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Work for play:
Careers in video game development

Video games aren't only for play; they also provide work. The workers, known as game developers, make a living creating the games you enjoy playing.

Making video games is a serious—and big—business. According to the Entertainment Software Association, in 2009, the video game industry had sales in excess of $10 billion and employed more than 32,000 people in 34 states.

Creating these games is complex and requires the collaboration of many developers, who perform a variety of tasks, from production to programming. They work for both small and large game studios to create games that can be played on many different devices, including console systems, computers, and cell phones.

This article covers career options in video game development. The first section provides an overview of the development process. The second section describes four groups of video game occupations: designers, programmers, artists, and others. The third section covers the skills and training workers need for these jobs. The fourth section discusses the benefits and challenges of working in the video game industry. And the fifth section provides job-seeking tips for a career in video game development. Suggested resources for additional information are at the end of the article.

Lifecycle of a video game

The concept for a video game can come from a variety of sources. Many games start as a new idea for a story or technology the development team would like to explore. Others come from an established property, such as a novel or film. Still others attempt to perfect a style or formula found in another genre or game.

But whatever the impetus for its creation, almost every game follows a similar development process: preproduction, production, and postproduction. The length of this process is often determined at the beginning of the preproduction phase and depends on a game's size and programming needs.

Full-featured games, such as those made for consoles, have more complex programming and, therefore, take longer to develop—usually between 18 and 30 months. By comparison, most games that are played on social media and mobile devices require simpler technology, which results in a quicker development process of a few months.

Preproduction

Work completed during preproduction lays the foundation upon which a game is built. In this phase, the lead designers outline a game concept with the help of lead artists and programmers. Lead designers also might select a feature, such as an innovative gameplay element or powerful graphics, that makes the game unique.

The different design teams flesh out a specific part of the game, such as its mechanics and storyline. The designers then compile their ideas in a game design document, which describes the game and its features in detail.

From this document, programmers create a prototype game. Designers use feedback on the prototype to revise game features. Many game studios also use the prototype to secure financing from publishers, allowing the designers to continue developing the game.

Once the game receives funding, programmers begin building its technological framework. Meanwhile, artists create concept art, such as character illustrations, that helps designers visualize the game. Completion of the prototype signals the start of the production phase of development.

Production

In the production phase, teams of designers, artists, and programmers use the design document as a guide to create the game. The teams collaborate to make the most of each other's expertise. "Art isn't displayed correctly until an engineer makes it work, and it doesn't work until a designer defines how it should work," says Louis Catanzaro, creative director for BeachCooler Games in Waltham, Massachusetts.

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Video game developers carry a concept from preproduction through postproduction.

Artists use concept art to create textures, models, and animations for the characters, levels, objects, and environments that will populate the game world. Programmers finalize the game engine—a video game's physics and graphics systems—and tools. They also write the code that dictates everything from the game's rules to how its visual elements are displayed on the screen.

Designers meet with workers from the other departments to ensure that the game's design document is being followed. Feedback during production helps the designers revise the document as needed—for example, to improve a game's mechanics or remove an unfeasible feature.

Throughout production, developers continually build improved versions of the game. "The goal is to add more dimensions to the game," says David Sirlin, lead designer for Sirlin Games in Emeryville, California. "That is, to create more content that is better looking within a design that is more refined."

At the conclusion of the production phase, the fully playable game includes art, music, and sound effects. This milestone is referred to as "content complete."

Postproduction and beyond

Postproduction focuses on playing the game to test it for errors, called bugs, and on tweaking it to eliminate unwanted elements.

The quality assurance staff tests the game by playing it and attempting to do things the development staff never considered. As the game testers find bugs, they document the errors and assign them to a programmer, designer, or artist to fix.

Testers might also find that parts of the game are inconsistent or imbalanced. Fixing these issues might require tweaks to existing features and content.

Dealing with bugs and tweaks can make postproduction time-consuming. The process may take as long as production, especially for more complex games that have bigger budgets.

When a game is released, it is distributed for sale to players. However, the work does not end there. Games often need patches, which are frequent updates that might include bug fixes, tweaks to the game's balance, and new content. And a game's success might persuade the studio to develop an expansion—a large content and feature update that usually is sold separately as an addition to the original game.

Occupations in video game development

Making a video game requires many different workers. Developers have diverse specialties, including game design, programming, and art. Depending on the size of the studio in which they work, developers may have varied roles; smaller studios might have one worker performing multiple tasks, and larger studios might have multiple workers for each task.

Game developers make the most of their different skills to collaborate on a shared goal: creating the best game possible.

Designers

Designers are video game dreamers. They imagine almost everything about and in a game. To develop a game, teams of designers write detailed descriptions of their ideas for

all of its parts, including plot, characters, and gameplay. The teams hold regular meetings and select the best concepts.

When a game is in production, designers work closely with programmers and artists to ensure that their designs are being followed. Designers frequently use scripting languages, a type of programming language that controls applications, to view their ideas within the prototype game. Scripting languages do not require extensive coding and allow designers to test various concepts as they arise in gameplay. Then, designers choose the concept they like best. If issues arise during production, designers might have to go back and edit or review the game design document.

