

13

Learning About Careers

Key Terms

myth
logistics
e-marketing
associate degree
bachelor's degree
occupational trends

Chapter Objectives

After studying this chapter, you will be able to

- **identify** myths regarding employment in nontraditional jobs.
- **explain** the differences among the career clusters.
- **describe** the wide range of jobs within career clusters.
- **select** careers and occupations that interest you.
- **list** occupations with the greatest number of job openings and their educational requirements.

Reading Advantage

Describe how this chapter relates to a chapter you read earlier in the semester.



Key Concepts

- Your interests, aptitudes, abilities, values, and goals influence your career choices.
- Myths about employment can put artificial limits on your career choices.
- The career clusters and pathways can help you learn about careers that fit all aspects of who you are and want to become.
- Occupations require different levels of education and training, but those requiring more often pay better.
- You will have an easier time of finding a job if the occupation you want is in demand.

As you learned in Chapter 12, there are many aspects about yourself that can impact your entire life—especially when selecting a career. You might ask yourself “How will my interests, aptitudes, and abilities influence my career choices? What career options fit my abilities, values, and goals for the future?”

When seeking the answers to these questions, it is helpful to reflect on past, current, and future factors that influence career options, 13-1. As you read the following paragraphs, think about your interests, aptitudes, and abilities. How might your values and goals, as well as beliefs and traditions, influence your career choices? How can the career clusters help you find a career that fits?

Traditional and Nontraditional Careers

Reflect Further

What traditions or beliefs do you hold that may influence your career options?

The beliefs and traditions of a society often dictate which groups should hold which jobs. For example, careers involving children and the family were once traditionally reserved for women. Careers that were typical for one gender but not the other are called *nontraditional*. A man working as a nurse and a woman working as a bricklayer are examples of nontraditional careers. In a society that respects equal rights for all workers, job skills are more important than tradition.

There are many myths regarding people employed in nontraditional careers. A **myth** is an unfounded belief or notion. Figure 13-2 examines some of these myths. As you look for a suitable career, it is important to remember that myths place artificial limits on your options. If you can do a job well, employers who focus on job skills, not myths, will welcome you.



Using the Career Clusters

Some of the most important and up-to-date resources to help you make career decisions are the career clusters. As you recall, the career clusters group occupations by common knowledge and skills. While reading about the career clusters and the occupations they include, think about your interests, aptitudes, and abilities. What careers spark your interest? Do they link to interests that ignite your passion? Do these careers fit your aptitudes and abilities? How might certain careers link to your values and goals?

13-1

Reflecting on all aspects of who you are can help you make wise career decisions.

Myths Regarding Employment in Nontraditional Jobs	
Myth	Fact
Myth #1: Women in clerical jobs dress so well that surely they make more money than trade workers.	<p>Fact: This is not true. Consider the difference in the following entry-level weekly salaries:</p> <ul style="list-style-type: none"> • Office clerk: \$456 • Food service cook: \$392 • Receptionist: \$440 • Secretary: \$528 • Chemical technician: \$1,173 • Drafter: \$840 • Electrician: \$839 • Welder: \$604 <p><i>Note: While current salaries may differ, pay gaps between positions remain.</i></p>
Myth #2: Men aren't nurturing or sensitive enough to work with small children, the elderly, or the sick as caregivers.	Fact: Besides the many caring fathers, grandfathers, and brothers who often care for family members, many men are successful elementary school teachers, nurses, paramedics, nursing assistants, and other professional caregivers. (Male caregivers provide excellent role models for young children and help erase many of the negative stereotypes about men.)
Myth #3: Women are not strong enough to work as skilled laborers.	Fact: The average woman is strong enough to work as a skilled laborer because modern machinery and tools have made many jobs easier. Also, women can build strength while on these jobs.
Myth #4: Men who work in nontraditional careers aren't very masculine.	Fact: Men in nontraditional careers come in all sizes, shapes, and types. They are as manly as men in other career fields.
Myth #5: Work in the trades can be dirty and women don't like to get messy.	Fact: Women traditionally do "dirty" jobs such as changing diapers, gardening, and housecleaning.
Myth #6: Men who choose nontraditional careers aren't skilled or strong enough to be employed in traditionally male careers.	Fact: Men choose nontraditional careers because of their interests, skills, and abilities. They have the capacity to perform skilled tasks, such as dispensing medicine to the sick, and they work in conditions that require strength, such as lifting nursing home residents.
Myth #7: Women who work in the trades are too rough and tough to be feminine.	Fact: Just because a female wears rugged work clothes and gets dirty doesn't mean she is any less feminine.
Myth #8: Men in nontraditional careers earn less money than men employed in traditional careers.	Fact: Men in nontraditional careers, especially those who own their own business or work as a supervisor, can earn more than men employed in traditional careers.
Myth #9: Females don't have the math ability for work in the trades.	Fact: Using math is not a gender-related activity. Practice and a desire to learn determine how well a person performs math.

13-2

Men and women are pursuing nontraditional careers in great numbers.



People who have jobs in this cluster work with food products and processing, power, and structural systems and plants and animals. Careers in natural resources, environmental services, and agribusiness are also included in this cluster.

Fewer jobs involve traditional farming and ranching. Many careers involve working with food science and technology to discover new food sources, analyze food structure and content, and develop new ways to process, preserve, package, and store food. Workers in natural resources focus on improving the present and future quality of life, conserving natural resources, and preserving wildlife. Conservation scientists help solve problems affecting the use of land, water, and air. Foresters plan and supervise the growing, protection, and use of trees. Environmentalists work to resolve

problems related to pollution and hazardous waste disposal. Animal scientists study genetics, nutrition, and reproduction.

Entry-level jobs are available. Although some knowledge and skills are learned on-the-job, many technical jobs require two or more years of advanced training. Professionals, such as engineers and scientists, must have a four-year college degree or beyond.

The demands of an expanding population, globalization, and increasing public awareness on nutrition and diet will result in strong job opportunities in the future. Many of these specialists work for government agencies, such as the U.S. Department of Agriculture, the Environmental Protection Agency, or the National Park Service. Private employers include mining and logging operations, landscapers, and oil companies.

Pathways and Career Options



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Food Products and Processing Systems

Agricultural Salesperson ■
 Agricultural Communications Specialist ■ Business-Educator ■
 Food Scientist ■ Meat Processor ■ Toxicologist ■
 Biochemist ■ Nutritionist ■
 Dietician ■ Food Broker ■ Food Inspector ■ Meat Cutter-Grader ■
 Meat Science Researcher ■
 Food Meal Supervisor ■ Cheese Maker ■ Microbiologist ■
 Produce Buyer ■ Bacteriologist ■
 Food & Drug Inspector ■
 Bioengineer ■ Biochemist ■
 Food & Fiber Engineer ■ Food Processor ■ Storage Supervisor ■
 Fieldhand ■ Quality Control Specialist

Plant Systems

Bioinformatics Specialist ■
 Plant Breeder & Geneticist ■
 Biotechnology Lab Technician ■
 Soil & Water Specialist ■
 Crop Farm Manager ■
 Agricultural Educator ■ Plant Pathologist ■ Aquaculturalist ■
 Botanist ■ Tree Surgeon ■
 Education & Extension Specialist ■ Commodity Marketing Specialist ■ Grain Operations Superintendent ■
 Forest Geneticist ■ Golf Course Superintendent ■ Greenhouse Manager ■ Grower ■ Farmer ■
 Rancher ■ Custom Hay & Silage Operator ■ Agricultural Journalist

Animal Systems

Agricultural Educator ■
 Livestock Producer ■ Poultry Manager ■ Equine Manager ■
 Veterinarian ■ Veterinary Assistant ■ Feedlot Specialist ■
 Animal Scientist ■ Embryo Technologist ■ Livestock Buyer ■
 Wildlife Biologist ■ Livestock Geneticist ■ Animal Nutritionist ■
 Dairy Producer ■ Livestock Inspector ■ Pet Shop Operator ■
 Feed Sales Specialist ■
 Animal Health Salesperson ■
 Meat Science Researcher ■
 Reproductive Physiologist ■
 Embryo Transfer Technician ■
 USDA Inspector



Power, Structural and Technical Systems

Machine Operator ■ Electronics Systems Technician ■ Agricultural Engineer ■ Agricultural Extension Engineering Specialist ■ Heavy Equipment Maintenance Technician ■ Recycling Technician ■ Waste Water Treatment Plant Operator ■ Parts Manager ■ Welder ■ Machinist ■ Communication Technician ■ GPS Technician ■ Agricultural Applications Software Developer ■ Programmer ■ Computer Service & Technical Support Technician ■ Information Lab Specialist ■ Remote Sensing Specialist

Natural Resource Systems

Cartographer ■ Wildlife Manager ■ Range Technician ■ Ecologist ■ Park Manager ■ Environmental Interpreter ■ Fish & Game Officer ■ Logger ■ Forest Technician ■ Log Grader ■ Pulp & Paper Manager ■ Commercial Fishermen ■ Fishing Vessel Operator ■ Soil Geology Technician ■ Geologist ■ Mining Engineer ■ Fisheries Technician ■ Water Monitoring Technician ■ Hydrologist ■ Fish Hatchery Manager

Environmental Service Systems

Pollution Prevention & Control Manager ■ Pollution Prevention & Control Technician ■ Environmental Sampling & Analysis Scientist ■ Health & Safety Sanitarian ■ Environmental Compliance Assurance Manager ■ Hazardous Materials Handler ■ Hazardous Materials Technician ■ Manager ■ Water Environment Manager ■ Water Quality Manager ■ Waste Water Manager ■ Toxicologist ■ Recycler ■ Solid Waste Technician, Manager, Specialist, or Disposer

Agribusiness Systems

Bank, Insurance Company, or Government Program Field Representative ■ Farm Investment Manager ■ Agricultural Commodity Broker ■ Agricultural Economist ■ Farmer ■ Rancher ■ Feedlot Operator ■ Farm Manager ■ Breeder ■ Dairy Herd Supervisor ■ Agricultural Products Buyer ■ Animal Health Products Distributor ■ Livestock Seller ■ Feed or Farm Supply Store Manager ■ Produce Commission Agent ■ Agricultural Chemical Dealer ■ Chemical Sales Representative



People with careers in architecture and construction are involved in design and pre-construction planning, construction, and maintenance of structures. They may design, build, restore, or maintain homes, bridges, industrial plants, dams, hospitals, highways, and shopping malls. Some careers may involve landscape architecture, urban planning, and interior design.

