a manufacturing career:

PA Core Standards

Aligned English Language Arts Non-fiction Activities

PSSA Evidence-Based Response Type Questions

What Is Manufacturing? (Page 2)

- 1) In the first paragraph, the word “fabrication” is introduced. Using details from the paragraph, define the meaning of this word.
- 2) Why do you think that the author included the information from paragraph 3? Cite details from the text in your explanation.
- 3) Try to name at least one product that you own for each of the categories of types of manufacturing in Pennsylvania.
- 4) Which of the products that you listed do you think would use the greatest number of different types of raw materials? Explain your answer in a paragraph, drawing from information in the text.

Standards Addressed

CC.1.2.8.A, B & K

Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text. Cite the textual evidence that most strongly supports an analysis of what the text says explicitly, as well as inferences, conclusions, and/or generalizations drawn from the text. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools.

PSSA Text-Dependent Analysis Type Questions

Text-Dependent Analysis #1

Citing one or more Career Profiles and additional facts about manufacturing presented in this booklet, write an essay analyzing why a person should consider a job in the manufacturing industry.

Text-Dependent Analysis #2

Choose 2 different Career Profiles and analyze the similarities and differences found in their career journeys in a well-developed essay.

PSSA Writing Prompt Type Question: Informative/Explanatory

Your school is hosting a career awareness week. Write an essay explaining what students can do in middle school to help them choose and prepare for a career later in life. Be sure to use details and examples to support your ideas.

Standards Addressed

CC.1.4 Writing

Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content. CC 1.4.8.G Write arguments to support claims.

CC.1.2.8.A, B & K

Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text. Cite the textual evidence that most strongly supports an analysis of what the text says explicitly, as well as inferences, conclusions, and/or generalizations drawn from the text. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools.

Rubrics can be downloaded from: <http://pacareerstandards.com/manufacturing-careers-in-pa>

Acknowledgements

The content of this booklet could not be possible without the contribution and support of the following organizations and companies.

- Pennsylvania Department of Education, Bureau of Career and Technical Education, www.education.state.pa.us
- Pennsylvania Department of Labor and Industry, Center for Workforce Information & Analysis, www.paworkstats.state.pa.us
- Pennsylvania College of Technology, www.pct.edu
- Oberg Industries, Inc., www.oberg.com
- Nielsen-Kellerman, www.nkhome.com
- Sikorsky Global Helicopters, www.sikorsky.com
- Eagle Design Group, www.eagledesigngroup.com
- Ralph S. Alberts Company, www.rsalberts.com
- RapidMade, Inc., www.rapidmade.com
- First Quality Products, Inc., www.firstquality.com
- Actuant Corporation, www.actuant.com
- Volvo Construction Equipment, www.VolvoCE.com/na
- Primus Technologies Corporation, www.primus-tech.com
- The Rodon Group, www.rodongroup.com
- Morgan Corporation, www.morgancorp.com

Similarly, the development of this booklet could not be possible without the contribution and support of the following people.

Pennsylvania Career Development Leaders Network

Patty Bicanich, *Penn State Greater Allegheny*
Elizabeth Biddle, *Pennsylvania College of Technology*
Tanya Berfield, *Pennsylvania College of Technology*
Bernadette Boerckel, *Warrior Run School District*
Judith Bookhammer, *Pennsylvania School Counselors Association*
Michelle Brand, *Pine Grove Area School District*
Kate Brock, *Community Education Council of Elk and Cameron Counties*
Jeannette Carter, *Pennsylvania College of Technology*
Dorothy Chappel, *Jersey Shore Area School District*
Susan Fox, *Hatboro-Horsham School District*
Cynthia Gross, *Bureau of Career & Technical Education, PDE*
Chris Herman, *Loyalsock Township School District*
Betty Holmboe, *PDE Consultant*
Alice Justice, *Central Columbia School District*
Janine Kish, *Allentown School District*
Mame Linford, *Chester County Intermediate Unit*
Karen Rubican, *Canon-McMillan School District*
Charles Sabulski, *Bureau of Career & Technical Education, PDE*
Susan Seigrist, *Allentown School District*
Jud Stauffer, *Dallastown Area School District*
Michael Thompson, *PDE Consultant*

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Philip Wiegand, *Volvo Construction Equipment*

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