



# Occupational employment

Growth of an occupation is closely tied to growth of the industries in which it is concentrated. For example, sewing machine operators are projected to decline in employment because of a decline in the apparel manufacturing industry.

Employment growth also depends on changes in an occupation's share of each industry's workforce. Because use of computer technology is increasing, for example, employment of computer engineers and computer systems analysts is projected to make up a larger share of the workforce in almost all industries and, therefore, is projected to grow at a faster rate than that of total employment in these industries. In contrast, computer technology will continue to reduce the need for typists, switchboard operators, and bookkeepers in most industries.

Business decisions to transfer job duties from one occupation to another also may affect occupational growth; this practice will accelerate employment growth of technicians and assistants, for example, while limiting that of lawyers, teachers, and physicians.

The Bureau analyzes these factors to project employment for more than 500 detailed occupations. To provide an understanding of broad occupational employment trends, the occupations are grouped in two ways: by type of work performed and by education and training usually required. Although some charts use the first classification scheme, most use the second. Data presented by education and training are better suited to career guidance.

## Classification by type of work performed

Traditionally, occupations have been sorted into nine major groups comparable to those of the Standard Occupational Classification (SOC), which categorizes occupations by the type of work performed. The occupational groups are:

- ◆ **Executive, administrative, and managerial.** These workers direct the activities of business, government, and other organizations. Examples include financial managers; school principals and other education administrators; hotel managers; and management support workers, such as loan officers and budget analysts, who provide technical assistance to managers.
- ◆ **Professional specialty.** Workers in this group provide a variety of services throughout the economy. Occupations within the category include engineers, computer systems analysts, lawyers, registered nurses, teachers, and social workers.
- ◆ **Technicians and related support.** People in this group

operate technical equipment and assist engineers, scientists, physicians, and other professional specialty workers. Examples include health technicians and technologists, engineering and science technicians, computer programmers, and paralegals.

- ◆ **Marketing and sales.** These workers sell goods and services and supervise sales work. Occupations include cashiers, travel agents, retail salespersons, and insurance sales agents.
- ◆ **Administrative support, including clerical.** Workers in this group prepare and record memos, letters, and reports; deal with the public; and gather and distribute goods and information. Examples include secretaries, receptionists, stock clerks, and mail carriers.
- ◆ **Service.** This group includes workers who attend to the public, such as police, cooks, nursing aides, cosmetologists, janitors, and child-care workers.
- ◆ **Agriculture, forestry, fishing, and related.** Most workers in this group perform tasks associated with plants and animals; the group includes farmers, landscaping and groundskeeping laborers, logging equipment operators, veterinary assistants, and animal caretakers.
- ◆ **Precision production, craft, and repair.** People in these occupations do highly skilled production work, primarily in manufacturing industries; construct, alter, and repair buildings, primarily in the construction industry; and adjust, maintain, and repair machinery. Examples include cabinetmakers, machinists, carpenters, and automotive mechanics.
- ◆ **Operators, fabricators, and laborers.** These workers operate production machinery and transportation equipment, assemble products, assist skilled workers, and perform various routine tasks. Occupations include packaging machine operators, truckdrivers, welders, and parking lot attendants.

## Classification by education and training required

The Bureau has developed a system to classify occupations based on the education or training most workers need to fully qualify for an occupation. In this system, occupations are classified in 1 of 11 categories. Seven of the 11 categories include occupations that require education beyond high school, ranging from postsecondary vocational training to a first professional degree. Four categories include occupations that can be learned through experience and on-the-job

training; these occupations are usually open to high school graduates and, in some cases, to those with less education.

The education and training categories are:

- ◆ **First professional degree.** Completion of a first professional degree usually requires at least 6 years of full-time equivalent academic study, including college study prior to entering the professional degree program.
- ◆ **Doctoral degree.** Completion of a doctoral degree program usually requires at least 3 years of full-time equivalent academic work beyond a bachelor's degree.
- ◆ **Master's degree.** Completion of a master's degree program usually requires 1 or 2 years of full-time equivalent study beyond a bachelor's degree.
- ◆ **Work experience, plus a bachelor's or higher degree.** Most occupations in this category are managerial.
- ◆ **Bachelor's degree.** Completion of a bachelor's degree program usually requires 4 or 5 years of full-time academic work.
- ◆ **Associate degree.** Completion of an associate degree program usually requires at least 2 years of full-time academic study.
- ◆ **Postsecondary vocational training.** Training may lead to a certificate or other award but not a degree. Some postsecondary vocational training programs last only a few weeks; others may last a year or more. Some occupations also require a licensing examination.
- ◆ **Work experience in a related occupation.** Occupations in this category require skills and experience gained in a related occupation or developed from hobbies, nonwork activities, or service in the Armed Forces. Most occupations are supervisory or managerial.
- ◆ **Long-term on-the-job training.** This category includes occupations that usually require more than 12 months of on-the-job training or combined work experience and formal classroom instruction, such as apprenticeships and employer-sponsored training. Individuals undergoing training are usually considered employed in the occupation.
- ◆ **Moderate-term on-the-job training.** Workers in these occupations develop skills they need after 1 to 12 months of combined on-the-job experience and informal training.
- ◆ **Short-term on-the-job training.** Workers in these occupations develop skills they need after a short demonstration of job duties or after 1 month or less of on-the-job experience or instruction.