Architects design the structures to be built. Engineers supervise the building of structures and make sure construction plans are structurally sound. Skilled craft-workers, such as carpenters, bricklayers, roofers, plumbers, and electricians actually build the structures.

You must be licensed before practicing as an architect. After earning a four-year college degree and working as an intern-architect for about three years, you must pass all parts of

the Architect Registration Examination (ARE) in order to become licensed.

Community colleges, technical institutes, and career-technical schools offer certificate and degree programs, ranging from one to three years, for many architecture and construction jobs. Architects, engineers, and construction managers require at least a four-year college degree. Specific job requirements may range from on-the-job training to advanced degrees for other occupations in this cluster.

The employment outlook for careers in this cluster remains steady, especially for workers in design and construction. Those who have broad skills in the area of maintenance operations will have favorable job options in a slower-than-average growth area.





Pathways and Career Options

Design and Preconstruction

Architect ■ Drafter ■ Regional & Urban Planner ■ Designer ■ Industrial Engineer ■ Materials Engineer ■ Environmental Designer ■ Civil Engineer ■ Programmer ■ Mechanical Engineer ■ Electrical Engineer ■ Preservationist ■ Environmental Engineer ■ Surveyor ■ Fire Prevention & Protection Engineer ■ Cost Estimator ■ Electrical & Electronic Engineering Technician ■ Civil Engineering Technician ■ Environmental Engineering Technician ■ Surveying & Mapping Technician ■ Interior Designer ■ Landscape Designer ■ Specifications Writer ■ Building Code Official ■ Computer Aided Drafter ■ Renderer ■ Modeler

Construction

General Contractor & Builder ■ Construction Foreman ■ Estimator ■ Project Inspector ■ Sales & Marketing Manager ■ Education & Training Director ■ Safety Director ■ Construction Inspector ■ Subcontractor ■ Field Supervisor ■ Mason ■ Iron & Metalworker ■ Carpenter ■ Electrician ■ Boilermaker ■ Electronic Systems Technician ■ Carpet Installer ■ Sheet-Metal Worker ■ Security & Fire Alarm Systems Installer ■ Concrete Finisher ■ Tile & Marble Setter ■ Landscaper ■ Elevator Installer ■ Roofer ■ Painter ■ Plasterer ■ Paperhanger ■ Drywall Installer ■ Plumber ■ Pipe Fitter ■ Heating, Ventilation, Air Conditioning, & Refrigeration Mechanic ■ Electrician

Maintenance and Operations

General Maintenance Contractor ■ Construction Engineer ■ Construction Manager ■ Estimator ■ Facilities Engineer ■ Environmental Engineer ■ Demolition Engineer ■ Project Inspector ■ Manufacturer's Representative ■ Highway Maintenance Worker ■ Equipment & Material Manager ■ Maintenance Estimator ■ Security Controls Manager ■ Preservationist ■ Remodeler ■ Safety Director ■ Construction Inspector ■ Service Contractor ■ System Installer ■ Electrician ■ Boilermaker ■ Cost Estimator ■ Sheet-Metal Worker ■ Hazardous Materials Remover ■ Steamfitter



Arts, A/V Technology & Communications

If you have creative talents along with strong communication, math, and science skills, this may be the career area for you. These diverse career pathways include visual and performing arts, audio and video (A/V) technology, and film. Journalism and broadcasting, telecommunications, and printing technology are other career directions. The job outlook remains steady for the foreseeable future.

People who work with A/V technology may design, install, or operate audio and video equipment. Those who work in journalism and broadcasting prepare and present information about local, state, national, and international events. Jobs in the performing arts range from actors, dancers, and musicians to instructors, playwrights, and scriptwriters. Costume designers plus lighting and stage crews complete the behind-the-scenes work in performing arts.

Those who work with print technology complete many printing-process tasks to transform text and photos into magazines and books. Working with computers and communications equipment is key to telecommunications. Through a variety of art media, visual artists bring concepts, thoughts, and feelings to life.

Preparation for these careers begins early in life and continues through high school and into adult life. It requires self-discipline and hard work. Although most jobs require some training beyond high school, employment requires talent, not just training and years of experience.

Some entry-level jobs require on-the-job training or an apprenticeship. Most technical jobs require one, two, or three years of training at a technical or community college. Careers in management, education, and journalism may require four-year degrees and beyond.

Pathways and Career Options

Audio and Video Technology and Film

Video Systems Technician ■
 Video Graphics, Special Effects, & Animation Designer ■ Audio-Video Designer & Engineer ■
 Technical Computer Support Technician ■ Audio-Video System Service Technician ■
 Audio Systems Technician

Printing Technology

Graphics & Printing Equipment Operator ■ Lithographer & Platemaker ■ Computer Typography & Composition Equipment Operator ■ Desktop Publishing Specialist ■ Web Page Designer



Visual Arts

Commercial Photographer ■
 Commercial Interior Designer ■
 Residential & Home Furnishings
 Coordinator ■ Graphic
 Designer ■ Computer Aided
 Design Technician ■ Fashion
 Illustrator ■ Textile Designer ■
 Commercial Artist ■ Illustrator
 ■ Artist ■ Gallery Manager ■
 Fashion Designer ■ Curator

Performing Arts

Production Manager
 (Digital, Video, or Stage) ■
 Cinematographer ■ Video Editor
 ■ Dancer ■ Playwright ■ Screen
 Writer ■ Screen Editor ■ Script
 Writer ■ Director & Coach ■ Set
 Designer & Painter ■ Performer
 ■ Actors ■ Musician ■ Costume
 Designer ■ Make-Up Artist ■
 Stagecraft Designer & Lighter
 ■ Stagecraft Sound Effects
 & Acoustics Coordinator ■
 Composer ■ Conductor ■ Music
 Instructor

Journalism and Broadcasting

Audio & Video Operations ■
 Station Manager ■ Radio & TV
 Announcer ■ Editor ■ Journalist
 ■ Reporter ■ Broadcast
 Technician ■ Control Room
 Technician

Telecommunications

Telecommunication Technician
 ■ Installer ■ Telecommunica-
 tion Computer Programmer &
 Systems Analyst ■ Telecommu-
 nication Equipment, Cable, or
 Line Repairer



Business, Management & Administration

Careers in this cluster involve skills that businesses need to keep productive and running smoothly. Management, business financial management and accounting, and human resources are some career options. Business analysis, marketing, and administration and information support are also included in this cluster. Broad skills in planning, organizing, and evaluating business operations are essential. Businesspeople also need good computer skills, common sense, decision-making skills, and problem-solving abilities.

Business managers form policies and direct the operations of corporations, nonprofit groups, and government agencies. Financial managers and accountants create and use accounting systems to analyze and prepare financial reports. People who work in business analysis find

cost-effective ways to do business. They also uphold business values and strategies. Marketing workers may do market research and promote, sell, and maintain products and services. Workers in administration and information support use technology to gather and deliver information and perform other office duties.

Some entry-level jobs may require certification and a two-year or four-year degree. Most jobs in this career cluster require a four-year degree from a college or university. Top managers, financial analysts, and human resources specialists often need advanced degrees beyond their four-year degrees. Work experience is often a requirement in addition to a degree. Business expansion and complexity will result in faster-than-average growth for the careers in this cluster.

Pathways and Career Options

Management

Entrepreneur ■ Chief Executive ■ General Manager ■ Accounting Manager ■ Accounts Payable Manager ■ Assistant Credit Manager ■ Billing Manager ■ Business & Development Manager ■ Compensation & Benefits Manager ■ Credit & Collections Manager ■ Payroll Manager ■ Risk Manager ■ Operations Manager ■ Public Relations Manager ■ Human Resources Manager ■ Management Analyst ■ Facilities Manager ■ Association Manager ■ Meeting & Convention Planner ■ Administrative Services Manager ■ Sports & Entertainment Manager ■ First Line Supervisor ■ Public Relations Specialist ■ Senior Manager ■ Management Trainee

Business Financial Management and Accounting

Accountant ■ Accounting Clerk ■ Accounting Supervisor ■ Adjuster ■ Adjustment Clerk ■ Assistant Treasurer ■ Auditor ■ Bookkeeper ■ Budget Analyst ■ Budget Manager ■ Billing Supervisor ■ Cash Manager ■ Controller ■ Chief Financial Officer ■ Finance Director ■ Certified Public Accountant ■ Accounts Receivable Clerk ■ Cost Accountant ■ Financial Accountant ■ Billing Clerk ■ Payroll Accounting Clerk ■ Merger & Acquisitions Manager ■ Price Analyst ■ Top Collections Executive ■ Top Investment Executive ■ Treasurer



