

BIO-MEDICAL SECTOR GUIDE



2020

North Central Workforce Development Area

Funded by Workforce Solutions for North Central Pennsylvania and the PA Department of Labor and Industry.

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Introduction to the Sector Guide

The Career Pathways Sector Guides are designed to provide information about career pathways in the North Central Workforce Development Area in Pennsylvania. Each guide presents information that will benefit workforce development professionals, businesses, and job seekers.

Introduction to Career Pathways

This section of the Sector Guide introduces you to career pathways. The information in this section will inform you about why career pathways are important and how the concept can be beneficial to businesses and job seekers. Information in this section can be shared with clients to help them get a better understanding of why we promote pathways.

Sector Description

The sector descriptions provide a brief overview of the sector that the guide presents. Sector descriptions include information from Pennsylvania's Center for Workforce Information and Analysis <https://www.workstats.dli.pa.gov/Pages/default.aspx> that helps to give a snapshot of the sector as well as general information about education and experience levels associated with jobs in the sector and the types of businesses that employ in the sector.

Use the information in this section of the guide to share general information with job seekers, as more detailed information is provided throughout the guide.

Career Pathways Maps

The jobs illustrated on the career pathway maps were identified using the North Central High Priority Occupations list. Information about the jobs was gathered through research using multiple sources to identify the salary, education required, and related occupations. Additionally, industry specific websites that contain career maps were used to inform the career map development. Most of the maps start with an entry-level job that requires less than a 2-year degree and demonstrate the ability to move up

the pathway by on the job training and work experience or through additional formal education and training.

Some occupations occur in multiple sectors and therefore may create a slightly different map for each sector. For example, janitors and cleaners are in manufacturing, healthcare, education, and hospitality. A worker who starts as a janitor and cleaner in education may move into maintenance and may possess the skills to move into a technical teaching role or departmental supervisory role within a school district or university. A janitor in manufacturing might be less likely to leave the sector to move into education and training of maintenance personnel. Technology and transportation related occupations are others that cross over many sectors and may look a little different.

Notice that some pathways seem to start at a higher “entry-level” than others. These would be appropriate for individuals that may have had some technical training while in high school or chose to do training before entering or reentering the workforce. These maps are also appropriate for places of employment that bring everyone in as a “general worker”, and in order to move up, an individual has to get a specialized training and compare multiple options/maps to make that decision.

These maps can be used with job seekers who are currently employed or choosing a career path. While these maps are general for the sector, they provide information about expected training, experience, and skills needed to move along a career path. This example illustrates the information that you will find about each job on every map.

Occupation: First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)

Education: postsecondary certificate and/or associate’s degree

Training: postsecondary education

Skills: understands process and product or service, demonstrates self-management strategies, lifelong learning

Salary Range: \$25.50-46/hour

Use this information to assist job seekers with career exploration, career planning, and goal setting. It is important to review each map carefully to understand the requirements needed on all steps of the

career path. Each map shows potential opportunities for advancement that may be achieved through additional education and training and experience on-the-job. Additional ways to use career pathways maps can be found at *20 Ways to Use Career Pathways Maps* at <http://www.paadultedresources.org/wp-content/uploads/2017/02/20-ways-to-use-career-pathway-maps-12-18-17.pdf>.

Job Descriptions

The job descriptions in the guide provide details of every job that is mentioned in each of the career pathways maps. Information from O*NET Online <https://www.onetonline.org/> was used to inform the descriptions. Another key component of the job descriptions is the *Sample of reported job titles*. These job titles are important because they are examples that employers might use for the same job. For example, an *energy auditor* at ABC Company might have the job title of *Building Performance Specialist* at DEF Company even though they do essentially the same kind of work.

Job descriptions are helpful for job seekers to get a clearer understanding of the jobs in isolation. More importantly, the descriptions help to provide clarity on how a career pathway builds on the skills and knowledge, and abilities of the jobs on the pathways. Use the information in this section to discuss the general qualifications of the job and the alternative names associated with the work that the job requires. Each job's description includes a citation and reference in the bibliography that can easily be accessed to provide additional information about the job. Use the references to assist job seekers in further career exploration when making decisions about any career path.