## What are the best occupations?

Many criteria are used to determine job quality. Two of these criteria are measures of job outlook—employment growth by number and by percent—presented in this issue of the *Quarterly*. These charts focus on occupations projected to have the largest number of new jobs or the fastest rate of growth.

Because most people also find earnings levels significant, some charts include rankings for 1997 hourly earnings. The rankings are based on quartiles using one-fourth of total employment to define each quartile and are presented in four categories identified by dollar signs, with \$ indicating the range for the lowest quartile and \$\$\$\$ the range for the highest.

Opportunity to be one's own boss may also be an important factor for determining job quality. A chart provides information on occupations that had the most self-employed workers in 1998. The importance of other factors, such as the opportunity to help people, to express creativity, or to be physically mobile on the job, varies from one person to another. These characteristics are discussed in the *Handbook*. An article in the fall 1998 *Quarterly*, "Matching Yourself With the World of Work," provides a table that rates occupations by 22 characteristics. (For a reprint of the article, see the ordering information in the box on page 4.)

## Other job openings

Not all job openings depend on the amount of growth in an occupation. Some job openings result from the need to replace workers who enter other occupations or retire or leave the labor force for other reasons. Except for those in the professional specialty occupational group, the number of job openings resulting from replacement needs is greater than that of openings resulting from employment growth. Larger occupations usually have more openings from replacement needs, but even occupations projected to decline provide some job openings.

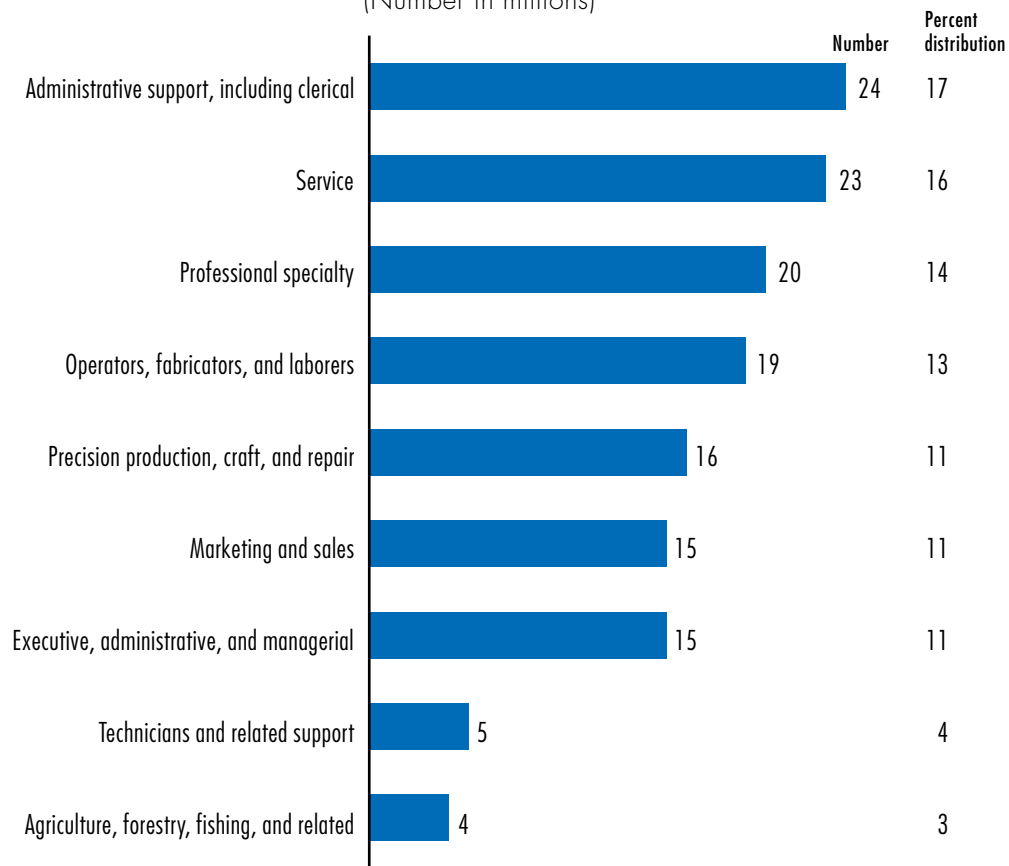
Data on job openings from replacement needs are not presented in these charts; however, they are presented in the 2000-01 *Occupational Projections and Training Data*; *Employment Outlook, 1998-2008*; and Douglas Braddock's article, "Occupational Employment Projections to 2008," in the November *Monthly Labor Review*. For ordering information, see the box on page 4.



The administrative support and service occupational groups, the largest in 1998, also were the largest in 1988 and are projected to remain so through 2008.