Human Resources

Human Resources Manager ■
 Human Resources Coordinator
 ■ Industrial Relations Director ■
 Compensation & Benefits Manager
 ■ Employee Assistance Plan
 Manager ■ Training & Development
 Manager ■ Corporate Trainer ■
 Arbitrator ■ Employer Relations
 Representative ■ Affirmative
 Action Coordinator ■ Equal
 Employment Opportunity Specialist
 ■ Pay Equity Officer ■ Interpreter
 & Translator ■ Organizational
 Behaviorist ■ Occupational Analyst
 ■ Compensation, Benefits, & Job
 Analyst ■ Human Resources
 Information Systems Specialist
 ■ Meeting & Convention Planner
 ■ Employment Interviewer ■
 Personnel Recruiter

Business Analysis

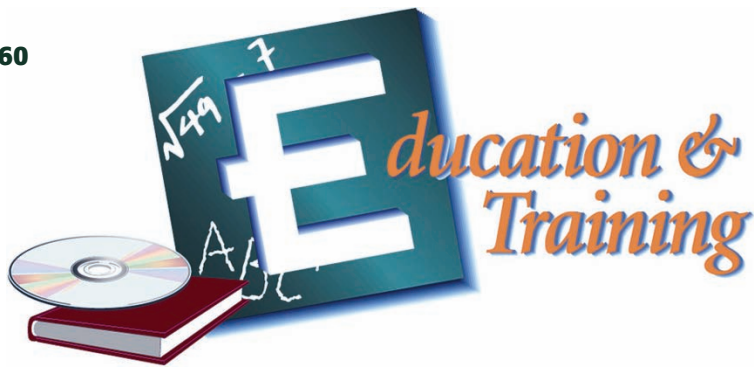
Systems Analyst ■ E-commerce
 Analyst ■ Requirements
 Specialist ■ Marketing Analyst ■
 Operations Research Analyst ■
 Business Consultant ■ Business
 Analyst ■ Budget Analyst
 ■ Product Manager ■ Price
 Analyst

Marketing

Marketing Manager ■ Sales
 Manager ■ Assistant Store
 Manager ■ Department Manager ■
 Salesperson ■ Customer Service
 Supervisor ■ Customer Service
 Clerk ■ Research & Development
 Manager ■ Small Business Owner
 & Entrepreneur ■ E-commerce
 Manager & Entrepreneur ■
 Demonstrator & Product Promoter ■
 Telemarketer ■ Wholesale & Retail
 Buyer ■ International Distribution
 Manager ■ Warehouse Manager
 ■ Logistics Manager ■ Market
 Researcher ■ Public Relations
 Specialist ■ Media Coordinator ■
 Graphic Designer ■ Event Manager
 ■ Distribution Worker ■ Traffic,
 Shipping, & Receiving Clerk ■
 Copywriter

Administration and Information Support

Administrative Assistant ■
 Executive Assistant ■ Office
 Manager ■ Medical Front
 Office Assistant ■ Information
 Assistant ■ Desktop Publisher
 ■ Customer Service Assistant
 ■ Data Entry Specialist ■
 Receptionist ■ Communications
 Equipment Operator ■ Com-
 puter Operator ■ Court Reporter
 ■ Stenographer ■ Dispatcher ■
 Shipping & Receiving Worker ■
 Records Processor ■ Medical
 Transcriptionist ■ Library Assis-
 tant ■ Order Processor ■ Word
 Processor ■ Typist ■ Legal
 Secretary ■ Paralegal



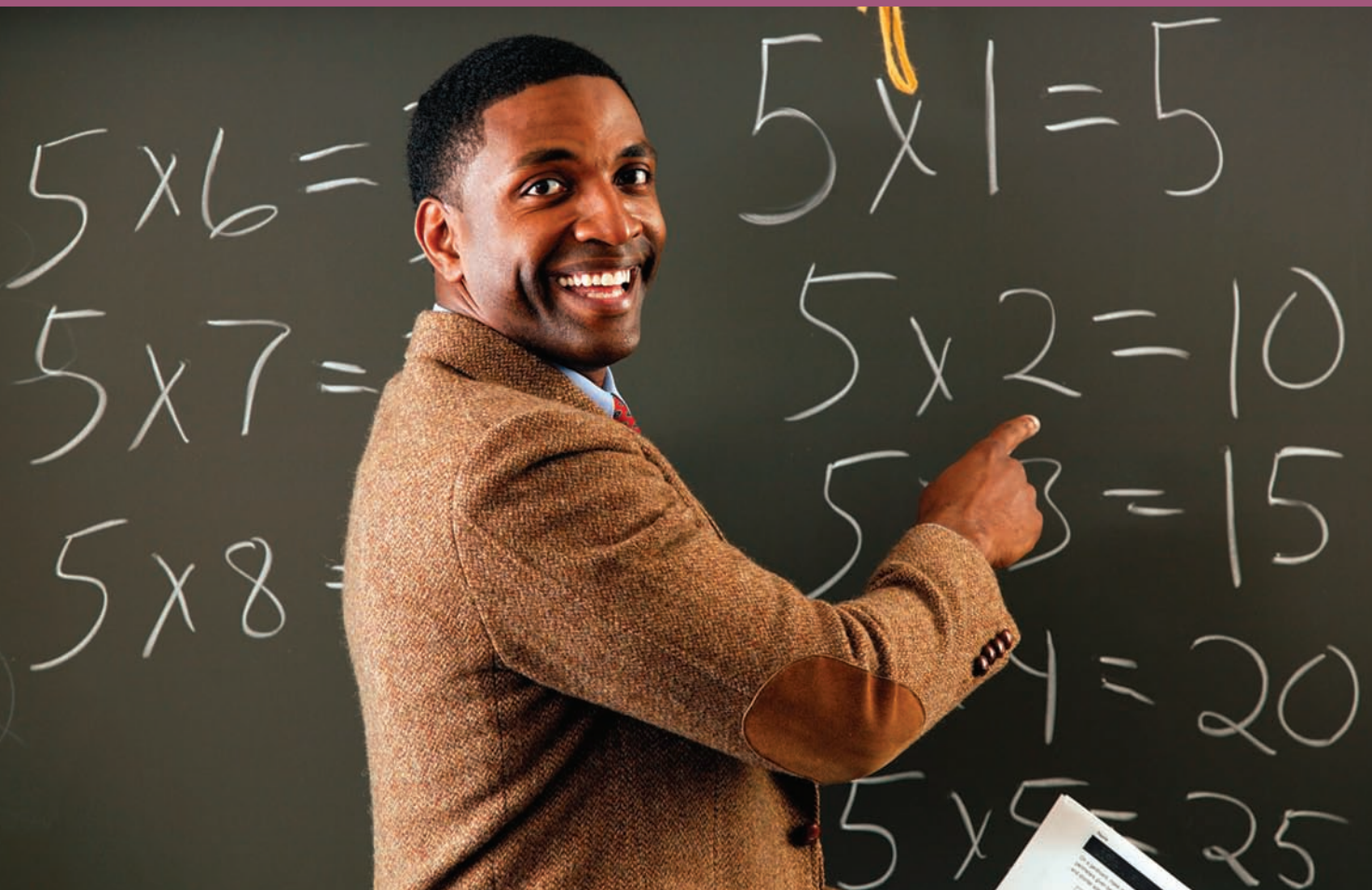
Education & Training

Do you have the ability to inspire and motivate others? Are you sensitive to their varying needs? If you do, a career in education and training may be an option for you. This career area includes teaching and training, professional support services, administration, and administrative support.

Teaching gives you a chance to influence the lives of many students. Highly skilled educators use a variety of teaching methods to help students achieve. Those who work in professional support services—such as psychology, counseling, or social work—help students meet personal, family, and career needs. Strong leadership and management of day-to-day school activities are important skills for school administrators.

Highly skilled teachers spend many of their nonteaching hours upgrading their teaching skills in order to enhance student performance. When compared to many other professional jobs, such as doctors or lawyers, wages for careers in this cluster are often lower. However, benefits and job security are very good in comparison to many other careers. Professionals in this career cluster work in either public or private schools.

Although some entry-level jobs exist, most jobs in this cluster require a four-year-college degree and licensing or certification. Some jobs in professional support services and administration require advanced college degrees. The high demand for highly skilled education and training professionals leads to an excellent job outlook.





Pathways and Career Options

Administration and Administrative Support

Superintendent ■ Principal ■ Administrator ■ Supervisor & Instructional Coordinator ■ Education Researcher ■ Test Measurement Specialist ■ College President ■ Dean ■ Curriculum Developer ■ Instructional Media Designer

Professional Support Services

Psychologist (Clinical, Developmental, or Social) ■ Social Worker ■ Parent Educator ■ Counselor ■ Speech & Language Pathologist ■ Audiologist

Teaching and Training

Preschool Teacher ■ Kindergarten Teacher ■ Elementary Teacher ■ Secondary Teacher ■ Special Education Teacher ■ Teacher Aid ■ College & University Lecturer ■ Professor ■ Physical Trainer ■ Coach ■ Child Care Director ■ Child Care Worker ■ Child Life Specialist ■ Nanny ■ Early Childhood Teacher & Assistant ■ Group Worker & Assistant ■ Human Resource Trainer



Finance careers involve the management and use of money. The career pathways in this cluster include financial and investment planning, business financial management, banking, and insurance. Strong interpersonal and communication skills are key qualities for these workers.

Financial and investment planners help individuals and businesses make wise investment decisions. Business financial managers analyze and prepare financial reports. Jobs in banking and related services range from bank tellers to loan officers to credit analysts. People who work with insurance services help individuals and businesses protect themselves from financial losses.