The different design teams focus on different parts of the game, under the direction of a lead designer. Some designers craft engrossing plots and characters. Other designers work on the mechanics of the game.

Lead designer. Lead designers collect and organize the design teams' ideas into a cohesive game design document. They also manage the teams' work tasks, schedules, and documentation. Lead designers meet with their staff and other departments to discuss new ideas, solve problems, and ensure that a game is built according to the design document.

Content designer. Content designers develop the game's plot and its characters. Creativity is important for these designers, but their work must fit within a game's world. For example, when writing for a realistic strategy game set in the Medieval Age, content designers ensure that no anachronistic objects or references are included. Content designers do much of their writing when the game is in preproduction, but changes during development require them to edit their work to match the altered product.

Game mechanic designer. Game mechanic designers focus on specific, vital pieces of gameplay. Consequently, their tasks—and job titles—depend on the genre of the video game on which they're working. For example, when working on a fighting game, these designers are called combat designers; they plan and document how the combat system should function.

Level designer. Level designers create the game's fantastic or realistic environments, selecting the objects and characters that inhabit them. To immerse players in the game, these designers choose the most appropriate settings for the type of game. For example, level designers for a horror game create dark, shadowy environments to make players feel apprehensive as they explore the levels. Level designers also map the location of objects and opponents in a level.

Writer. Writers create the text and dialogue that immerse players in the game. The

Under the direction of a lead designer, design teams focus on different parts of game development.

role of a writer varies with the genre of the game. Some genres, especially role-playing games, rely heavily on dialogue and need writers to prepare scripts for all in-game conversations. Other genres, such as puzzle games, have little need for writers.

Programmers

Programmers see a video game differently from the way its players—or even their fellow game development team members—do. To programmers, a video game consists of numerous lines of code that dictate how the computer should handle everything from the game's rules to its graphics. Under the guidance of the lead development team, programmers build video games from the ground up: writing code, line by line, in computer programs.

Programmers use different types of coding languages. Each language has different capabilities, and programmers choose the language that best suits their needs. The type of language that programmers select also is determined by the type of platforms—computers, consoles, or mobile devices—on which the game will be released.

Creating a full-featured video game requires many different types of programmers. Some programmers work on the game engine, the foundation upon which the game runs. Other programmers have more specific tasks, such as crafting the game's difficulty. "Almost any programmer can make a human player lose," says Bert Bingham, a producer at Gas Powered Games in Redmond, Washington, "but a truly good programmer knows how to make a player barely win."

Programmers build video games from the ground up: writing code, line by line, in computer programs.

Lead programmer. Lead programmers assign work to and develop schedules for the programming teams. Although they are skilled in writing code, lead programmers often spend most of their time on supervisory duties. They also meet frequently with the art, design, and production team leaders to address issues that arise during development.

Artificial intelligence programmer. Artificial intelligence programmers dictate how computer-controlled opponents and allies react to a player's actions. Artificial intelligence enables computer-controlled characters to respond realistically and strategically. Some video games, depending on the genre, require more complex artificial intelligence than others.

Graphics programmer. Graphics programmers create tools that allow artists to bring their work to the screen. Using their knowledge of advanced mathematics, graphics programmers implement complex algorithms to produce 2D and 3D graphics. These programmers also work closely with artists to determine the best way to incorporate artwork into a game.

Network programmer. Many video games are played online, allowing players across the globe to compete against or cooperate with one another. Network programmers write the code that enables this online play. They also develop security measures to prevent players from cheating.

Physics programmer. Video games aren't constrained by the real world, so physics programmers write the code for any natural laws, such as gravity, a game should follow or ignore. Guided by the designers' vision, physics programmers create rules that are either realistic or stylized. They also determine how

the different objects in a game will interact, such as two cars colliding in a racing game. And physics programmers usually write the code that dictates how particle effects, such as explosions and splashes, appear in video games.

Tools programmer. Tools programmers write code to automate some tasks, making game development easier for less technical team members. For example, tools programmers might write a program that simplifies the process of creating new levels or for importing art into the game. Tools differ from one game to another, based on designers' needs.

User interface programmer. The graphical menus in video games range from simple, two-button commands—"play" and "quit"—to complex series of menus with options. User interface programmers also build heads-up displays, which provide vital information to players. Collaborating with designers and artists, user interface programmers ensure that these systems are intuitive and as straightforward as possible.