## Employment by major occupational group, 1998

(Number in millions)



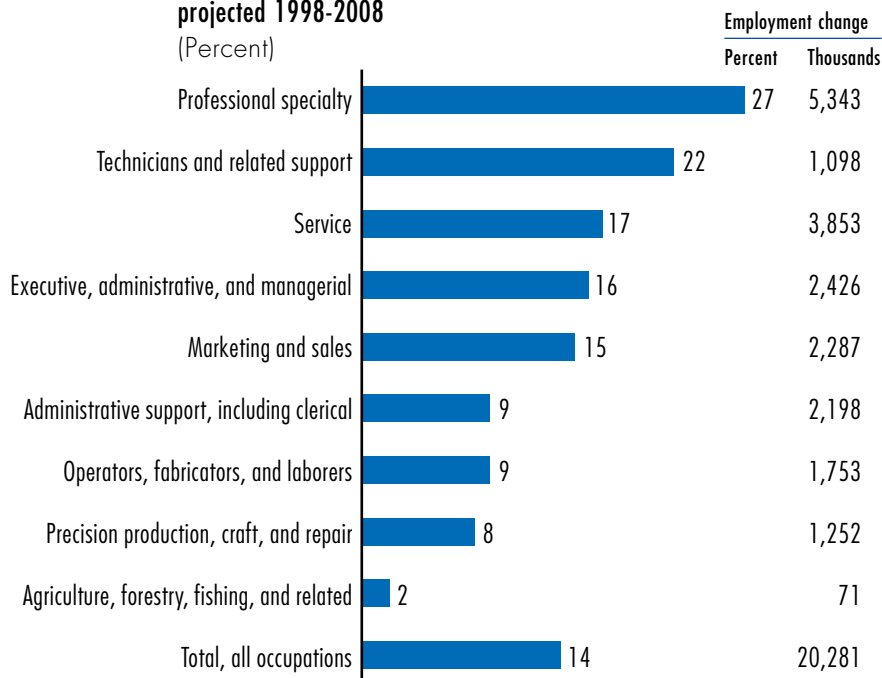
The professional specialty and service occupational groups should add the most new jobs, reflecting their rapid growth rates and relatively large sizes in 1998. The technicians occupational group ranks next to last in job growth despite a rapid growth rate because of its small size. However, administrative support creates many jobs despite slow growth because it is a very large occupational group.

**Employment growth by major occupational group, projected 1998-2008**  
(Number in thousands)



Employment in the professional specialty occupational group will grow fastest. Growth will be led by computer-related occupations, which are projected to nearly double in employment. Within the slow-growing precision production, craft, and repair group, repair occupations are projected to grow 11 percent and precision production occupations 1 percent. The disparity reflects overall patterns of little growth in the manufacturing industries in which the precision production occupations are concentrated.