Foundation Skills Framework

Selected jobs in this section of the guide are aligned to specific workforce preparation skills detailed in the Foundation Skills Framework (FSF). The FSF is a tool developed by workforce development professionals that identifies skills, competencies, and tasks that individuals need to master to get a job, keep a job, and advance in a job.

The jobs in this section are primarily the entry level jobs identified on each map in the guide. Top *skills* for each job that are identified on O*NET Online were aligned to the FSF and can be used to help job seekers get an understanding of the workforce preparation skills that they will need for a particular job.

While this section provides examples of the workforce preparation skills for some of the jobs in the sector, additional research can be completed for any of the jobs on the pathways. Encourage job seekers to review the skills needed for their jobs of interest and compare them to the FSF. Additional FSF resources, including an assessment and competency lists can be found at <https://www.paadultedresources.org/foundation-skills-framework/>.

Bibliography

This final section of the guide is the bibliography. The bibliography provides a listing of all of the resources that were used to research the information in the guide and can be used to conduct further research on the sector or career pathways.

Introduction to Career Pathways

The Workforce Innovation and Opportunity Act (WIOA) moved career pathways from just a good idea to a mandatory component of workforce development programming. While providing a comprehensive definition of and for career pathways, WIOA does little to describe the “how to” for this strategy. From the development of customized mapping tools for employers to integrated education and training programs for customers who are determined basic skills deficient, career pathways strategies are customized to the local labor market.

At a minimum, career pathways strategies for job seekers need to include opportunities to explore careers and occupations that fall within high priority occupation sectors, develop a career pathway plan that includes charting specific and realistic goals, and learn about and practice key employability skills. A concrete plan with established goals and steps to follow can offer guidance and structure to job seekers’ employment goals. This plan may include, for example, obtaining work while exploring careers, identifying and enrolling in educational or training opportunities, identifying, researching, and preparing for occupations so that they may be ready to begin the job search process immediately.

Workforce development professionals can use the information associated with career pathways to further develop opportunities for job seekers to enter a career path rather than just getting a job. To do this; however, career pathways strategies need to be recognized and embraced by workforce development professionals in order to coordinate service delivery so that individuals can become aware of opportunities and have access to what they need to move along a pathway.

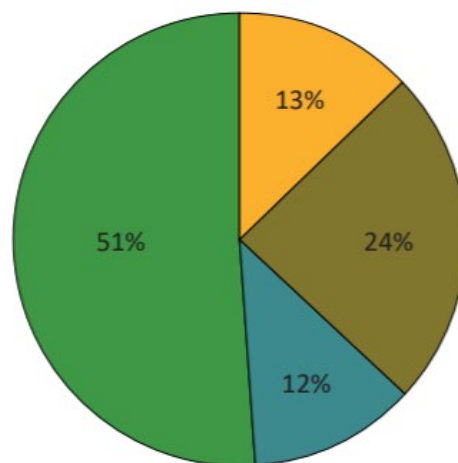
While this guide presents the “nuts and bolts” of career pathways, professionals will need to work together to develop strategies to assist job seekers to move along these paths. Which of the illustrated pathways are most essential to the region? How can workforce development professionals work together to promote these essential pathways? What can we do to include postsecondary education and training partners to assist in these career pathways strategies? How can we include Title II adult education into our strategies? There are answers to all these questions when we work together with career pathways innovations.

Sector Description

The Center for Workforce Information and Analysis states:

The Bio-Medical (BM) cluster includes industries that develop and use technology to enhance life from a health perspective. Industries in this cluster include research laboratories, pharmaceutical manufacturing, surgical and medical equipment manufacturing, and imaging centers. This cluster largely represents industries that employ advanced technology and serve as a foundation for enhanced medical services.