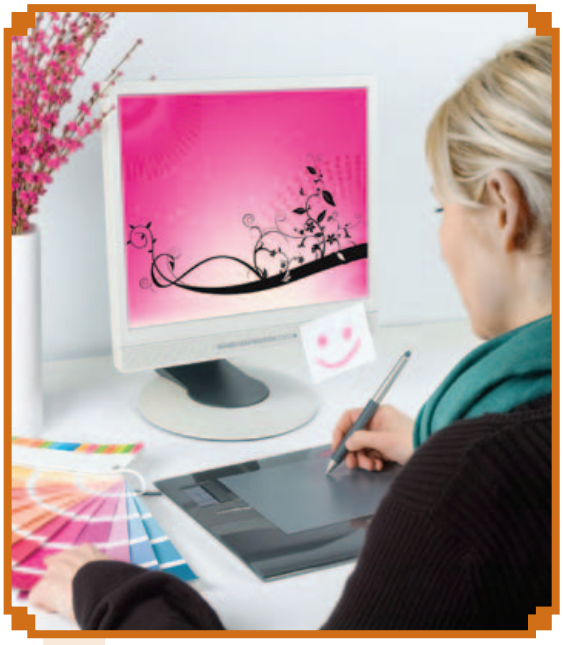
Artists

Artists breathe life into games. They design a game's aesthetic, or visual style, and create all of its artwork, including environments, characters, and objects. Artists also may design the game's manual, packaging, and promotional material.

Some artists use traditional methods, such as sculpting and freehand drawing, to illustrate their ideas. Preliminary artwork helps game designers visualize their ideas and serves as a guide for other artists to create computer art. Digital artists use modern tools that include 3D modeling, software created by the programmers, and motion-capture technology.

Art director. The art director coordinates with the lead development team and manages the art department, including its budget and schedule. By consulting with key designers and programmers, the art director also defines the game's aesthetic.

Lead artist. A video game may have one or more lead artists, each of whom manages a team and plans its method and tools for creating artwork. Lead artists also ensure that their team's art is consistent in quality and style.



Artists may use modern tools, such as a graphics tablet, to create a game's visual style.

Concept artist. Following the game's aesthetic direction, concept artists envision landscapes, objects, structures, characters, and key moments in a story. Concept artists produce a variety of art, including drawings, paintings, sculptures, and storyboards. This artwork helps designers visualize their ideas and guides other artists.

Modeler. Modelers build 3D characters and environments that are based on the concept art. To create the models' surfaces or skins, they paint and wrap 2D textures on a digital frame. Modelers also create character skeletons, which animators then control.

Animator. Animators manipulate models to create movements for objects and characters in the game. They digitally control the model as if it were a puppet and perform animations that dictate how the character or object will move in any given instance. For example, there might be an animation for a palm tree moving with the breeze or a character running.

Other artists. Other artists are involved in the development process, depending on the game. For example, motion-capture artists record the movement of real objects or people,

which then helps animators create more realistic movement in the game. Cinematic artists produce marketing videos to promote the game. And a photographer snaps pictures to inspire the game's concept art.

Other major occupations

Many other workers contribute to a game's development. These workers add sounds to the game, handle the studio's business concerns, and test the game for bugs.

Audio workers. Workers in the audio department develop, record, and process all of the game's sounds, including music, dialogue, and all other noises, both real and fictitious. Occupations include audio designers, audio engineers, audio programmers, composers, and musicians.

Executives. Studio executives, such as the chief executive officer and president, oversee the company and establish its philosophy, corporate structure, and business plan. They also negotiate business contracts and communicate with stakeholders.

Producers. Producers manage the administrative details of the studio's products and departments. Responsibilities include calling meetings, maintaining schedules, and keeping development costs within budget. Producers also help to ensure that a game is released on schedule, and they serve as liaisons between developers and executives.

Quality assurance testers. During post-production, quality assurance testers identify and report problems with the game. These problems may include software bugs, art glitches, and issues arising during gameplay. A lead tester oversees the quality assurance team and notifies other departments of problems that must be fixed.

Skills and training

Video game developers need skills and training specific to their job tasks, but they share some common aptitudes. For example, the ability to work well as part of a team not only is expected of game developers but may be required. "Successful work on a collaborative project is something we look for in hiring new employees," says Ben Bell of Salt Lake City, Utah, executive producer of The Sims 3 Pets.

Of course, a big part of collaborating is being able to articulate ideas clearly to other team members. This skill is especially important in game development, where teams

Workers in the audio department develop, record, and process all of a game's music, dialogue, and other sounds.

comprise members from several diverse departments. "You communicate with your lead artist, designers, and programmers—all usually very different types of people with very different points of view," says Catanzaro. "It's absolutely critical that you understand the art of communication."

Most workers also should be adaptable to making changes and work well under pressure. And those in leadership roles may benefit from having basic business skills in management, budgeting, and scheduling.

Highlighted next are the particular skills or training that different types of developers need.

Designers

There are no educational requirements for video game designers, but a college degree in game design, game development, or computer science is helpful. Experience in other roles in video game development is also beneficial. For example, some workers become designers after being promoted from other teams, such as quality assurance, programming, or art.

Game designers also need some background in programming and knowledge of scripting languages, especially Lua and Python. In addition, designers might need to be experts in other computer software. Level designers, for example, frequently use 3D modeling programs.

Programmers

Almost all programmers must have a bachelor's degree in computer science or computer engineering. Some colleges and universities have specialized programs that focus on video game programming.

Most importantly, programmers must be experts in the programming languages and operating systems used in game development. Nearly all programmers are skilled in C or C++, computer languages that are commonly used to create video games. Depending on their specialty or the game platform, programmers also might need to know other languages, such as Perl, Assembly, or Lua.