**Employment growth by major occupational group, projected 1998-2008**  
(Percent)

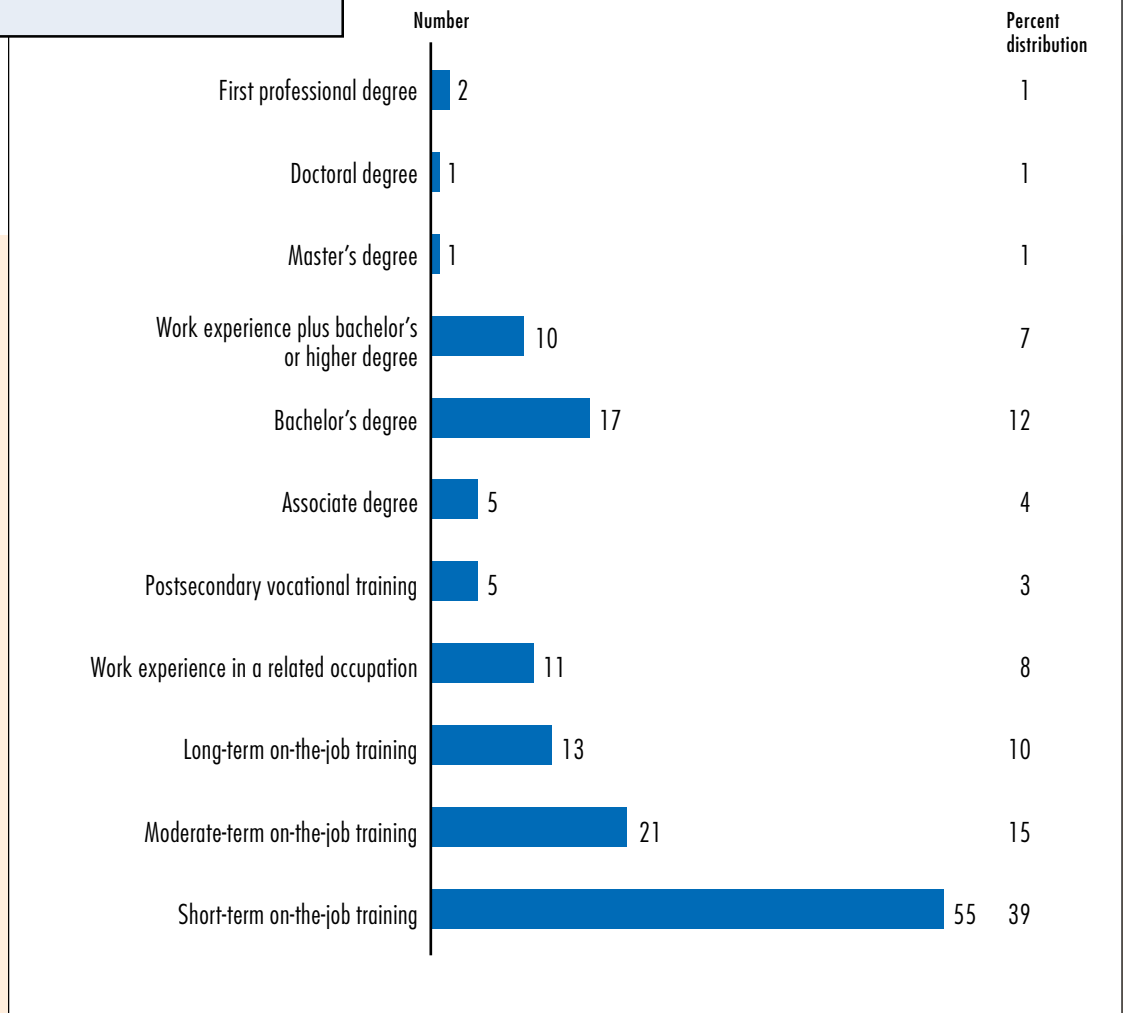




## Employment by education and training

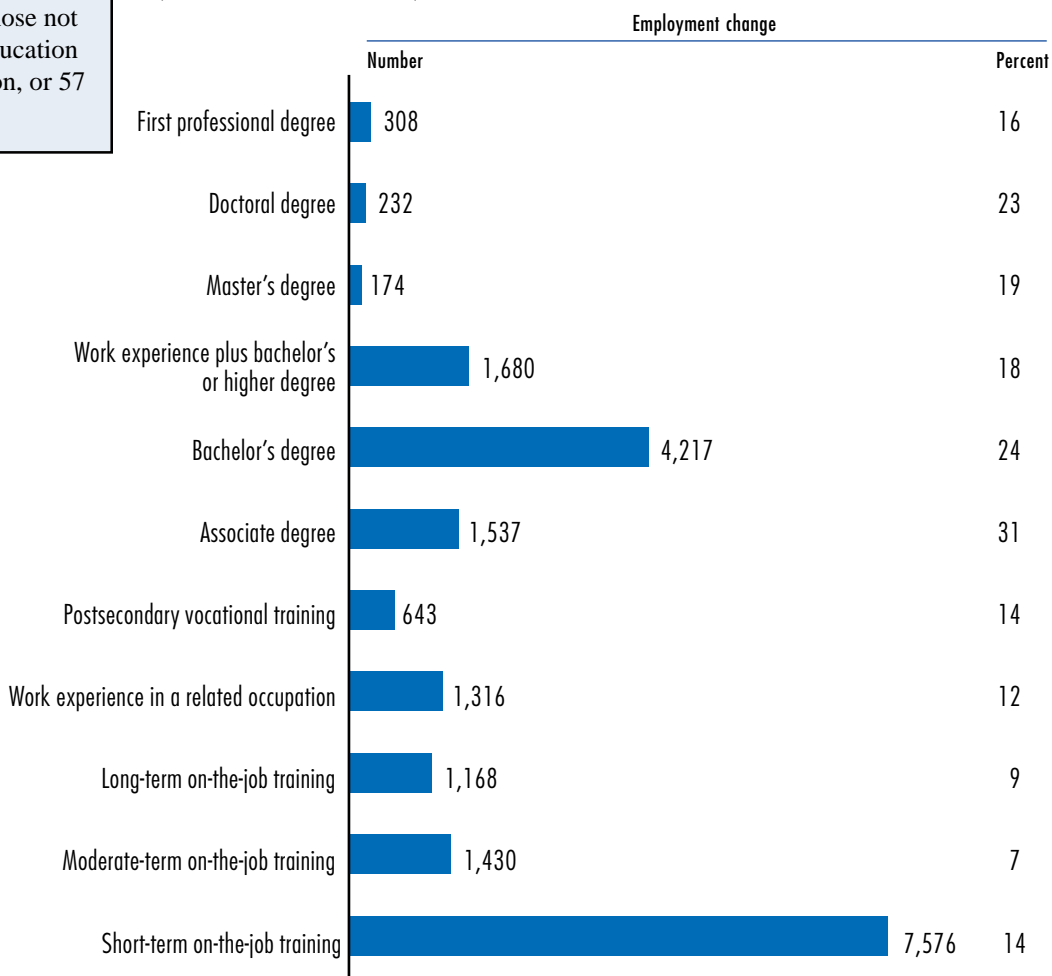
Occupations in the 5 categories that usually require a bachelor's degree or more education accounted for 31 million, or 22 percent, of all jobs in 1998. Occupations requiring an associate degree or postsecondary vocational training accounted for 10 million, or 7 percent, of all jobs. Occupations that usually require related work experience or on-the-job training accounted for 100 million, or 72 percent.