Careers in finance exist in all parts of the economy. Some of the most desirable

finance jobs are in sales and stock trading. Trading can be very stressful and requires a thorough knowledge of markets and financial instruments. Although it can be difficult to get started in this business, the rewards are high to a person with great sales skills.

Employment opportunities in finance will likely be steady in the foreseeable future. Some entry-level finance positions are available to those with a high school diploma and strong math and communication skills. A four-year college degree or advanced training is required for most of the careers in this cluster. Many require special certifications beyond a college degree. Earnings in this cluster vary significantly depending on the occupation.





Pathways and Career Options

Financial and Investment Planning

Personal Financial Advisor ■
 Tax Preparation Professional ■
 Securities & Commodities Sales Agent ■
 Investment Advisor ■
 Brokerage Clerk ■
 Brokerage Assistant ■
 Development Officer

Business Financial Management

Accountant ■
 Financial Analyst ■
 Treasurers, Controllers & Chief Revenue Agent ■
 Auditor ■
 Economist ■
 Tax Examiner ■
 Collector ■
 Revenue Agent

Banking and Related Services

Credit Analyst ■
 Loan Officer ■
 Bill & Account Collector ■
 Teller ■
 Loan Processor ■
 Customer Service Representative ■
 Data Processor ■
 Accountant ■
 Internal Auditor ■
 Compliance Officer ■
 Debt Counselor ■
 Title Researcher & Examiner ■
 Abstractor ■
 Credit Report Provider ■
 Repossession Agent ■
 Network Service & Operations Manager

Insurance Services

Claims Agent, Examiner, & Investigator ■
 Claims Clerk ■
 Insurance Appraiser ■
 Underwriter ■
 Actuary ■
 Sales Agent ■
 Customer Service Agent ■
 Processing Clerk ■
 Direct Marketing



Government & Public Administration

This career area involves working in a government position or on issues related to government matters. Seven pathways make up this cluster. They include governance, national security, foreign service, planning, revenue and taxation, regulation, and public management and administration. Places of work range from nonprofit organizations to overseas locations to local, state, or federal governments.

People enter government and public service for a variety of reasons. Some want to help shape environmental regulations or public or foreign policy. Others desire to serve the president or protect national security for the Department of Defense. Yet others make social, economic, and environmental decisions as they help plan communities, highways, airports, and other public spaces. Those who work with

revenue and taxes make sure that citizens and businesses pay their taxes. They also review tax returns and collect overdue taxes. People who work in the regulatory industry help protect peoples' health and safety by making sure that industries and businesses follow the law. Managers and administrators who handle public resources must have strong technical skills in budgeting and managing personnel.

The training and education needed to enter a career in this cluster range from on-the-job training to advanced college degrees. Government job opportunities exist in every career area, and employment opportunities in state and local governments are increasing. This is due to population changes and a growing demand for public services.

Pathways and Career Options

Governance

President ■ Vice President ■ Governor ■ Lieutenant Governor ■ Mayor ■ Cabinet Level Secretary (Federal or State) ■ Representative (Federal or State) ■ Senator (Federal or State) ■ Assistant, Deputy, & Chief of Staff ■ Commissioner (County, Parish, or City) ■ Commissioner (State Agency) ■ Congressional Aide ■ Legislative Aide ■ Legislative Assistant ■ Specialist ■ Lobbyist ■ Policy Advisor

National Security

National Security Advisor ■ Staff or Field Officer ■ Electronic Warfare Specialist ■ Combat Operations Officer ■ Infantry Field Officer ■ Artillery Officer ■ Air Defense Artillery Officer ■ Special Forces Officer ■ Nuclear Weapons Officer & Specialist ■ Missile & Space Systems Officer ■ Military Intelligence Specialist ■ Signals Intelligence Officer ■ Surface Ship Warfare Officer ■ Submarine Officer ■ Combat Control Officer ■ Combat Engineer ■ Combat Aircraft Pilot & Crew ■ Airborne Warning Control Specialist ■ Intelligence & Counterintelligence Agent or Specialist ■ Intelligence Analyst ■ Cryptographer

Foreign Service

Ambassador Foreign Service Officer ■ Consular Officer ■ Administrative Officer ■ Political Officer ■ Economic Officer ■ Diplomatic Courier



Planning

Business Enterprise Official
 ■ Chief of Vital Statistics ■
 Commissioner ■ Director
 (Various Agencies) ■ Economic
 Development Coordinator ■
 Federal Aid Coordinator ■
 Census Clerk ■ County Director
 ■ Census Enumerator ■ Census
 Planner ■ Program Associate
 ■ Global Imaging Systems
 Specialist

Revenue and Taxation

Assessor ■ Tax Auditor ■
 Internal Revenue Investigator
 ■ Revenue Agent & Officer
 ■ Tax Examiner Assistant or
 Clerk ■ Inspector General ■ Tax
 Attorney ■ Tax Policy Analyst

Regulation

Business Regulation
 Investigator ■ Chief of Field
 Operations ■ Code Inspector
 or Officer ■ Equal Opportunity
 Officer, Inspector, Investigator,
 or Examiner ■ Chief Bank
 Examiner ■ Bank Examiner
 ■ Aviation Safety Officer ■
 Border Inspector ■ Cargo
 Inspector ■ Election Supervisor
 ■ Enforcement Specialist ■
 Immigration Officer

Public Management and Administration

City Manager ■ City Council
 Member ■ City or County Clerk
 ■ Court Administrator or Clerk ■
 Executive or Associate Director
 ■ Officer ■ General Service
 Officer ■ Management Analysis
 Officer ■ Program Administra-
 tion Officer



Health care is the fastest-growing industry in the United States, so careers in this cluster are in high demand. The career pathways include therapeutic and diagnostic services, health information, support services, and biotechnology research and development.

People who work in health sciences have a variety of responsibilities. Those in therapeutic services—physical therapists, doctors, nurses, and others—provide care and treatment through direct patient contact. People who work in diagnostic services help detect, diagnose, and treat diseases or injuries. Those who manage medical data and patient information need strong computer-science skills. Workers in support services, such as dietary technicians or hospital maintenance engineers, create a

healthful environment for health services. Scientists in biotechnology study ways to diagnose and treat human diseases.

The rapid growth of health-science technology and a quickly aging population are leading to a high demand for health-science workers. Entry-level jobs in health information require on-the-job training or certification. Most other careers in this cluster require a four-year-college degree or advanced college degree. Some also require a license or certification.

About half of all health-science workers find employment at hospitals. Many others find work at clinics, pharmacies, nursing homes, public health agencies, and private offices. Researchers in biotechnology find work at universities, government agencies, or major health organizations.

Pathways and Career Options

Therapeutic Services

Acupuncturist ■ Anesthesiologist
 Assistant ■ Art, Music, or Dance
 Therapist ■ Athletic Trainer ■
 Audiologist ■ Certified Nursing
 Assistant ■ Chiropractor ■ Dentist ■
 Hygienist ■ Dietician ■ Emergency
 Medical Technician ■ Home
 Health Aide ■ Licensed Practical
 Nurse ■ Massage Therapist ■
 Medical Assistant ■ Mortician ■
 Occupational Therapist or Assistant
 ■ Optometrist ■ Paramedic ■
 Pharmacist ■ Pharmacy Technician
 ■ Physical Therapist or Assistant ■
 Physician ■ Physician's Assistant
 ■ Psychologist ■ Registered Nurse
 ■ Respiratory Therapist ■ Social
 Worker ■ Speech & Language
 Pathologist ■ Veterinarian





Diagnostics Services

Cardiovascular Technologist
 ■ Clinical Lab Technician ■
 Computer Tomography (CT)
 Technologist ■ Cytotechnologist ■
 Diagnostic Medical Sonographer
 ■ Electrocardiographic (ECG)
 Technician ■ Electronic Diagnostic
 (EEG) Technologist ■ Exercise
 Physiologist ■ Geneticist ■
 Histotechnician ■ Histotechnologist
 ■ Magnetic Resonance (MR)
 Technologist ■ Mammographer ■
 Pathologist ■ Pathology Assistant
 ■ Phlebotomist ■ Medical
 Technologist ■ Clinical Laboratory
 Scientist ■ Nuclear Medicine
 Technologist ■ Positron Emission
 Tomography (PET) Technologist
 ■ Radiologic Technologist ■
 Radiographer ■ Radiologist

Health Informatics

Admitting Clerk ■ Applied
 Researcher ■ Community
 Services Specialist ■ Data
 Analyst ■ Epidemiologist ■
 Ethicist ■ Health Educator ■
 Health Information Coder ■
 Health Information Services
 ■ Healthcare Administrator ■
 Medical Assistant ■ Medical
 Biller ■ Patient Financial
 Services Coordinator ■ Medical
 Information Technologist
 ■ Medical Librarian &
 Cybrarian ■ Patient Advocate
 ■ Public Health Educator ■
 Reimbursement Specialist ■
 Social Worker ■ Transcriptionist
 ■ Unit Coordinator ■ Utilization
 Manager

Support Services

Biomedical Engineer ■ Clinical
 Engineer ■ Biomedical
 Technician ■ Clinical Technician
 ■ Environmental Services
 Worker ■ Facilities Manager ■
 Food Service Worker ■ Hospital
 Maintenance Engineer ■
 Industrial Hygienist ■ Materials
 Manager ■ Transport Technician

Biotechnology Research and Development

Biochemist ■ Bioinformatics
 Associate ■ Bioinformatics
 Scientist ■ Bioinformatics Spe-
 cialist ■ Biomedical Chemist ■
 Biostatistician ■ Cell Biologist ■
 Clinical Trials Research Associ-
 ate ■ Clinical Trials Research
 Coordinator ■ Geneticist ■
 Genetics Lab Assistant ■ Lab
 Technician ■ Microbiologist ■
 Molecular Biologist ■ Phar-
 maceutical Scientist ■ Quality
 Assurance Technician ■ Quality
 Control Technician ■ Regulatory
 Affairs Specialist ■ Research
 Assistant ■ Research Associ-
 ate ■ Research Scientist ■
 Toxicologist



Hospitality & Tourism

With increasing leisure time and personal income, many people have more resources for eating out, travel, and recreation. Career options in the area of hospitality and tourism focus on food and beverage services, lodging services, travel, and all types of recreation. Those who work in this industry must have exceptional customer-service skills. They like demanding and diverse work. These workers must also have a solid foundation in math, science, and technical skills.