As seen in the graph below, postsecondary education is required to enter employment for nearly 63 percent of BM jobs. This industry may be best suited for individuals that are interested in achieving a bachelor's degree or higher. According to the North Central Multi-year Regional Plan, "Although the percentage of employment requiring advanced degrees today is small (only 2.5%), the employment projection shows 12.7% growth in that area."



In preparation for that growth, The Center for Workforce Information and Analysis identifies the following top industries:

Top Industries Based on Employment

- Physical, Engineering & Biological Research
- Pharmaceutical Preparation Manufacturing
- Medical Laboratories
- Surgical & Medical Instrument Manufacturing
- Other Biological Product Manufacturing
- Surgical Appliance & Supplies Manufacturing
- Diagnostic Imaging Centers
- Electromedical Apparatus Manufacturing
- Social Science & Humanities Research
- Dental Laboratories
- Dental Equipment & Supplies Manufacturing
- Ophthalmic Goods Manufacturing
- Medicinal & Botanical Manufacturing
- In-Vitro Diagnostic Substance Manufacturing
- Optical Instrument & Lens Manufacturing

Many of the industries noted are related to biomedical manufacturing. It is possible, over time, the rich history of manufacturing and the future potential of biomedical could combine in the North Central WDA. Individuals looking to be part of biomedical manufacturing will need to have strong STEM (science, technology, engineering, or math) skills. The United States Department of Education notes that thorough STEM education, “individuals solve problems, make sense of information, and know how to gather and evaluate evidence to make decisions.” (United States Department of Education, 2020). Many of the Foundation Skills Framework competency lists including solves problems, observes critically, works in teams, makes decisions, and lifelong learning skills outline ways individuals can show evidence of using STEM skills.

Career Pathways Maps

Bio-Medical- Chemical Technicians

Additional training and education



Occupation: Biochemical Engineer (17-2199.01)

Education: bachelor's degree or higher

Training: vocational and on-the-job training

Skills: solves problems, demonstrates quality consciousness, applies mathematical concepts and operations

Salary Range: \$27-45/hour

Occupation: Chemists (19-2031)

Education: bachelor's degree or higher

Training: vocational and on-the-job training

Skills: observes critically, applies mathematical concepts and operations, uses technology

Salary Range: \$22-35/hour

Occupation: Chemical Technicians (29-2011)

Education: associate's degree or higher

Training: vocational and short-term on-the-job training

Skills: lifelong learning, applies mathematical concepts and operations, makes decisions

Salary Range: \$15-26.75/hour

Occupation: Chemical Equipment Operators and Tenders (51-9011)

Education: high school diploma or equivalent

Training: short-term on-the-job training

Skills: uses technology, solves problems, demonstrates quality consciousness

Salary Range: \$14.75-22/hour

Bio-Medical-

Inspectors, Testers, Sorters, Samplers, and Weighers

Additional training and education



Occupation: General and Operations Managers (11-1021)

Education: bachelor's degree

Training: vocational and on-the-job training

Skills: understands finances, makes decisions, demonstrates effective interpersonal relations

Salary Range: \$25-54/hour

Occupation: First-Line Supervisors of Production and Operating Workers (51-1011)

Education: high school diploma or equivalent and/or bachelor's degree

Training: long-term on-the-job training, postsecondary, and/or apprenticeship

Skills: demonstrates effective interpersonal relations, understands process or product and service, makes decisions

Salary Range: \$18-29/hour

Occupation: Manufacturing Production Technicians (17-3029.09)

Education: high school diploma or equivalent and/or associate's degree

Training: postsecondary training or apprenticeship

Skills: listens with understanding, speaks clearly and concisely, demonstrates quality consciousness

Salary Range: \$16-25.75/hour

Occupation: Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)

Education: high school diploma or equivalent

Training: short-term on-the-job training

Skills: observes critically, speaks clearly and concisely, reads with understanding