**Employment by education and training category, 1998**  
(Number in millions)



Occupations in the 5 categories that usually require a bachelor's degree or more education will account for 6.6 million new jobs—33 percent of all job growth. Occupations requiring an associate degree or postsecondary vocational training will account for 2.2 million, or 11 percent, of all new jobs. Those not requiring postsecondary education will account for 11.5 million, or 57 percent.

**Employment growth by education and training category, projected 1998-2008**  
(Number in thousands)



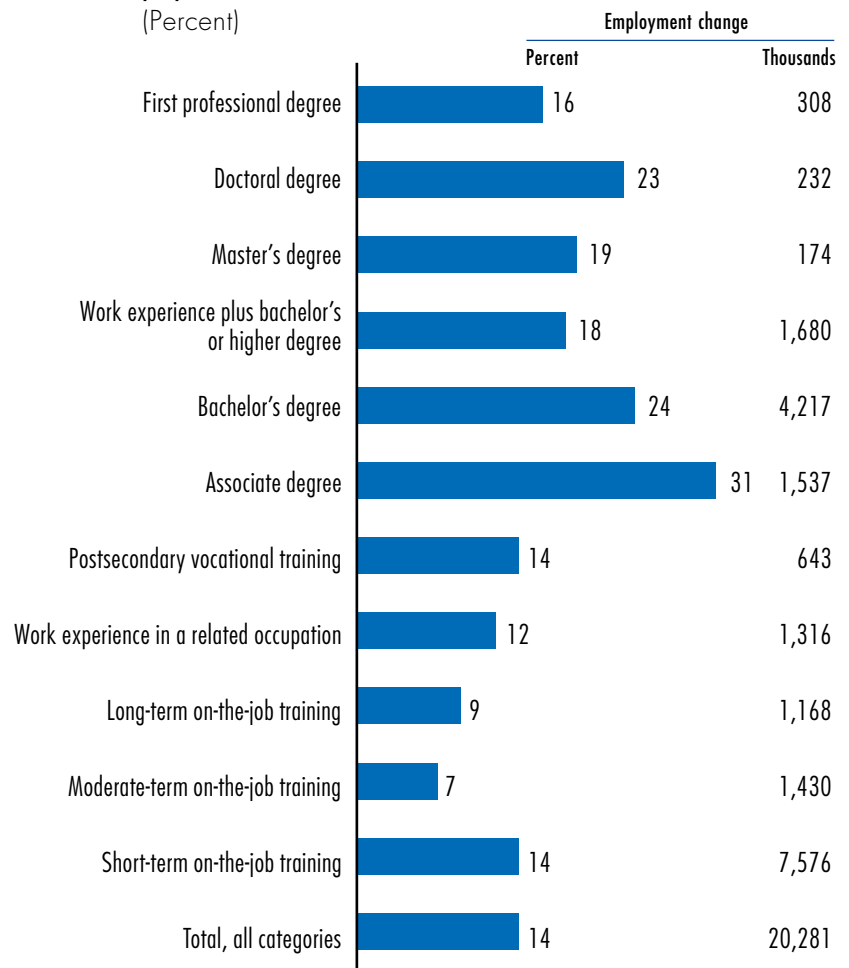


Education and training categories for occupations requiring an associate degree or more education will grow faster than average. The fastest growing education and training categories—for occupations requiring an associate degree and those requiring a bachelor's degree—include most of the rapidly growing health- and computer-related occupations. By 2008, the 5 categories usually requiring a bachelor's degree or more education will compose about the same proportion, 23 percent, of jobs they made up in 1998.

Education categories for occupations usually requiring related work experience or on-the-job training and a high school diploma or less formal education will grow more slowly than average and make up about 69 percent of the total. The moderate-term on-the-job training category should grow most slowly, in part because it includes many occupations concentrated in the overall little-changing manufacturing industries.

**Employment growth by education and training category, projected 1998-2008**

(Percent)



Most employment growth in these education and training categories will be in three large occupations—college and university faculty, physicians, and lawyers. Speech pathologists, biological scientists, and physical therapists are the fastest growing. Nearly all are in the top earnings quartile.

### Employment growth in selected occupations usually requiring a master's, doctoral, or first professional degree, projected 1998-2008

(Number in thousands)

	Employment change		Earnings quartile
	Number	Percent	
College and university faculty	195	23	\$\$\$\$
Physicians	122	21	\$\$\$\$
Lawyers	117	17	\$\$\$\$
Counselors	46	25	\$\$\$\$
Physical therapists	41	34	\$\$\$\$
Speech-language pathologists and audiologists	40	38	\$\$\$\$
Biological scientists	28	35	\$\$\$\$
Clergy	20	13	\$\$\$
Psychologists	19	11	\$\$\$\$
Veterinarians	14	25	\$\$\$\$
Pharmacists	14	7	\$\$\$\$
Chiropractors	11	23	\$\$\$\$
Medical scientists	8	25	\$\$\$\$
Librarians	7	5	\$\$\$\$
Operations research analysts	7	9	\$\$\$\$
Urban and regional planners	6	17	\$\$\$\$
Dentists	5	3	\$\$\$\$
Optometrists	4	11	\$\$\$\$
Archivists, curators, and conservators	3	13	\$\$\$
Podiatrists	1	11	\$\$\$\$





Computer engineers, computer systems analysts, residential counselors, and engineering, science, and computer systems managers are among the fastest growing occupations in these categories.