Chefs prepare and serve food with the help of cooks, servers, and hosts. Lodging managers—with the help of reservationists, bellhops, housekeepers, and front-desk clerks—check guests in and out, meet all their needs, and keep the hotel clean. Travel agents need strong organizational skills and sales abilities

to help people plan trips and make lodging and travel reservations. Recreation workers help guests enjoy amusement parks, museums, zoos, unfamiliar cities, and other recreation services.

Many jobs in hospitality and tourism require no specific education. Workers—such as front-desk clerks, housekeepers, and cooks—often receive on-the-job training. However, managers of large resorts, hotels, restaurants, and amusement parks usually complete a four-year college degree. Managers may also have advanced training and certifications. People can acquire education and training at high schools, technical institutes, and two-year or four-year colleges and universities.

The job outlook for hospitality and tourism careers remains steady. Wages may vary greatly depending on the area of the country and type of facility.





Pathways and Career Options

Restaurants and Food and Beverage Services

General Manager ■ Food & Beverage Manager ■ Kitchen Manager ■ Catering & Banquets Manager ■ Service Manager ■ Maitre'd ■ Restaurant Owner ■ Baker ■ Brewer ■ Caterer ■ Executive Chef ■ Cook ■ Pastry & Specialty Chef ■ Bartender ■ Restaurant Server ■ Host ■ Banquet Server ■ Cocktail Server ■ Banquet Set-Up Employee ■ Bus Person ■ Room Service Attendant ■ Kitchen Steward ■ Counter Server ■ Wine Steward

Lodging

Front Office Manager ■ Executive Housekeeper ■ Director of Sales & Marketing ■ Director of Human Resources ■ Director of Security ■ Contoller ■ Food & Beverage Director ■ General Manager ■ Quality Assurance Manager ■ Owner & Franchisee ■ Communications Supervisor ■ Front Desk Supervisor ■ Reservations Supervisor ■ Valet Attendant ■ Door Attendant ■ Laundry Supervisor ■ Room Supervisor ■ Laundry Attendant ■ Maintenance Worker ■ Bell Captain ■ Shift Supervisor ■ Sales Professional ■ Night Auditor ■ Front Desk Employee ■ Concierge ■ Guestroom Attendant ■ Van Driver

Travel and Tourism

Executive Director ■ Assistant Director ■ Director of Tourism Development ■ Director of Communications ■ Director of Visitor Services ■ Director of Sales ■ Director of Marketing & Advertising ■ Director of Volunteer Services ■ Events Manager ■ Sales Manager ■ Destination Manager ■ Convention Services Manager ■ Travel Agent ■ Event Planner ■ Meeting Planner ■ Special Events Producer ■ Tour & Travel Coordinator ■ Tourism Assistant ■ Tour Guide ■ Tourism Marketing Specialist ■ Transportation Specialist ■ Welcome Center Supervisor ■ Motor Coach Operator ■ Interpreter

Recreation, Amusements, and Attractions

Club Manager & Assistant Manager ■ Club Membership Developer ■ Parks & Gardens Safety & Security ■ Parks & Garden Ranger ■ Resort Trainer & Instructor ■ Gaming & Casino Manager ■ Gaming & Casino Dealer ■ Gaming & Casino Security & Safety ■ Fairs & Festival Facility Manager ■ Fairs & Festival Promotional Developer ■ Theme Parks & Amusement Parks Area Ride Operations Manager ■ Theme Parks & Amusement Parks Group Events Manager ■ Historical, Cultural, Architectural, or Ecological Site Guide or Exhibit Developer ■ Museum, Zoo, or Aquarium Animal Trainer & Handler



Careers in human services relate to family and human needs. If you like to help others, one of these careers may be for you. People who enter these careers often desire to protect, nurture, or provide a service for others in need. Career pathways include services in early childhood development, counseling and mental health, family and community, personal care, and consumer services.

In early childhood development, workers nurture, teach, and care for children. Counselors and other mental-health workers help people with family and personal problems, mental-health issues, and career-related decisions. Family and community services workers—such as social workers, grief counselors, and geriatric workers—help people with crises or other needs that impact daily

living. Personal care workers may help people enhance their appearances or develop fitness. Helping people make financial decisions, buy or sell real estate, or purchase quality insurance or consumer products are just a few contributions of those focused on consumer services.

Most positions in this cluster are growing faster than average. Some entry-level jobs may require a high school diploma and a few community college courses. Other careers may require two-year, four-year, or advanced college degrees. Many careers may require state licenses or certification. Strong communication skills combined with solid science and technology skills will benefit anyone seeking a career in human services.

Pathways and Career Options

Early Childhood Development and Services

- Childcare Facility Director ■
- Childcare Facility Assistant
- Director ■ Elementary School
- Counselor ■ Preschool Teacher
- Educator for Parents ■
- Nanny ■ Teachers' Assistant ■
- Childcare Assistant or Worker





Counseling and Mental Health Services

Clinical & Counseling Psychologist ■ Industrial-Organizational Psychologist ■ Sociologist ■ School Counselor ■ School Psychologist ■ Substance Abuse & Behavioral Disorder Counselor ■ Mental Health Counselor ■ Vocational Rehabilitation Counselor ■ Career Counselor ■ Employment Counselor ■ Residential Advisor ■ Marriage, Child, & Family Counselor

Family and Community Services

Community Service Director ■ Adult Day Care Coordinator ■ Volunteer Coordinator ■ Licensed Professional Counselor ■ Religious Leader ■ Religious Activities & Education Program Director ■ Human Services Worker ■ Social Services Worker ■ Vocational Rehabilitation Counselor ■ Employment Counselor ■ Career Counselor ■ Vocational Rehabilitation Service Worker ■ Leisure Activities Coordinator ■ Dietician ■ Geriatric Service Worker ■ Adult Day Care Worker ■ Residential Advisor ■ Emergency & Relief Worker ■ Community Food Service Worker ■ Community Housing Service Worker ■ Social & Human Services Assistant

Personal Care Services

Barber ■ Cosmetologist, Hairdresser, & Hairstylist ■ Shampooer ■ Nail Technician, Manicurist, & Pedicurist ■ Skin Care Specialist & Esthetician ■ Electrolysis Technician ■ Electrologist ■ Funeral Director ■ Mortician ■ Embalmer ■ Funeral Attendant ■ Personal & Home Care Aide ■ Companion ■ Spa Attendant ■ Personal Trainer ■ Massage Therapist

Consumer Services

Consumer Credit Counselor ■ Consumer Affairs Officer ■ Consumer Advocate ■ Certified Financial Planner ■ Insurance Representative ■ Small Business Owner ■ Banker ■ Real Estate Services Representative ■ Financial Advisor ■ Investment Broker ■ Employee Benefits Representative ■ Hospital Patient Accounts Representative ■ Customer Service Representative ■ Consumer Research Department Representative ■ Consumer Goods or Services Retailing Representative ■ Market Researcher ■ Account Executive ■ Sales Consultant ■ Event Specialist ■ Inside Sales Representative ■ Field Merchandising Representative ■ Buyer



Information Technology

Do you find the ever-changing world of computer technology fascinating? With work available in every segment of society, information technology (IT) careers are among those most in demand. The IT career pathways include network systems, information and support services, programming and software development, and interactive media.

Network specialists analyze, implement, and maintain computer systems critical to corporate business. They may devise systems by which employees in a worldwide company can view information at the same time. Information support workers implement computer systems and provide technical support to all users.

Programming and software developers must comprehend computer operating systems and

programming languages. They often work with cutting-edge technologies to meet the future IT needs of businesses and individuals. Web designers, animators, and graphic artists have one thing in common—they all work with interactive media. People in these careers design and produce interactive multimedia that meet a variety of needs from sales and marketing to entertainment.

Depending on the occupation, training and education can be obtained at some high schools, technical colleges, two-year colleges, and four-year colleges or universities. Because IT specialists must be well versed in all factors affecting their industry, continuing education is often a requirement beyond a college degree. In addition to computer skills, people in these careers need strong science, math, and communication skills.