Many programmers, especially those who create vector graphics, have knowledge of high-level math. Other skills vary by specialty. For example, network programmers should have expertise in server security issues, and graphics and user-interface programmers usually have some training in art.

Artists

Educational requirements for video game artists vary, but most artists have attended art school. In addition to teaching art theory, these schools introduce artists to different art styles and methods. This background is important because all game artists must first master traditional art techniques and their basic principles—such as form, line, and color theory. They also need to understand modern artmaking tools, such as modeling and editing software.

But an artist's most important asset is the portfolio, which showcases his or her experience and talent. And formal instruction improves the artist's work, says Catanzaro: "Your education sharpens your skills and refines your portfolio."

Other major occupations

Other occupations are diverse, so their educational requirements vary. Audio workers need technical training, which can require an associate's or bachelor's degree. Executives and producers usually need at least a bachelor's degree. And quality assurance testers sometimes need no more than a high school diploma.

Rewards and challenges

Working in video game development has both advantages and disadvantages. One of the advantages is earnings. The U.S. Bureau of Labor Statistics (BLS) does not collect data specifically on the video game industry, but anecdotal information suggests that most of these workers earned more than the BLS median annual wage estimate of $33,840 for all workers in May 2010.

According to *Game Developer* magazine, which surveys the industry each year, average salaries for video game development workers in 2010 ranged from about $49,000 for quality assurance testers to $107,000 for business professionals, such as executives. Audio workers, artists, and designers earned an average of at least $68,000, while programmers and producers averaged more than $85,000. As with salaries in other industries, salaries for video game developers vary by occupation, experience, and location.

For many people in the video game industry, though, their jobs are more about passion than pay. "We work on something we love," says Bingham. "When we leave the office, we go home and play games."

Working in a game studio provides an opportunity to interact with others who share that passion. The workers who contribute to making a video game foster a fun and creative community. "I love being able to work alongside people who do amazing things every day," says Rachel Steinberg, a public relations specialist for Electronic Arts in Salt Lake City, Utah.

Most video game developers enjoy playing games even in their free time.

But creating games isn't all fun. Although a good game might receive critical or popular acclaim, a bad game could mean financial trouble for a studio and its employees. Consequently, the pressure to succeed is often intense.

Limited time and resources can frustrate developers who have ambitious game ideas. In some cases, the final game might not perform the way the designers originally envisioned. Even more demoralizing is a game concept that works only on paper. "We are trying to catch lightning in a bottle," says Sirlin of Sirlin Games. "It can be soul crushing when you find out that your game really doesn't work."

Even when a concept does work, turning it into a full-featured product is a daunting process. Developers work long hours to release a game on schedule. And if studio executives fear that the game might miss production deadlines, they usually increase the hours and days the staff will work—often for months at a time. This period, known as "crunch time," is tough on workers and their families.

Despite the challenges of developing video games, many workers say they'd still choose their jobs over others. "You're not sitting at a desk pounding away at numbers all day," says Denny Chiu, a corporate communications manager at Electronic Arts. "We make fun."

Finding work in video game development

As the costs of producing a video game have increased, many large studios are choosing to focus their resources on creating higher quality, but fewer, games. To maximize quality, these studios usually seek experienced employees to work on their most lucrative projects.

Because of the difficulty of getting an entry-level job at a large studio, many prospective workers enter the industry through alternative paths. For example, as the tools for

making games become more accessible, aspiring developers are better able to build portfolios. A designer might make a small, original game or modify an existing one. And an artist might create artwork in the style of his or her favorite game. "You don't have to wait to be discovered," says Sirlin. "The barriers to entry are lower than ever before."

But getting a job at a large studio isn't the only option for working in game development. More developers now work for the small studios that create the increasingly popular games for social media and mobile devices. These games are usually shorter and simpler to make, providing workers an excellent opportunity to become developers.

Another useful strategy for breaking into the video game industry is to visit the websites, blogs, and online forums that developers frequent. "Developers often post open positions and ask for portfolios through those venues," says Catanzaro. Contributing to these online resources can also help increase your exposure.

Exposure is important because it helps with networking, which is a great way to find video game work. "I wrote about game design on my blog and on large gaming websites," says Sirlin. "My posts increased my visibility, opened doors for me, and allowed me to meet the right people."

The rules for finding work in today's video game jobs may not apply to the jobs that emerge tomorrow. But that's one more thing video game developers find exciting about their work. "Gaming is morphing into something unknown," says Bingham. "The possibilities are endless."

For more information

Video game development is a lengthy process that involves many different types of workers. This article describes the major occupations involved in creating a video game. Most of these occupations and hundreds of others are described in the *Occupational Outlook Handbook*, online at **www.bls.gov/ooh**. The *Handbook* also is available in print in many public libraries, career counseling offices, and job centers.