## Employment growth in selected occupations usually requiring a bachelor's degree or work experience plus a bachelor's or higher degree, projected 1998-2008

(Number in thousands)

	Employment change		Earnings quartile
	Number	Percent	
Computer systems analysts	577	94	\$\$\$\$
General managers and top executives	551	16	\$\$\$\$
Computer engineers	323	108	\$\$\$\$
Teachers, secondary school	322	23	\$\$\$\$
Social workers	218	36	\$\$\$
Teachers, elementary school	205	12	\$\$\$\$
Computer programmers	191	30	\$\$\$\$
Engineering, natural science, and computer systems managers	142	43	\$\$\$\$
Teachers, special education	137	34	\$\$\$\$
Securities and financial services sales agents	124	41	\$\$\$\$
Accountants and auditors	122	11	\$\$\$\$
Advertising, marketing, and public relations managers	112	23	\$\$\$\$
Management analysts	98	28	\$\$\$\$
Financial managers	97	14	\$\$\$\$
Electrical and electronics engineers	93	26	\$\$\$\$
Teachers, preschool	92	27	\$\$
Designers, except interior designers	91	27	\$\$\$
Residential counselors	88	46	\$\$
Writers and editors	83	24	\$\$\$\$
Artists and commercial artists	79	26	\$\$\$

The fastest growing occupations in these categories are computer support specialists, paralegals, and data processing equipment repairers.

### Employment growth in selected occupations usually requiring an associate degree or postsecondary vocational training, projected 1998-2008

(Number in thousands)

	Employment change		Earnings quartile
	Number	Percent	
Registered nurses	451	22	\$\$\$\$
Computer support specialists	439	102	\$\$\$\$
Licensed practical nurses	136	20	\$\$\$
Automotive mechanics and service technicians	132	17	\$\$\$
Paralegals and legal assistants	84	62	\$\$\$
Hairstylists and cosmetologists	62	10	\$
Dental hygienists	58	41	\$\$\$\$
Electrical and electronic technicians and technologists	56	17	\$\$\$\$
Emergency medical technicians	47	32	\$\$
Health information technicians	41	44	\$\$
Data processing equipment repairers	37	47	\$\$\$
Legal secretaries	37	13	\$\$\$
Respiratory therapists	37	43	\$\$\$
Physical therapy assistants and aides	36	44	\$\$
Radiologic technologists and technicians	32	20	\$\$\$
Medical secretaries	26	12	\$\$
Sales agents, real estate	26	9	\$\$\$
Travel agents	25	18	\$\$
Surgical technologists	23	42	\$\$\$
Drafters	18	6	\$\$\$



Correctional officers, sheriffs and deputy sheriffs, and police patrol officers are among the fastest growing occupations in these categories.

## Employment growth in selected occupations usually requiring related work experience or long-term on-the-job training, projected 1998-2008

(Number in thousands)

	Employment change		Earnings quartile
	Number	Percent	
Office and administrative support supervisors and managers	313	19	\$\$\$
Marketing and sales worker supervisors	263	10	\$\$\$
Blue-collar worker supervisors	196	9	\$\$\$\$
Correctional officers	148	39	\$\$\$
Cooks, restaurant	146	19	\$
Police patrol officers	141	32	\$\$\$\$
Food service and lodging managers	97	16	\$\$\$
Maintenance repairers, general utility	95	8	\$\$\$
Carpenters	74	7	\$\$\$
Electricians	68	10	\$\$\$\$
Telephone and cable TV line installers and repairers	55	30	\$\$\$
Heating, air conditioning, and refrigeration mechanics	48	17	\$\$\$
Teachers and instructors, vocational education	46	11	\$\$\$
Musicians, singers, and related workers	41	15	\$\$\$
Actors, directors, and producers	38	24	\$\$\$
Insurance adjusters, examiners, and investigators	37	20	\$\$\$\$
Automotive body and related repairers	36	16	\$\$\$
Instructors, adult (nonvocational) education	35	21	\$\$\$
Sheriffs and deputy sheriffs	31	34	\$\$\$
Welders and cutters	31	8	\$\$\$

The fastest growing occupations in these categories are personal care and home health aides, medical assistants, and social and human service assistants.