Pathways and Career Options

Network Systems

Data Communications Analyst ■ Information Systems Administrator ■ Information Systems Operator ■ Information Technology Engineer ■ Technical Support Specialist ■ User Support Specialist ■ Telecommunications Network Technician ■ Network Administrator ■ Network Analyst ■ Network Engineer ■ Network Operations Analyst ■ Network Security Analyst ■ Network Transport Administrator ■ Systems Administrator ■ Systems Engineer ■ Lead PC Support Specialist ■ Systems Support Lead

Information Support and Services


Data Administrator ■ Data Analyst ■ Data Modeler ■ Database Administration Associate ■ Database Developer ■ Knowledge Architect ■ Systems Administrator ■ Technical Writer ■ Desktop Publisher ■ Instructional Designer ■ Online Publisher ■ Technical Support Analyst ■ Call Center Support Representative ■ Customer Service Representative ■ Product Support Engineer ■ Sales Support Technician ■ Systems Analyst ■ Technical Support Engineer ■ Testing Engineer ■ Application Integrator ■ Business Continuity Analyst ■ Cross-Enterprise Integrator ■ Data Systems Designer ■ E-Business Specialist ■ Electronic Transactions Implementer ■ Information Systems Architect

Interactive Media

2D & 3D Artist ■ Animator ■ Audio & Video Engineer ■ Media Specialist ■ Media Designer ■ Instructional Designer ■ Multimedia Author ■ Multimedia Developer ■ Multimedia Specialist ■ Producer ■ Production Assistant ■ Programmer ■ Streaming Media Specialist ■ Virtual Reality Specialist ■ Web Designer ■ Web Administrator ■ Web Page Developer ■ Web Site Developer ■ Webmaster

Programming and Software Development

Applications Analyst ■ Applications Engineer ■ Business Analyst ■ Computer Engineer ■ Data Modeler ■ Operating Systems Designer & Engineer ■ Operating Systems Programmer ■ Operating Systems Analyst ■ Program Manager ■ Programmer ■ Analyst ■ Software Applications Specialist ■ Software Applications Architect ■ Software Applications Design Engineer ■ Software Applications Development Engineer ■ Quality Assurance (QA) Specialist ■ Software Applications Tester ■ Systems Analyst ■ Systems Administrator ■ Test Engineer



Law, Public Safety, Corrections & Security

With strong interest in public safety and national security, careers in law, public safety, and corrections, are increasingly in demand. Keeping citizens and the country safe is the core mission of this career area. Career pathways include working in corrections, emergency and fire management, security and protection, law enforcement, and legal services.

Careers range from probation officers to firefighters to criminal investigators and lawyers. Corrections workers have the responsibility to watch over those under arrest, awaiting trial, and serving time for crimes committed. Firefighters, emergency medical technicians, and other emergency workers keep citizens safe during all types of disasters. Often they are first on the scene to give help and treatment.

Security and protective services workers may check credentials and inspect packages of people entering or leaving businesses. Police officers and other workers protect citizens and their property by enforcing laws, investigating crimes and accidents, and arresting criminals. While adhering to a strict code of ethics, legal services personnel—such as judges, lawyers, and paralegals—uphold the legal system, which impacts all aspects of American life.

U.S. citizenship and no felony convictions are the basic requirements of most jobs in this career area. Some jobs require a high school diploma and work experience. Others require formal training, such as at fire-fighting or police academies, plus two-year or four-year college degrees or law degrees. Some careers require passing written exams or tests of physical strength and endurance.

Pathways and Career Options

Correction Services

Warden ■ Jail Administrator ■
Mid-level Manager ■ Program
Coordinator & Counselor ■
Public Information Officer
■ Correctional Trainer ■
Case Manager ■ Community
Corrections Practitioner ■
Probation & Parole Officer
■ Corrections Educator ■
Corrections Officer ■ Detention
Deputy ■ Support Staff ■
Youth Services Worker ■
Facility Maintenance Worker
■ Transport Officer ■ Food
Service Staff ■ Medical Staff ■
Dietitian





Emergency and Fire Management Services

Emergency Management & Response Coordinator ■
 Emergency Planning Manager ■
 Emergency Medical Technician ■
 Firefighter ■ Manager & Supervisor ■
 Rescue Worker ■
 Manager & Supervisor ■
 Forest Fire Inspector & Investigator ■
 Hazardous Materials Responder ■
 Dispatcher ■
 Training Officer ■
 Grant Writer & Coordinator

Security and Protective Services

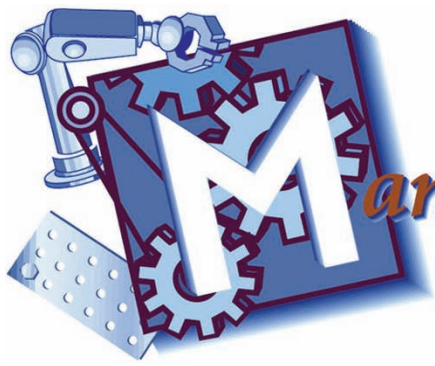
Security Director ■
 Security Systems Designer & Consultant ■
 Information Systems Security Specialist ■
 Computer Forensics Specialist ■
 Private & Corporate Investigator ■
 Loss Prevention & Security Manager ■
 Security Trainer & Educator ■
 Security Sales Representative ■
 Loss Prevention Specialist ■
 Life Guard ■
 Ski Patrol Officer ■
 Security Systems Technician ■
 Private Investigative Assistant ■
 Security Sales Assistant ■
 Transportation Security Supervisor ■
 Executive Protection Officer ■
 Certified Security Officer ■
 Armored Car Guard ■
 Control Center Operator ■
 Uniformed Security Officer ■
 Security Clerk ■
 Transportation Security Technician

Law Enforcement Services

Animal Control Officer ■
 Bailiff ■
 Child Support Investigator ■
 Missing Persons Investigator ■
 Unemployment Fraud Investigator ■
 Criminal Investigator & Special Agent ■
 Gaming Investigator ■
 Bomb Technician ■
 Highway Patrol ■
 Immigration & Customs Inspector ■
 Police & Detective Manager & Supervisor ■
 Police Detective & Criminal Investigator ■
 Police, Fire, & Ambulance Dispatcher ■
 Police & Patrol Officers ■
 Private Detectives & Investigator ■
 Sheriff ■
 Deputy Sheriff ■
 Training Officer ■
 Transit & Railroad Police ■
 Park Ranger ■
 Evidence Technician ■
 Federal Marshall

Legal Services

Attorney ■
 Case Management Specialist ■
 Court Reporter ■
 File & Document Manager ■
 Information Officer ■
 Investigator ■
 Judge ■
 Law Clerk ■
 Legal Assistant ■
 Legal Secretary ■
 Magistrate Mediator & Arbitrator ■
 Negotiator ■
 Paralegal



Manufacturing

Careers in the manufacturing cluster involve skills in planning, managing, and making raw materials into quality products. The cluster pathways involve production, process development, and equipment maintenance and installation, inventory control. They also include quality, health, safety, and environmental assurance.

Production workers use machinery and tools to assemble everything from electronics to modular homes. Design engineers and production managers work with product design and the overall manufacturing process to make quality products. Equipment technicians perform emergency repairs and also do routine maintenance on equipment, machines, and tools. Quality assurance workers make sure products and services meet customer standards.

People who work with **logistics**—the handling of operational details—and inventory control oversee all aspects of production from delivering raw materials to shipping products. Environmental and safety engineers focus on the safe use of equipment and a safe and healthy work environment.

The job outlook in manufacturing will grow faster than average especially for people with broad skills. Some careers, such as those in quality control, may see a decline as automation increases. Skilled jobs, such as machinists and welders, are usually learned through apprenticeships or at technical schools or two-year community colleges. Engineers, scientists, and production managers need at least a four-year degree. Some careers require special licenses or certification in addition to education and training.

Pathways and Career Options

Production

Assembler ■ Automated Manufacturing Technician ■ Bookbinder ■ Calibration Technician ■ Electrical Installer & Repairer ■ Extruding & Drawing Machine Setter ■ Extrusion Machine Operator ■ Foundry Worker ■ Grinding, Lapping, & Buffing Machine Operator ■ Hoist & Winch Operator ■ Instrument Maker ■ Large Printing Press Machine Setter ■ Milling Machine Set-Up Operator ■ Millwright ■ Tool & Die Maker ■ Welder ■ Tender & Cutter ■ Painter ■ Pattern & Model Maker ■ Precision Layout Worker ■ Production Associate ■ Sheet Metal Worker ■ Solderer & Brazier

Manufacturing Production Process Development

Design Engineer ■ Electrical & Electronic Technician & Technologist ■ Electronics Engineer ■ Engineering Technician & Technologist ■ Engineering Technician ■ Industrial Engineer ■ Labor Relations Manager ■ Manufacturing Engineer ■ Manufacturing Technician ■ Power Generating & Reactor Plant Operator ■ Precision Inspector, Tester, & Grader ■ Process Improvement Technician ■ Production Manager ■ Purchasing Agent ■ Supervisor



Maintenance, Installation, and Repair

Biomedical Equipment Technician
 ■ Boilermaker ■ Communication System Installer & Repairer ■ Computer Installer & Repairer ■ Computer Maintenance Technician ■ Electrical Equipment Installer & Repairer ■ Facility Electrician ■ Industrial Facilities Manager ■ Industrial Machinery Mechanic ■ Industrial Maintenance Electrician ■ Industrial Maintenance Technician ■ Instrument Calibrator & Repairer ■ Instrument Control Technician ■ Fixture Designer ■ Laser Systems Technician ■ Major Appliance Repairer ■ Meter Installer & Repairer ■ Millwright ■ Plumber, Pipe Fitter & Steam Fitter ■ Security System Installer & Repairer

Quality Assurance

Calibration Technician ■ Inspector ■ Lab Technician ■ Process Control Technician ■ Quality Control Technician ■ Quality Engineer ■ Statistical Process Control (SPC) Coordinator

Logistics and Inventory Control

Communications, Transportation, & Utilities Manager ■ Dispatcher ■ Freight, Stock, & Material Mover ■ Industrial Truck & Tractor Operator ■ Logistical Engineer ■ Logistician ■ Material Associate ■ Material Handler ■ Traffic, Shipping, & Receiving Clerk ■ Material Mover ■ Process Improvement Technician ■ Quality Control Technician ■ Traffic Manager

Health, Safety, and Environmental Assurance

Environmental Engineer ■ Environmental Specialist ■ Health & Safety Representative ■ Safety Coordinator ■ Safety Engineer ■ Safety Team Leader ■ Safety Technician



If you crave variety and enjoy a fast-paced environment, a career in marketing, sales, and service may be perfect for you! Careers in this cluster include all the jobs involved in buying, distributing, marketing, and selling products, and providing follow-up service to customers. Related jobs include finding new customers and tracking marketing data.