For general information about the video game industry, contact

Entertainment Software Association
575 7th St., NW
Washington, DC 20004
www.theesa.com

For more information about the salaries and benefits of video game professionals, contact

Game Developer Magazine
600 Harrison St.
6th Floor
San Francisco, CA 94107
www.gdmag.com

For more information about video game artists, contact

Graphic Artists Guild
32 Broadway
Suite 1114
New York, NY 10004
(212) 791-3400
www.graphicartistsguild.org

Paving the occupational path:
A new system for assigning education and training

How should you prepare to enter an occupation? It depends, of course, on the occupation. Training and education paths vary widely. But knowing the most common ways people prepare for an occupation helps you identify which one you might pursue—and helps guide you in that pursuit.

For career-guidance purposes, the U.S. Bureau of Labor Statistics (BLS) assigns education and training categories to occupations. Students, educators, jobseekers, and others use the information to prepare or learn about occupations in the U.S. workforce. This information is not used, however, to establish an occupation's education, licensing, or practicing standards.

Along with developing the upcoming 2010–20 projections, BLS is implementing a new system of assigning education and training categories. This new system includes categories for education, experience, and training assignments that give a detailed explanation of the usual requirements for entering and attaining competency in an occupation.

This article provides an overview of the new categories, with examples of each. The first section summarizes each of the three categories of education and training: typical education needed for entry, work experience in a related occupation, and typical on-the-job training needed to attain competency in an occupation. The second section explains how BLS developed the system and how economists determined an occupation's category assignments. Sources of additional information are at the end.

Understanding the new system

The new education and training system defines what is typically needed to enter and become competent in an occupation. Eighteen assignments across three categories provide specifics about an occupation's education, experience, and training. The box on page 15 uses sample occupations to illustrate the new system.

The first two categories—typical education needed for entry into an occupation and work experience in a related occupation—are preemployment requirements, meaning that workers have completed them before they can get a job in an occupation. The third category—typical on-the-job training needed to attain competency in the occupation—is usually a postemployment requirement, occurring after workers are hired.

Typical education

Each occupation is assigned to 1 of 8 education levels, from doctoral or professional degree to less than a high school diploma. The assignment in this category indicates the typical level of education that most workers need to enter an occupation.

Doctoral or professional degree. A doctoral degree (Ph.D.) or first professional degree, such as in law or medicine, usually requires the completion of 3 years or more of

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full-time academic study beyond a bachelor's degree. Examples of occupations in which workers must have these types of degrees are postsecondary teachers, lawyers, and dentists.

Master's degree. A master's degree usually requires the completion of 1 or 2 years of full-time academic study beyond a bachelor's degree. Occupations in this category include physician assistants; educational, vocational, and school counselors; and statisticians.

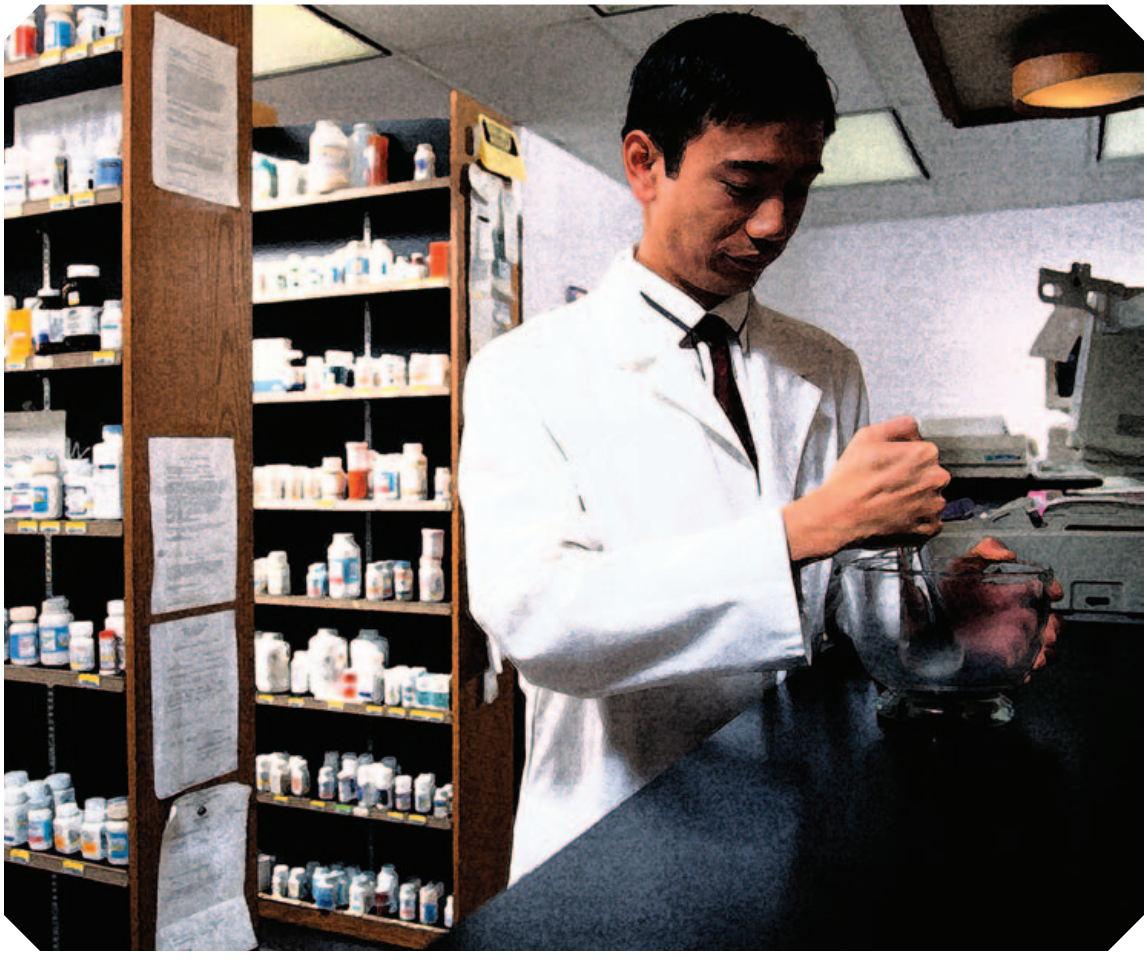
Bachelor's degree. Completion of a bachelor's degree usually involves at least 4 years, but not more than 5 years, of full-time academic study beyond high school. Budget analysts, dietitians, and petroleum engineers are among the occupations in which workers need a bachelor's degree.