### Employment growth in selected occupations usually requiring short- or moderate-term on-the-job training, projected 1998-2008

(Number in thousands)

	Employment change		Earnings quartile
	Number	Percent	
Retail salespersons	563	14	\$
Cashiers	556	17	\$
Truckdrivers, except driver/sales workers	493	17	\$\$\$
Office clerks, general	463	15	\$\$
Personal care and home health aides	433	58	\$
Teacher assistants	375	31	\$
Janitors and cleaners	365	11	\$
Nursing aides and attendants	325	24	\$
Receptionists and information clerks	305	24	\$\$
Waiters and waitresses	303	15	\$
Guards	294	29	\$
Food counter and related workers	247	12	\$
Child-care workers, except private household	236	26	\$
Laborers, landscaping and groundskeeping	234	21	\$\$
Hand packers and packagers	213	22	\$
Adjustment clerks	163	34	\$\$
Medical assistants	146	58	\$\$
Social and human service assistants	141	53	\$\$
Stock clerks and order fillers	131	6	\$
Food preparation workers	131	10	\$



## Occupations gaining the largest number of jobs

These 20 occupations—out of about 500—are projected to add about 8 million jobs, 39 percent of all projected growth. Three are health-related occupations (designated by ★), and 3 are computer related (●). Three have below average growth rates. Nine are in the upper 2 of 4 earnings quartiles. Twelve require short-term on-the-job training, and 4 require a bachelor's degree or more education.

Four occupations also appear in the chart of fastest growing occupations:

- ◆ Computer systems analysts
- ◆ Computer support specialists
- ◆ Personal care and home health aides
- ◆ Computer engineers

### Employment growth in selected occupations, projected 1998-2008

(Number in thousands)

	Employment change		Earnings quartile
	Number	Percent	
● Computer systems analysts	577	94	\$\$\$\$
Retail salespersons	563	14	\$
Cashiers	556	17	\$
General managers and top executives	551	16	\$\$\$\$
Truckdrivers, except driver/sales workers	493	17	\$\$\$
Office clerks, general	463	15	\$\$
★ Registered nurses	451	22	\$\$\$\$
● Computer support specialists	439	102	\$\$\$\$
★ Personal care and home health aides	433	58	\$
Teacher assistants	375	31	\$
Janitors and cleaners	365	11	\$
★ Nursing aides and attendants	325	24	\$
● Computer engineers	323	108	\$\$\$\$
Teachers, secondary school	322	23	\$\$\$\$
Office and administrative support supervisors and managers	313	19	\$\$\$
Receptionists and information clerks	305	24	\$\$
Waiters and waitresses	303	15	\$
Guards	294	29	\$
Marketing and sales worker supervisors	263	10	\$\$\$
Food counter and related workers	247	12	\$

## Fastest growing occupations

Fast growing occupations usually have better employment prospects and conditions more favorable for mobility and advancement than do occupations with slow or declining employment. Of the 20 occupations growing fastest, 8 are health related (designated by ★) and another 8 are computer related (●). Thirteen are in the upper 2 of 4 earnings quartiles. The occupations are distributed among 7 education and training categories; none are in the 3 advanced degree categories.

Four occupations also appear in the chart of occupations gaining the largest number of jobs:

- ◆ Computer systems analysts
- ◆ Computer support specialists
- ◆ Personal care and home health aides
- ◆ Computer engineers

### Employment growth in selected occupations, projected 1998-2008

(Percent)

	Employment change		Earnings quartile
	Percent	Thousands	
● Computer engineers	108	323	\$\$\$\$
● Computer support specialists	102	439	\$\$\$\$
● Computer systems analysts	94	577	\$\$\$\$
● Database administrators	77	67	\$\$\$\$
● Desktop publishing specialists	73	19	\$\$\$
Paralegals and legal assistants	62	84	\$\$\$
★ Personal care and home health aides	58	433	\$
★ Medical assistants	58	146	\$\$
Social and human service assistants	53	141	\$\$
★ Physician assistants	48	32	\$\$\$\$
● Data processing equipment repairers	47	37	\$\$\$
Residential counselors	46	88	\$\$
● Electronic semiconductor processors	45	29	\$\$\$
★ Health information technicians	44	41	\$\$
★ Physical therapy assistants and aides	44	36	\$\$
● Engineering, science, and computer systems managers	43	142	\$\$\$\$
★ Respiratory therapists	43	37	\$\$\$
★ Dental assistants	42	97	\$\$
★ Surgical technologists	42	23	\$\$\$
Securities and financial services sales agents	41	124	\$\$\$\$
Total, all occupations	14	20,281	