Salary Range: \$11.75-19/hour

Bio-Medical-

Medical and Clinical Laboratory Technicians

Additional training and education



Occupation: Medical Scientists (19-1042)

Education: doctoral degree and/or post-doctoral training

Training: long-term vocational and on-the-job training

Skills: solves problems, demonstrates self-management strategies, applies mathematical concepts and operations

Salary Range: \$29-80/hour

Occupation: Biological Technicians (19-4021)

Education: bachelor's degree or higher

Training: vocational and on-the-job training

Skills: observes critically, applies mathematical concepts and operations, uses technology

Salary Range: \$22-35/hour

Occupation: Medical and Clinical Laboratory Technologists (29-2011)

Education: bachelor's degree or higher

Training: vocational and short-term on-the-job training

Skills: understands process and product or service, demonstrates effective interpersonal relations, observes critically

Salary Range: \$15-26.25/hour

Occupation: Medical and Clinical Laboratory Technicians (31-9095)

Education: associate's degree or higher

Training: vocational and short-term on-the-job training

Skills: reads with understanding, solves problems, makes decisions

Salary Range: \$14.75-24.50/hour

Bio-Medical-

Mixing and Blending Machine Setters, Operators, and Tenders

Additional training and education



Occupation: General and Operations Managers (11-1021)

Education: bachelor's degree

Training: vocational and on-the-job training

Skills: understands finances, makes decisions, demonstrates effective interpersonal relations

Salary Range: \$25-54/hour

Occupation: Chemical Plant and System Operators (51-8091)

Education: high school diploma or equivalent and/or some college

Training: long-term on-the-job and/or postsecondary training

Skills: solves problems, understands process or product and service, makes decisions

Salary Range: \$21-29/hour

Occupation: Chemical Equipment Operators and Tenders (51-9011)

Education: high school diploma or equivalent

Training: short-term on-the-job training

Skills: observes critically, demonstrates quality consciousness, applies health and safety concepts

Salary Range: \$14.75-22/hour

Occupation: Mixing and Blending Machine Setters, Operators, and Tenders (51-9023)

Education: high school diploma or equivalent

Training: short-term on-the-job training

Skills: observes critically, speaks clearly and concisely, listens with understanding

Salary Range: \$12.75-18.50/hour

Bio-Medical- Pharmacy Aides

Additional training and education



Occupation: Medical Scientists (19-1042)
Education: doctoral degree and/or post-doctoral training
Training: long-term vocational and on-the-job training
Skills: solves problems, demonstrates self-management strategies, applies mathematical concepts and operations
Salary Range: \$29-80/hour

Occupation: Pharmacists (29-1051)
Education: master's degree or higher
Training: vocational training
Skills: lifelong learning, reads with understanding, applies mathematical concepts and operations
Salary Range: \$35-57.75/hour

Occupation: Pharmacy Technician (29-2052)
Education: high school diploma or equivalent
Training: short-term on-the-job training
Skills: solves problems, reads with understanding, applies mathematical concepts and operations
Salary Range: \$10-15.75/hour

Occupation: Pharmacy Aides (31-9095)
Education: high school diploma or equivalent
Training: short-term on-the-job training
Skills: listens with understanding, speaks clearly and concisely, uses technology
Salary Range: \$8.50-11/hour

Bio-Medical-

Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products

Additional training and education



Occupation: Chief Executives (11-1011)
Education: bachelor's or master's degree
Training: vocational and on-the-job training
Skills: understands process and product or service, makes decisions, demonstrates effective interpersonal relations
Salary Range: \$53-100/hour

Occupation: Sales Engineers (41-9031)
Education: bachelor's degree or higher
Training: vocational training
Skills: solves problems, understands process or product and service, applies mathematical concepts and operations
Salary Range: \$30-73/hour

Occupation: Sales Managers (11-2022)
Education: bachelor's degree
Training: vocational training
Skills: observes critically, makes decisions, understands product and process or service
Salary Range: \$35-67/hour

Occupation: Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products (41-4011)
Education: bachelor's degree
Training: vocational training
Skills: understands finances, speaks clearly and concisely, listens with understanding
Salary Range: \$20-33/hour

Bio-Medical Job Descriptions

Biochemical Engineer

Develop usable, tangible products, using knowledge of biology, chemistry, or engineering. Solve problems related to materials, systems, or processes that interact with humans, plants, animals, microorganisms, or biological materials.