Associate's degree. Occupations in which workers need an associate's degree have this assignment. Completion of an associate's degree usually involves at least 2 years, but not more than 4 years, of full-time academic study beyond high school. Programs are offered at community colleges, technical colleges, and other educational institutions. Occupations include dental hygienists, respiratory therapists, and mechanical drafters.

Postsecondary nondegree award. Occupations with this assignment usually require workers to have completed a formal program after high school that leads to a certificate or other award but does not lead to a degree. These programs are offered only at educational institutions; certification programs run by professional organizations or certifying bodies are not included. Examples of occupations that require a postsecondary nondegree award are emergency medical technicians and paramedics, nursing aides, and hairstylists.

Some college, no degree. Few occupations have this assignment. It includes

(Continued on page 16)

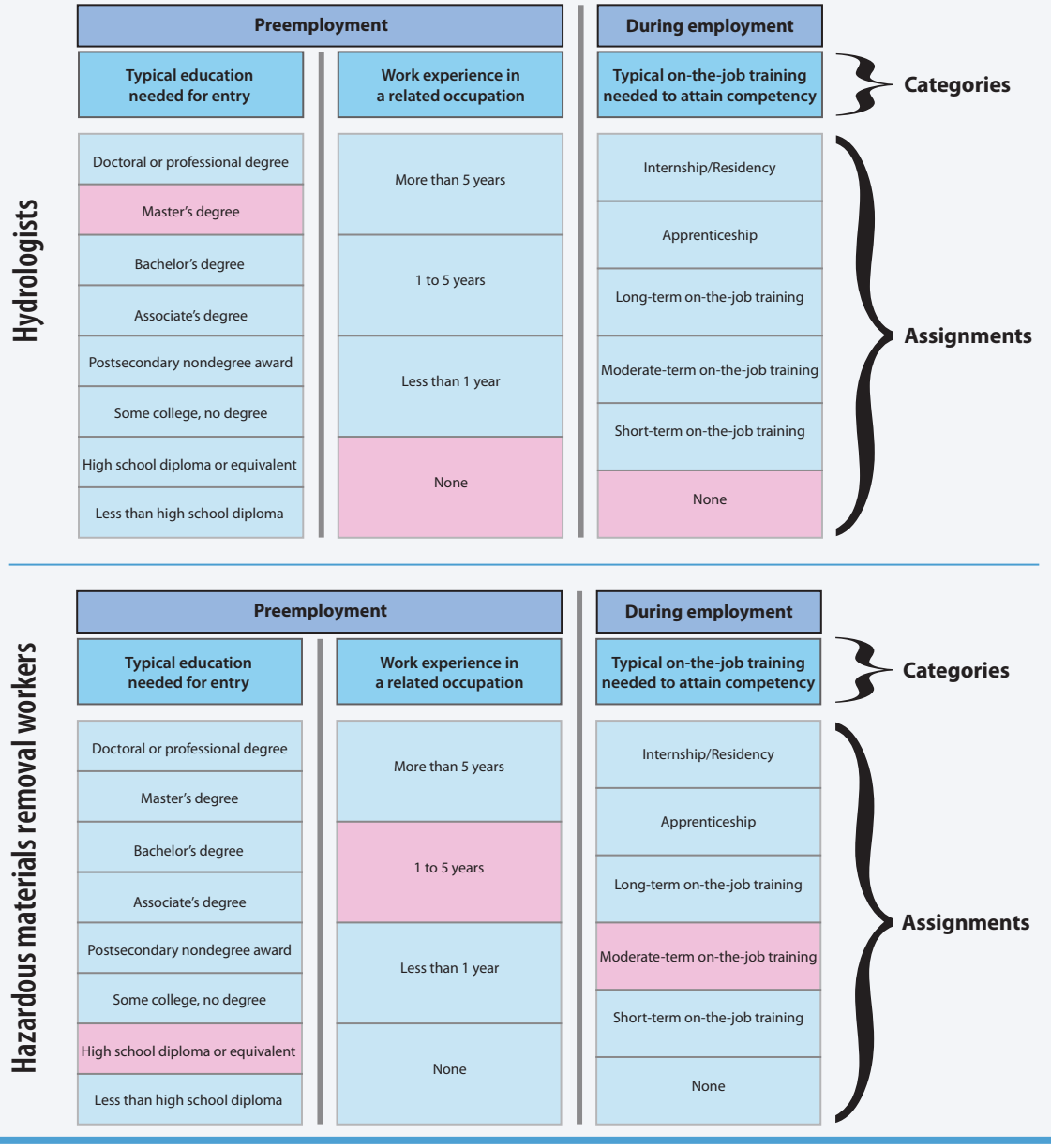


Sample education and training assignments

Compared with the previous system for assigning education and training categories to occupations, the new system gives a more complete picture of the requirements for entering and attaining competency in an occupation.

As the following examples illustrate, assignments in two categories cover the typical education and related work experience usually required prior to employment, and assignments in a third category include the types of on-the-job training that generally occur during employment. The rose-colored shading identifies the category assignments for the sample occupations.

Economists in the U.S. Bureau of Labor Statistics (BLS) base these assignments on research they conduct for the *Occupational Outlook Handbook*. This information is provided to help students, educators, jobseekers, and others interested in careers. BLS does not have a role in establishing standards for education, licensing, or practice in any occupation.



(Continued from page 14)

occupations in which workers usually need a high school diploma or its equivalent plus the completion of one or more postsecondary courses that do not result in a degree or other award. Actors, for example, typically need some postsecondary dramatic instruction, but they need not earn a degree or award as a result.

High school diploma or equivalent. This assignment covers occupations in which workers need a high school diploma or its equivalent, such as the General Educational Development (GED) credential. Occupations include social and human service assistants and pharmacy technicians.

Less than high school. Occupations with this assignment are those in which workers have completed a level of primary or secondary education that did not result in the award of a high school diploma or its equivalent. Cashiers, carpet installers, and janitors and cleaners are among these occupations.

Related work experience

To enter many occupations, it's helpful to have work experience in a related occupation. However, assignments in this category apply only to occupations in which such experience is required or in which related experience is a commonly accepted substitute for formal education or training.

More than 5 years. Some occupations require significant work experience. For example, computer and information systems managers might need more than 5 years of work experience in a computer-related occupation, such as computer systems analyst, programmer, computer software engineer, or computer support specialist.