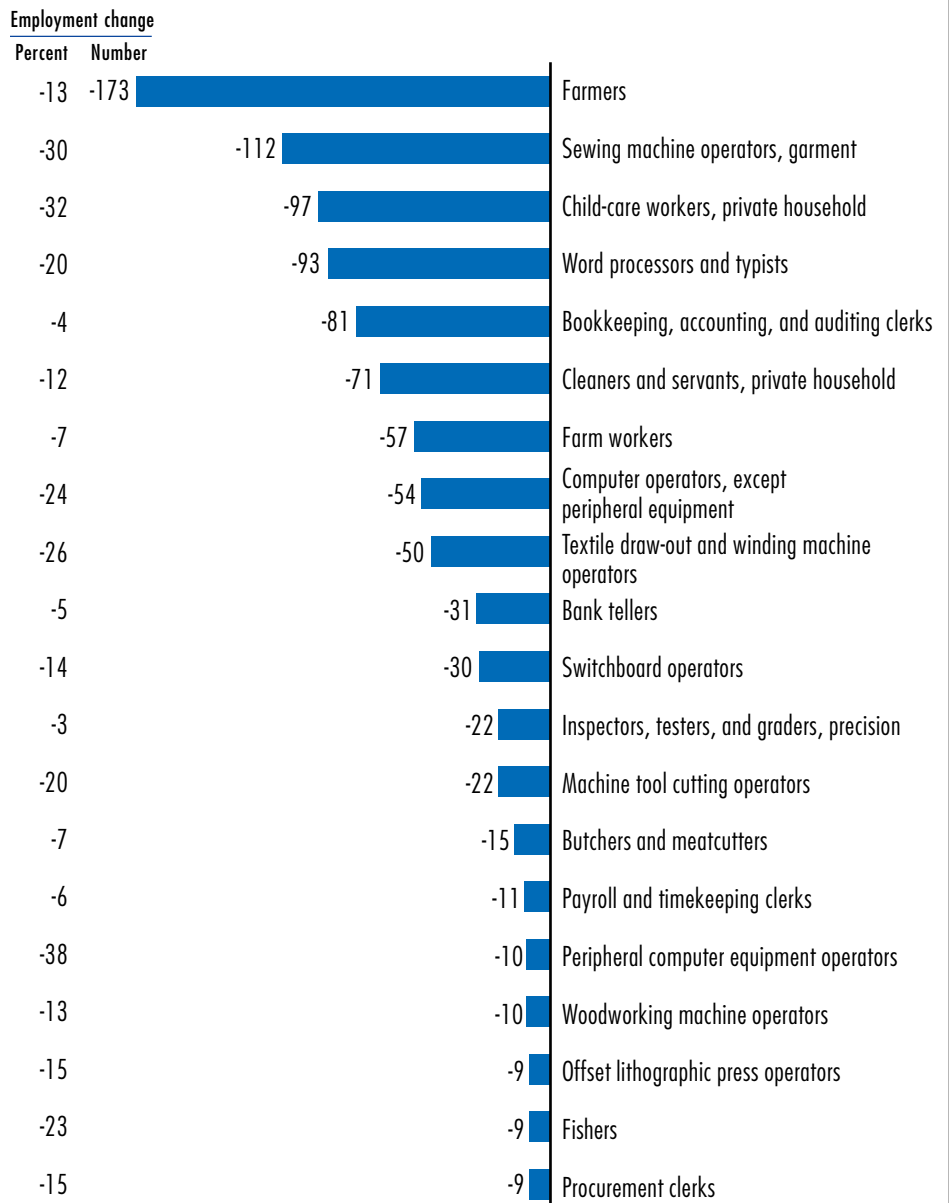
## Occupations losing the largest number of jobs

Occupational employment declines are caused by increased imports of or decreased demand for goods and services, technology that increases output per worker, or business decisions to transfer some job duties to other occupations. Seventeen occupations projected to have the largest employment decline are in the short- or medium-term on-the-job training category, and all are in the lowest two of four earnings categories.

Declining employment is usually a sign of unfavorable job prospects and limited opportunities for mobility or advancement. However, some openings will occur in occupations in which the number of people leaving employment is greater than the number of jobs lost in the decline.

### Employment decline in selected occupations, projected 1998-2008

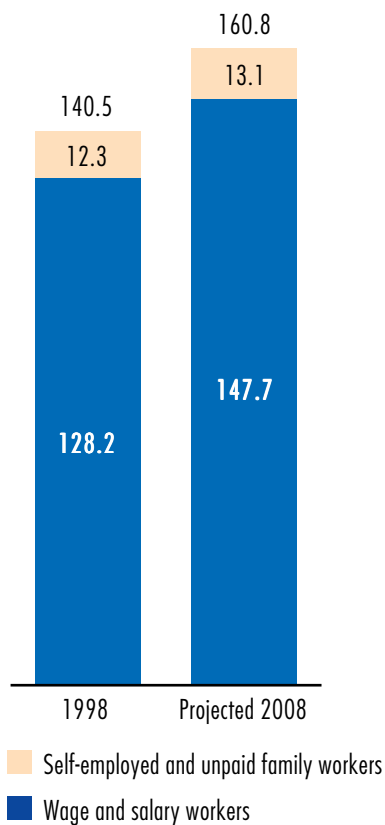
(Number in thousands)



## Employment by class of worker

About 12 million, or almost 9 percent, of all workers were self-employed in 1998; 182,000, or one-tenth of 1 percent, were unpaid family workers; and more than 128 million, or 91 percent, were wage and salary workers.

**Employment by class of worker, 1998 and projected 2008**  
(Millions)



Overall, employment is projected to grow 14 percent between 1998 and 2008. Projected employment growth of self-employed workers is over 6 percent; employment of unpaid family workers is projected to decline slightly. Wage and salary worker employment is projected to increase 15 percent.

**Employment change by class of worker, projected 1998-2008**  
(Percent)







Farmers, marketing and sales worker supervisors, and child-care workers had the largest number of self-employed workers in 1998. Child-care workers will grow in self-employment; however, farmers and marketing and sales worker supervisors will have significant declines in self-employment from 1998 to 2008.

**Occupations with the most self-employed workers, 1998**  
(Thousands)