Sample of reported job titles: Engineering Director, Process Engineer, Research Associate, Research Engineer, Research Fellow, Research Greenhouse Supervisor, Research Scientist, University Extension Specialist (U.S. Department of Labor, O*NET, Biochemical Engineer, 2020a)

Biological Technicians

Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.

Sample of reported job titles: Biological Science Laboratory Technician, Biological Science Technician, Biological Technician, Laboratory Technician, Marine Fisheries Technician, Research Assistant, Research Associate, Research Specialist, Research Technician, Wildlife Biology Technician (U.S. Department of Labor, O*NET, Biological Technicians, 2020b)

Chemical Technician

Conduct chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences.

Sample of reported job titles: Chemical Analyst, Chemical Technician, Formulation Technician, Laboratory Analyst (Lab Analyst), Laboratory Technician (Lab Tech), Laboratory Tester (Lab Tester), Organic Preparation Analyst (Organic Prep Analyst), Quality Control Technician (QC Technician), Research Technician, Water Quality Technician (U.S. Department of Labor, O*NET, Chemical Technician, 2020c)

Chemical Equipment Operators and Tenders

Operate or tend equipment to control chemical changes or reactions in the processing of industrial or consumer products. Equipment used includes devulcanizers, steam-jacketed kettles, and reactor vessels.

Sample of reported job titles: Chemical Operator, Chlorination Operator, Multiskill Operator, Operator, Outside Operator, Process Operator, Production Operator, Production Technician, Spray Dry Operator, Vessel Operator (U.S. Department of Labor, O*NET, Chemical Equipment Operators and Tenders, 2020d)

Chemical Plant and System Operators

Control or operate entire chemical processes or system of machines.

Sample of reported job titles: Chemical Operator, Loader Technician, Machine Operator, Operations Technician, Operator, Process Control Operator, Process Development Associate, Process Operator, Process Technician, Production Technician (U.S. Department of Labor, O*NET, Chemical Plant and System Operators, 2020e)

Chemists

Conduct qualitative and quantitative chemical analyses or experiments in laboratories for quality or process control or to develop new products or knowledge.

Sample of reported job titles: Air Quality Chemist, Analytical Chemist, Chemical Laboratory Scientist, Chemist, Forensic Chemist, Forensic Scientist, Quality Control Chemist (QC Chemist), Research Chemist, Scientist, Senior Chemist (U.S. Department of Labor, O*NET, Chemists, 2020f)

Chief Executives

Determine and formulate policies and provide overall direction of companies or private and public sector organizations within guidelines set up by a board of directors or similar governing body. Plan, direct, or coordinate operational activities at the highest level of management with the help of subordinate executives and staff managers.

Sample of reported job titles: Chief Diversity Officer (CDO), Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Nursing Officer, Chief Operating Officer (COO), Executive Director,

Executive Vice President (EVP), Operations Vice President, President, Vice President (U.S. Department of Labor, O*NET, Chief Executives, 2020g)

First-Line Supervisors of Production and Operating Workers

Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators.

Sample of reported job titles: Assembly Supervisor, Department Manager, Manufacturing Supervisor, Molding Supervisor, Production Manager, Production Supervisor, Quality Assurance Supervisor (QA Supervisor), Shift Supervisor, Supervisor, Team Leader (U.S. Department of Labor, O*NET, First-Line Supervisors of Production and Operating Workers, 2020h)

General and Operations Managers

Plan, direct, or coordinate the operations of public or private sector organizations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services.