1 to 5 years. Marketing manager is an example of an occupation in which workers typically need 1 to 5 years of work experience, usually in marketing or a related field, to qualify for their positions.

Less than 1 year. For occupations with this assignment, entry-level workers typically need less than 1 year of related work experience. Restaurant cooks are an example of an occupation with this assignment.

None. Most occupations have this assignment. For example, audiologists usually do not need work experience in a related occupation to enter their field.

On-the-job training

Some workers receive training on the job that helps them acquire the skills they need to become competent in the occupation. As mentioned previously, this on-the-job training usually begins after a worker is hired. But there are some exceptions. Most elementary school teachers, for example, must complete an internship to attain competency in the occupation, but they usually get this training while they are in school and before they are employed as teachers.

Keep in mind that the on-the-job training assignments described here are occupation specific, not job specific. This distinction is important because occupation-specific training allows workers to transfer skills they learn in one job to another job in the same occupation. In contrast, job-specific training helps workers perform a particular job—learning about an individual employer's procedures or equipment, for example—but is not necessarily transferrable to another job.

Internship/residency. Internships and residencies provide supervised training in a professional setting. These programs give prospective workers the opportunity to apply what they have learned in school to a real-world setting. Internships and residencies may be paid or unpaid, and they generally occur after the completion of a degree program or required coursework.

This assignment includes only programs that are required for workers to be employed in an occupation. It does not cover optional internships that help workers gain experience or advance in a field. Doctors, high school teachers, and marriage and family therapists, for example, all must complete an internship or residency program before they can be licensed to work in their occupations. Internship and residency programs vary in length.

Teaching internships often last 1 year, for example, but medical internship and residency programs may take between 3 and 8 years.

Apprenticeship. An apprenticeship combines paid on-the-job training with occupation-specific instruction. Apprenticeships are formal relationships between workers and sponsors, which may be individual employers, joint employer and labor groups, or employer associations. These programs typically provide at least 2,000 hours of training on the job and 144 hours of occupation-specific technical instruction per year—and most programs last between 3 and 5 years. Electricians and structural iron and steel workers are two examples of occupations that have an apprenticeship.

Long-term on-the-job training. This assignment designates training that lasts more than 12 months and either occurs on the job or combines work experience with formal classroom instruction. For example, nuclear power reactor operators often begin as trainees and take formal courses to prepare for their required licensing exams. Occupational training programs that are sponsored by employers, such as those offered by police and fire academies, also are included.