Managers and entrepreneurs direct the advertising, marketing, sales, and public relations for small businesses or major companies. Specialists in sales and marketing move goods and services to businesses and individuals. Merchandise managers and buyers predict trends and buy merchandise accordingly. Sales associates and store managers focus on selling and providing customer service.

Developing strategies to promote goods and services are key to those who work in marketing

and promotions. Market researchers gather information about consumer needs and use it to predict and plan new products. A logistics engineer often works closely with a warehouse manager to control the movement and storage of raw materials and finished goods. Specialists handle **e-marketing**, which is the use of computer technology to market goods and services.

The overall demand for employees in this cluster remains high. Those with computer skills and college degrees will have more opportunities in management. Many entry-level jobs exist in sales. However, employment opportunities are greater for those who attend community colleges or technical schools that offer one-, two-, or three-year programs, or colleges and universities that offer four-year degrees. Wages vary by occupation, level of responsibility, and work experience.

Pathways and Career Options

Management and Entrepreneurship

Entrepreneur ■ Owner ■ Small Business Owner ■ President ■ Chief Executive Officer ■ Principal ■ Partner ■ Proprietor ■ Franchisee ■ Administrative Support Representative ■ Independent Distributor

Professional Sales and Marketing

Inbound Call Manager ■ Channel Sales Manager ■ Regional Sales Manager ■ Client Relationship Manager ■ Business Development Manager ■ Territory Representative ■ Key Account Manager ■ National Account Manager ■ Account Executive ■ Sales Engineer ■ Sales Executive ■ Technical Sales Specialist ■ Retail Sales Specialist ■ Outside Sales Representative ■ Industrial Sales Representative ■ Manufacturer's Representative ■ Telemarketer ■ Customer Service Representative ■ Field Representative ■ Broker ■ Agent ■ Solutions Advisor ■ Sales & Marketing Associate

Buying and Merchandising

Store Manager ■ Retail Marketing Coordinator ■ Merchandising Manager ■ Merchandise Buyer ■ Operations Manager ■ Visual Merchandise Manager ■ Sales Associate ■ Stock Clerk ■ Receiving Clerk ■ Sales Manager ■ Department Manager



Marketing Communications and Promotion

Advertising Manager ■ Public Relations Manager ■ Public Information Director ■ Sales Promotion Manager ■ Co-op Manager ■ Trade Show Manager ■ Circulation Manager ■ Promotions Manager ■ Art & Graphics Director ■ Creative Director ■ Account Executive ■ Account Supervisor ■ Sales Representative ■ Marketing Associate ■ Media Buyer & Planner ■ Interactive Media Specialist ■ Contract Administrator ■ Copywriter ■ Research Specialist ■ Research Assistant

Marketing Information Management and Research

Database Manager ■ Research Specialist & Manager ■ Brand Manager ■ Marketing Services Manager ■ Customer Satisfaction Manager ■ Research Project Manager ■ Constituent Relationship Management (CRM) Manager ■ Forecasting Manager ■ Strategic Planner ■ Product Planner ■ Planning Analyst ■ Director of Market Development ■ Database Analyst ■ Research Associate ■ Frequency Marketing Specialist ■ Knowledge Management Specialist ■ Interviewer

Distribution and Logistics

Warehouse Manager ■ Materials Manager ■ Traffic Manager ■ Logistics Manager ■ Transportation Manager ■ Inventory Manager ■ Shipping & Receiving Clerk ■ Logistics Analyst & Engineer ■ Distribution Coordinator ■ Shipping & Receiving Administrator

E-Marketing

Fulfillment Manager ■ E-Merchandising Manager ■ E-Commerce Director ■ Web Site Project Manager ■ Internet Project Director ■ Brand Manager ■ Forum Manager ■ Web Master ■ Web Designer ■ Interactive Media Specialist ■ Internet Sales Engineer ■ Site Architect ■ User Interface Designer ■ On-line Market Researcher ■ Copywriters ■ Designer ■ Account Supervisor ■ Customer Support Specialist



Science, Technology, Engineering & Mathematics

Workers in this cluster use math and the scientific process in laboratory and testing services, and also conduct research. Often their work leads to discoveries that have the potential to improve life. Careers in this cluster are available in two areas: science and mathematics or engineering and technology.

Careers in science and mathematics range from teacher to physicist to statistician to lab technician. Workers use science and math to deal with real-world issues, such as solving environmental problems or preventing certain health conditions.

Engineers and technologists often specialize in biotechnology or distinct areas of engineering—civil, electrical, mechanical, aerospace, or chemical engineering. They use scientific principles to design new machinery, build new roads and bridges, or develop systems to prevent pollution or reduce energy usage.

Some entry-level jobs require a two-year degree from a community college or technical institute. Most careers in this cluster, including entry-level lab technicians, require a four-year degree from a college or university. Advanced degrees are common among engineers, scientists, technologists, and mathematicians. Some careers require certification, too.

Because of the critical nature of work in this cluster, the employment outlook remains very strong. Scientists and mathematicians who learn to use equipment in industrial and government settings may have a competitive edge over other job seekers. The need for technologists and engineers will increase as technology advances and employers need to improve and update product designs and manufacturing processes.





Pathways and Career Options

Engineering and Technology

Aerospace Engineer ■ Application Engineer ■ Automotive Engineer ■ Biotechnology Engineer ■ Chemical Engineer ■ Civil Engineer ■ Energy Transmission Engineer ■ Environmental Engineer ■ Facilities Technician ■ Geothermal Engineer ■ Hazardous Waste Technician ■ Human Factors Engineer ■ Industrial Engineering Technician ■ Licensing Engineer ■ Marine Engineer ■ Materials Engineer ■ Materials Lab & Supply Technician ■ Mechanical Engineer ■ Metallurgic Engineer ■ Mining Engineer ■ Nuclear Engineer ■ Operations Research Engineer ■ Packaging Engineer or Technician ■ Petroleum Engineer ■ Plastics Engineer

Science and Math

Research Chemist or Technician ■ Science Teacher ■ Lab Technician ■ Scientific Visualization & Graphics Expert ■ Statistician ■ Analytical Chemist ■ Anthropologist ■ Applied Mathematician ■ Archeologist ■ Astronomer ■ Astrophysicist ■ Atmospheric Scientist ■ Biologist ■ Botanist ■ Computer Aided Design (CAD) Operator ■ Cartographer ■ Chemist ■ Cosmologist ■ Demographer ■ Dye Chemist ■ Ecologist ■ Economist ■ Environmental Scientist ■ Geneticist ■ Geologist ■ Geophysicist ■ Geoscientist ■ Hydrologist ■ Inorganic Chemist ■ Mammalogist ■ Marine Scientist ■ Materials Analyst or Scientist ■ Mathematician ■ Metallurgist ■ Meteorologist



Transportation, Distribution & Logistics

Transportation by road, rail, water, and air offers many employment options. These careers focus on effective planning, efficient management, and safe movement of products and people. Related careers focus on planning, managing, and maintaining the equipment, facilities, and systems used.

Transportation workers, such as pilots and bus drivers, operate vehicles that transport freight and people. Others ensure safety, security, and timely delivery. Logistics and distribution employees plan and schedule transportation, shipment periods, and delivery dates. Workers in warehousing and distribution use cutting-edge tracking software to sort, label, and schedule customer deliveries. They also ensure accurately loaded shipments.

Some workers maintain, repair, and service transportation vehicles and the facilities that

house them. Traffic engineers may plan, manage, and regulate the basic framework of public transportation systems. Employees in health, safety, and environmental management conduct research and find ways to keep the environment safe and clean. Workers in sales and service sell transportation services to new customers and manage transportation needs of existing customers.

As one of the fastest growing segments of the economy, this career cluster offers many high-demand, high-wage work options. Many entry-level positions require on-the-job training or a special certificate (such as a Commercial Driver's License—CDL for truck drivers). Others require two-year or four-year degrees from a college or university. Entry-level positions for urban and regional planners often require an advanced degree.