Sample of reported job titles: Business Manager, Facility Manager, General Manager (GM), Operations Director, Operations Manager, Plant Superintendent, Store Manager (U.S. Department of Labor, O*NET, General and Operations managers, 2020i)

Inspectors, Testers, Sorters, Samplers, and Weighers

Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.

Sample of reported job titles: Inspector, Picker / Packer, Quality Assurance Auditor, Quality Assurance Inspector (QA Inspector), Quality Assurance Technician, Quality Auditor, Quality Control Inspector (QC Inspector), Quality Control Technician (QC Technician), Quality Inspector, Quality Technician (U.S. Department of Labor, O*NET, Inspectors, Testers, Sorters, Samplers, and Weighers, 2020j)

Manufacturing Production Technicians

Set up, test, and adjust manufacturing machinery or equipment, using any combination of electrical, electronic, mechanical, hydraulic, pneumatic, or computer technologies.

Sample of reported job titles: Engineering Technician, Experimental Machining Lab Manager, Final Operations Technician, Metallurgical Lab Technician, Quality Assurance Technician, Quality Technician, Service Technician, Support Technician, Tool Room Supervisor, Value Stream Manager (U.S. Department of Labor, O*NET, Manufacturing Production Technician, 2020k)

Medical and Clinical Laboratory Technicians

Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.

Sample of reported job titles: Certified Clinical Laboratory Technician, Clinical Laboratory Scientist, Clinical Laboratory Technician (Clinical Lab Technician), Laboratory Assistant (Lab Assistant), Laboratory Supervisor, Laboratory Technician, Medical Laboratory Technician (MLT), Medical Laboratory Technicians (Medical Lab Technician), Medical Technician (U.S. Department of Labor, O*NET, Medical and Clinical Laboratory Technicians, 2020l)

Medical and Clinical Laboratory Technologists

Perform complex medical laboratory tests for diagnosis, treatment, and prevention of disease. May train or supervise staff.

Sample of reported job titles: Chief Medical Technologist; Clinical Laboratory Scientist (CLS); Clinical Laboratory Technologist; Histologist Technologist; Medical Laboratory Technologist (Medical Lab Tech); Medical Technologist (MT); Medical Technologist, Clinical Laboratory Scientist; Microbiologist; Microbiology Technologist; Research Assistant (U.S. Department of Labor, O*NET, Medical and Clinical Laboratory Technologists, 2020m)

Medical Scientists

Conduct research dealing with the understanding of human diseases and the improvement of human health. Engage in clinical investigation, research and development, or other related activities. Includes physicians, dentists, public health specialists, pharmacologists, and medical pathologists who primarily conduct research.

Sample of reported job titles: Associate Director, Experimental Medicine; Clinical Laboratory Scientist; Clinical Pharmacologist; Investigator; Laboratory Director; Post-Doctoral Fellow; Research Scientist; Scientist; Senior Research Scientist; Senior Scientist (U.S. Department of Labor, O*NET, Medical Scientists, 2020n)

Mixing and Blending Machine Setters, Operators, and Tenders

Set up, operate, or tend machines to mix or blend materials, such as chemicals, tobacco, liquids, color pigments, or explosive ingredients.

Sample of reported job titles: Blender, Blending Technician, Coater Operator, Ink Blender, Ink Maker, Issuing Operator, Machine Operator, Mixer, Mixer Operator, Stock Preparation Operator (Stock Prep Operator) (U.S. Department of Labor, O*NET, Mixing and Blending Machine Setters, Operators, and Tenders, 2020o)

Pharmacists

Dispense drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. May advise physicians and other health practitioners on the selection, dosage, interactions, and side effects of medications.

Sample of reported job titles: Clinical Pharmacist; Hospital Pharmacist; Outpatient Pharmacy Manager; Pharmacist; Pharmacist in Charge (PIC); Pharmacist in Charge, Owner (PIC, Owner); Pharmacy Informaticist; Registered Pharmacist; Staff Pharmacist; Staff Pharmacist, Hospital (U.S. Department of Labor, O*NET, Pharmacists, 2020p)

Pharmacy Aides

Record drugs delivered to the pharmacy, store incoming merchandise, and inform the supervisor of stock needs. May operate cash register and accept prescriptions for filling.

Sample of reported job titles: Ancillary, Certified Pharmacist Assistant, Drug Purchaser, Front Counter Clerk, Pharmacist Assistant, Pharmacy Aide, Pharmacy Ancillary, Pharmacy Assistant, Pharmacy Cashier, Pharmacy Clerk (U.S. Department of Labor, O*NET, Pharmacy Aides, 2020q)

Pharmacy Technician

Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications according to prescription orders.

Sample of reported job titles: Accredited Pharmacy Technician; Billing and Quality Technician; Certified Pharmacy Technician (CPhT); Compounding Technician; Lead Pharmacy Tech, Certified Pharmacy Technician (Lead Pharmacy Tech, CPhT); Lead Pharmacy Technician (Lead Pharmacy Tech); Pharmacy Technician (Pharmacy Tech); Senior Pharmacy Technician; Technician; Technician, Inventory Specialist (U.S. Department of Labor, O*NET, Pharmacy Technician, 2020r)

Sales Engineers

Sell business goods or services, the selling of which requires a technical background equivalent to a baccalaureate degree in engineering.

Sample of reported job titles: Account Executive; Account Manager; Customer Engagement Manager; Product Manager; Product Sales Engineer; Sales Engineer; Sales Engineer, Account Manager; Sales Engineer, Engineered Products; Senior Sales Engineer; Technical Sales Engineer (U.S. Department of Labor, O*NET, Sales Engineers, 2020s)

Sales Managers

Plan, direct, or coordinate the actual distribution or movement of a product or service to the customer. Coordinate sales distribution by establishing sales territories, quotas, and goals and establish training programs for sales representatives. Analyze sales statistics gathered by staff to determine sales potential and inventory requirements and monitor the preferences of customers.

Sample of reported job titles: District Sales Manager, National Sales Manager, Regional Sales Manager, Sales and Marketing Vice President, Sales Director, Sales Manager, Sales Representative, Sales Supervisor, Sales Vice President, Store Manager (U.S. Department of Labor, O*NET, Sales Managers, 2020t)

Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products

Sell goods for wholesalers or manufacturers where technical or scientific knowledge is required in such areas as biology, engineering, chemistry, and electronics, normally obtained from at least 2 years of post-secondary education.

Sample of reported job titles: Account Development Manager, Account Executive, Account Manager, Channel Sales Director, Distribution Sales Manager, Inside Sales Representative, Marketing Representative, Sales Director, Sales Manager, Sales Representative (U.S. Department of Labor, O*NET, Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products, 2020u)

*Top Foundation Skills Required for Jobs in the
Bio-Medical Sector*



Using information from O*NET job summaries, the following skills from the Foundation Skills Framework were identified as important skills for jobs in the bio-medical sector.

Chemical Equipment Operators and Tenders

Observes Critically

Critical and reflective thinking and discrimination skills needed to notice, analyze, and respond to visual information, especially in irregular or unusual situations

Listens with Understanding

Skills needed to comprehend, analyze, and interpret orally presented communications and directions on familiar and unfamiliar topics

Makes Decisions

Critical, creative, and reflective thinking skills needed to consider relevant facts and opinions, evaluate potential risks and benefits of various decisions, make a decision, and analyze its outcome

Speaks Clearly and Concisely

Skills needed to express ideas and information orally in a clear and understandable manner while sustaining interest and attention

Reads with Understanding

Skills needed to read and understand written work-related information, such as reading for various purposes - reading to complete a task, locate specific information, or critically analyze information

Inspectors, Testers, Sorters, Samplers, and Weighers

Observes Critically

Critical and reflective thinking and discrimination skills needed to notice, analyze, and respond to visual information, especially in irregular or unusual situations