Pathways and Career Options

Transportation Operations

Air & Space Transportation Manager ■ Airplane Pilot & Copilot ■ Flight Attendant ■ Air Traffic Controller ■ Aircraft Cargo Handling Supervisor ■ Rail Dispatcher ■ Locomotive Engineer ■ Railroad Brake, Signal, & Switch Operator ■ Train Crew Member ■ Yard Worker ■ Water Transportation Manager ■ Captain ■ Sailor & Marine ■ Ship & Boat Captain ■ Ship Engineer ■ Motorboat Operator ■ Bridge & Lock Tender ■ Truck, Bus, & Taxi Dispatcher ■ Truck Driver ■ Bus Driver ■ Taxi Driver ■ Bus Dispatcher ■ Subway & Streetcar Operator

Logistics Planning and Management Services

Logistician ■ Logistics Manager ■ Logistics Engineer ■ Logistics Analyst ■ Logistics Consultant ■ International Logistics Manager

Warehousing and Distribution Center Operations

Warehouse Manager ■ Storage & Distribution Manager ■ Industrial & Packaging Engineer ■ Traffic, Shipping, & Receiving Clerk ■ Production, Planning, & Expediting Clerk ■ First-Line Supervisor & Manager ■ Laborer & Material Mover ■ Machine & Vehicle Operator ■ Laborer & Freight Stock Material Mover ■ Car, Truck, & Ship Loader ■ Packer & Packager



Facility and Mobile Equipment Maintenance

Facility Maintenance Manager & Engineer ■ Industrial Equipment Mechanic ■ Industrial Electrician or Electronic Technician ■ Aerospace Engineering & Operations Technician ■ Aircraft Mechanic, Service Technician, or Engine Specialist ■ Power Plant Mechanic ■ Aircraft Body & Bonded Structure Repairer ■ Motorboat Mechanic ■ Ship Mechanic & Repairer ■ Rail Car Repairer & Mechanic ■ Signal & Track Switch Repairer ■ Motorcycle Mechanic ■ Automotive Body Repairer or Service Technician ■ Diesel Engine Specialist

Transportation System Infrastructure

Urban & Regional Planner ■ Civil Engineer ■ Engineering Technician ■ Surveying & Mapping Technician ■ Government Service Executive ■ Environmental Compliance Inspector ■ Air Traffic Controller ■ Aviation Inspector ■ Traffic Engineer ■ Traffic Technician ■ Motor Vehicle Inspector ■ Freight Inspector ■ Railroad Inspector ■ Marine Cargo Inspector ■ Vessel Traffic Control Specialists ■ Public Transportation Inspector ■ Government Agency Manager, Regulator, or Inspector

Health, Safety, and Environmental Management

Health & Safety Manager ■ Industrial Health & Safety Engineer ■ Environmental Scientist & Specialist ■ Environmental Science & Protection Technician ■ Environmental Manager & Engineer ■ Environmental Compliance Inspector ■ Safety Analyst

Sales and Service

Marketing Manager ■ Sales Manager ■ Sales Representative (Transportation & Logistics Services) ■ Reservation, Travel & Transportation Agent or Clerk ■ Customer Order & Billing Clerk ■ Cashier, Counter, or Rental Clerk ■ Cargo & Freight Agent ■ Customer Service Manager ■ Customer Service Representative

Education and Training Requirements

Often people are not aware of the educational requirements for various occupations. Having the education necessary to enter a profession of choice is highly important.

Jobs that do not require a degree or technical training after high school usually provide on-the-job training. Often, these are lower-paying positions that people use as stepping-stones to better jobs. See 13-3 for a list of the 10 most available jobs through 2016 for workers without a degree or technical training.

Many jobs require at least an **associate degree**. This is a two-year college degree. Sometimes students take a two-year program to jumpstart a career. Once working, they seek additional education and training. See 13-4 for a list of the 10 most available jobs through 2016 for those with an associate degree.

About 20 percent of jobs may require at least a four-year degree, or a **bachelor's degree**. The belief that everyone needs a bachelor's degree is simply not true. These jobs are usually higher paying than those requiring less education. See 13-5 for a list of the 10 most available jobs through 2016 for individuals with a bachelor's degree.

By examining the career clusters and the information that accompanies them, you can learn to identify occupations that offer good job prospects. Look for occupations that are in high demand or are growing. Also, notice which occupations show declining numbers. If you choose a career in such a field, recognize that finding work may be more challenging.

Thinking It Through

Why do so many people believe the misconception that everyone needs a bachelor's degree?

13-3

The jobs that do not require a degree or specialized training are usually lower-paying positions.

Future Occupational Trends

What are the jobs of the future? No one knows for sure, but researchers continue to study **occupational trends**. These are research predictions regarding the jobs that will most likely be needed in the future.

Top 10 Jobs Through 2016 That Do Not Require a Degree	
Occupations	Total Job Openings
Retail salespersons	5,034,000
Office clerks, general	3,604,000
Cashiers (except gaming)	3,382,000
Combined food preparation and serving workers (including fast-food)	2,955,000
Customer service representatives	2,747,000
Janitors and cleaners (except maids and housekeeping cleaners)	2,732,000
Waiters and waitresses	2,615,000
Truck drivers—heavy and tractor-trailer	2,053,000
Nursing aides, orderlies, and attendants	1,711,000
Maids and housekeeping cleaners	1,656,000

Top 10 Jobs Through 2016 Requiring an Associate Degree	
Occupation	Total Job Openings
Registered nurses	3,092,000
Computer support specialists	624,000
Legal secretaries	308,000
Paralegals and legal assistants	291,000
Radiologic technologists and technicians	226,000
Dental hygienists	217,000
Medical records and health information technicians	200,000
Engineering and mapping technicians	192,000
Respiratory therapists	126,000
Veterinary technologists and technicians	100,000

U.S. Bureau of Labor Statistics

13-4

These jobs require a two-year college degree.

Top 10 Jobs Through 2016 Requiring a Bachelor's Degree	
Occupation	Total Job Openings
Elementary school teachers (except special education)	1,749,000
Accountants and auditors	1,500,000
All other business operations specialists	1,261,000
Secondary school teachers (except special and career/technical education)	1,096,000
All other teachers (primary, secondary, and adult)	805,000
Computer software engineers, applications	733,000
Computer systems analysts	650,000
Construction managers	564,000
Computer software engineers, systems software	449,000
Network systems and data communications analysts	402,000

U.S. Bureau of Labor Statistics

13-5

These higher-paying jobs require at least a bachelor's degree

One such trend is the ever-growing number of service-related jobs. These jobs are expected to account for most of the new jobs generated by 2016. The majority of new service positions will be in business, health, and social services.

Advances in technology and changes in society shape occupational trends. Some important societal changes that are shaping U.S. occupations include an aging population, increased concern over health and fitness, high interest in recreation and entertainment, and new ways of communicating based on new technologies.

All 16 career clusters are important sources of future jobs. You and your peers will likely work in 10 or more jobs for five or more employers before retirement. Some of the occupations you will hold may not exist today. This means it is your responsibility to manage your own career and watch for new opportunities.

Keep career flexibility in mind as you explore various occupations. Success in tomorrow's workplace will require self-reliant individuals who can easily adapt to change, transfer skills to new situations, and learn new skills.



Reflect Further

What additional technological and societal trends will likely impact careers of the future?

Summary

A good way to begin exploring careers is to think about factors that influence your options. These factors may include your interests, aptitudes, and abilities. Your values and goals are influences, too. When exploring careers, avoid placing limits on the types of occupations to consider. You are likely to work in several different occupations during your career.

Then explore the 16 career clusters and their pathways to learn about the wide range of jobs within each cluster pathway. You can identify specific jobs that interest you and examine them in more detail.

It is important to understand the trends that show growth or change in occupational areas. Areas of growth usually provide the most high-demand job opportunities. Occupations are available for people who have different levels of education and training, but the jobs that require more knowledge and skills usually pay better. Ultimately, each individual is responsible for choosing a suitable occupation and taking advantage of career-enhancing opportunities.

Facts in Review

1. What factors influence careers you choose from the career clusters?
2. List two myths related to nontraditional jobs—one for each gender.
3. Name at least six examples of careers in the arts, audio/video technology, and communications cluster.
4. List at least three skills all businesspeople need.
5. How do highly skilled educators use many of their nonteaching hours?
6. What skills do people need to build a foundation for a finance career?
7. Why are government career opportunities increasing?
8. Contrast the job responsibilities for health-science workers in therapeutic versus health information services.
9. Name six careers in the human services cluster.
10. In addition to computer skills, what key skills do workers in information technology careers need?
11. What are the basic requirements for most jobs in the law, public safety, corrections, and security career cluster?
12. Why will demand for scientists, technologists, and engineers increase?
13. What is the difference between an *associate* degree and a *bachelor's* degree?
14. What occupation in 2016 will offer the greatest number of jobs to people with no degree?

Developing Your Academic Skills

1. **English.** Use Internet and print resources to research the origins of traditional jobs. Identify which periods in history prompted a break from traditional roles in the workplace. Write a brief report summarizing your findings.
2. **Science.** Interview a science teacher about the importance of understanding science principles as they relate to various occupations. What skills are most important? Share your findings with the class in an oral report.

Information Technology Applications

1. Use presentation software to give a talk on a career of your choice. Incorporate photos into the presentation by scanning images or downloading them from the Internet. Clearly identify the source of each image by keying this line under each: *Photo courtesy of (name of group or organization).*
2. Search the Internet for the term *emerging occupations* and the occupations associated with this term. Write a brief summary indicating which emerging occupations were listed as most *in demand*.

Applying Your Knowledge and Skills

1. **Problem Solving and Critical Thinking.** Select a career that interests you and research the past employment opportunities that it presented. Cite examples of societal changes that have affected career opportunities in the last 10 years and plot these changes on a timeline.
2. **Employability and Career Development.** List at least five occupations from any of the career clusters that interest you. Then identify the school subjects and the knowledge and skills that relate to each job. Have you taken any of these subjects or do you plan to take them in the future? In what other ways could you prepare yourself for these jobs?
3. **Communications.** Choose one example of societal change discussed in this or a previous chapter. Write a report explaining the positive and negative aspects of that change on career opportunities.

Developing Workplace Skills

Conduct an in-depth study of the varied aspects of occupations related to your interest area. Select a preferred career and forecast a job profile 10 years from now by using information from the U.S. Bureau of Labor Statistics and the *Occupational Outlook Handbook*. (Both are accessed through www.bls.gov.) In your job profile, include information about how economic, technological, and societal trends may impact your career. Keep the profile in your personal career file for future reference.