Listens with Understanding

Skills needed to comprehend, analyze, and interpret orally presented communications and directions on familiar and unfamiliar topics

Makes Decisions

Critical, creative, and reflective thinking skills needed to consider relevant facts and opinions, evaluate potential risks and benefits of various decisions, make a decision, and analyze its outcome

Speaks Clearly and Concisely

Skills needed to express ideas and information orally in a clear and understandable manner while sustaining interest and attention

Reads with Understanding

Skills needed to read and understand written work-related information, such as reading for various purposes - reading to complete a task, locate specific information, or critically analyze information

Medical and Clinical Laboratory Technicians

Listens with Understanding

Skills needed to comprehend, analyze, and interpret orally presented communications and directions on familiar and unfamiliar topics

Reads with Understanding

Skills needed to read and understand written work-related information, such as reading for various purposes - reading to complete a task, locate specific information, or critically analyze information

Observes Critically

Critical and reflective thinking and discrimination skills needed to notice, analyze, and respond to visual information, especially in irregular or unusual situations

Solves Problems

Critical, creative, and reflective thinking skills needed to identify problems, analyze and evaluate various solutions, implement solutions and monitor their effectiveness

Speaks Clearly and Concisely

Skills needed to express ideas and information orally in a clear and understandable manner while sustaining interest and attention

Mixing and Blending Machine Setters, Operators, and Tenders

Listens with Understanding

Skills needed to comprehend, analyze, and interpret orally presented communications and directions on familiar and unfamiliar topics

Reads with Understanding

Skills needed to read and understand written work-related information, such as reading for various purposes - reading to complete a task, locate specific information, or critically analyze information

Observes Critically

Critical and reflective thinking and discrimination skills needed to notice, analyze, and respond to visual information, especially in irregular or unusual situations

Lifelong Learning

Core foundation skills that enable one to reach realistic learning and employment goals through lifelong learning opportunities; includes knowing how to learn, applying skills in new contexts, and anticipating and adapting to changes in the workplace

Speaks Clearly and Concisely

Skills needed to express ideas and information orally in a clear and understandable manner while sustaining interest and attention

Pharmacy Aides

Listens with Understanding

Skills needed to comprehend, analyze, and interpret orally presented communications and directions on familiar and unfamiliar topics

Reads with Understanding

Skills needed to read and understand written work-related information, such as reading for various purposes - reading to complete a task, locate specific information, or critically analyze information

Observes Critically

Critical and reflective thinking and discrimination skills needed to notice, analyze, and respond to visual information, especially in irregular or unusual situations

Makes Decisions

Critical, creative, and reflective thinking skills needed to consider relevant facts and opinions, evaluate potential risks and benefits of various decisions, make a decision, and analyze its outcome

Speaks Clearly and Concisely

Skills needed to express ideas and information orally in a clear and understandable manner while sustaining interest and attention

Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products

Reads with Understanding

Skills needed to read and understand written work-related information, such as reading for various purposes - reading to complete a task, locate specific information, or critically analyze information

Speaks Clearly and Concisely

Skills needed to express ideas and information orally in a clear and understandable manner while sustaining interest and attention

Listens with Understanding

Skills needed to comprehend, analyze, and interpret orally presented communications and directions on familiar and unfamiliar topics

Solves Problems

Critical, creative, and reflective thinking skills needed to identify problems, analyze and evaluate various solutions, implement solutions and monitor their effectiveness

Lifelong Learning

Core foundation skills that enable one to reach realistic learning and employment goals through lifelong learning opportunities; includes knowing how to learn, applying skills in new contexts, and anticipating and adapting to changes in the workplace

NOTE: All the information on pages 24-28 of this guide is taken verbatim from the Foundation Skills Framework Competency Lists (2016) accessed at http://www.paadultedresources.org/wp-content/uploads/2016/05/FSF-competency_list-12-18-17.pdf

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