Moderate-term on-the-job training. Moderate-term on-the-job training allows workers to develop skills for competency in 1 to 12 months of informal training and on-the-job experience. Employer-sponsored occupational training programs are included in this assignment. Advertising sales agents, geological and petroleum technicians, and home appliance repairers are among the occupations that require moderate-term on-the-job training.

Short-term on-the-job training. Occupations with this assignment require 1 month or less of informal training and on-the-job experience for workers to gain the skills that they need to become competent. The assignment includes occupation-specific training that is

sponsored by employers, such as programs that teach taxi drivers about equipment, safety, and other topics. Retail salespersons and maids and housekeeping cleaners are other examples of occupations that require short-term on-the-job training.

None. Some occupations do not require any occupation-specific on-the-job training. Professional occupations, which usually have educational requirements, are especially likely to have this assignment. For example, geographers and pharmacists can perform their work competently without getting any additional training on the job.

Developing the new system

When BLS was developing the new education and training system, its goal was to provide a more complete summary of how a worker enters and becomes competent in an occupation. For some occupations, the most common path to entry involves a combination of education and training, such as a high school diploma and an apprenticeship. The new system allows an occupation to be assigned to multiple categories—unlike the previous system, which allowed assignment to just one.

But no classification system is perfect. Because many occupations have multiple paths to entry, assigning only the most common path in each category necessarily leaves out other, often important, ways that people enter occupations. In the education category, for example, registered nurses have the assignment of associate's degree because it is the most common education for entry-level registered nurses; however, some registered nurses enter the occupation with a higher degree, such as a bachelor's.

Development process. The process of developing a new education and training system began with a team of BLS economists who met to discuss possible alternatives to the previously existing categories. The team also considered input from reviewers outside BLS, including comments received from *Federal Register* notices in 2008 and 2010. After much discussion, the team developed a system involving three categories of education and training as previously described:

- Typical education needed for entry
- Work experience in a related occupation
- Typical on-the-job training needed to attain competency.

Each of these categories would offer multiple assignments. The additional information should be even more helpful to career seekers, educators, and others interested in occupational entry requirements.

Education and training resources. Assigning education and training categories involved considerable effort: BLS provides information on about 750 occupations.

To make category assignments for each occupation, BLS economists researched and analyzed a variety of information. Two sources of data important for the analyses were the American Community Survey and the Occupational Information Network (O*NET).

The American Community Survey, conducted by the U.S. Census Bureau, is a household survey that measures the educational attainment of people currently in an occupation. Economists used information from this survey to look at workers' educational attainment for three groups—18 to 29 years old, 30 years and older, and all workers in an occupation. They compared the distribution of educational attainment among workers in an occupation, mindful that educational attainment differs from educational requirements. These comparisons helped economists get a glimpse into whether an occupation might have multiple paths to entry.

The surveys conducted for O*NET asked workers and occupational experts questions related to education, work experience, and training. These O*NET surveys are produced by the U.S. Department of Labor's Employment and Training Administration.

After considering all of their research, economists determined category assignments for each occupation. In cases with more than one path to entry within an occupation, economists assigned the education, experience, or training categories that best described the path that most workers need to enter or gain competency in the occupation.

For more information

To learn more about the new system, see "Education and Training Classification System Update—Final System" online at **www.bls.gov/emp/ep_finaledtrain.htm**. The page includes links to the *Federal Register* notices, answers to frequently asked questions, and system codes representing the new assignments.

As mentioned previously, education and training requirements vary significantly from one job to another, even within an occupation. And some occupations require licensure, which is not covered in these categories or assignments.

State-specific requirements, such as licensure, can be obtained by contacting state licensing boards. In addition, the 2012–13 edition of the *Occupational Outlook Handbook* (*OOH*), available in spring 2012, will include licensure information along with discussions of the education and training assignments.

The current *OOH* provides information about the many paths to entry that an occupation might have. Read the *OOH* online at **www.bls.gov/ooh**, or look for it in your local library or career center.

The new education and training category assignments will be published in a table in fall 2011 and as a searchable database with additional tables in winter 2012. Visit the BLS Employment Projections website, **www.bls.gov/emp**, for announcements about publication.

Navigating college options

The National Center for Education Statistics collects lots of information about educational institutions. So it should come as no surprise that the Center has an excellent online resource for students who want to learn more about their options for postsecondary education.

This resource, College Navigator, helps students to find out almost anything they want to know about the nation's colleges—all in one place. Students can search for institutions by using broad criteria such as school name, geographic location, and programs and majors. But the tool also allows for more detailed searches, such as for schools offering a rural or urban setting or having a particular religious affiliation.

A search brings up a list of schools (including 2- and 4-year, public and private) that match the selected criteria. Students then select from schools on the list for access to plenty of data, including the number of recent graduates in each program or major, estimates of total tuition costs, and the previous year's number of applicants and rate of admission.

College Navigator offers students a way to focus their postsecondary school search on institutions that match their interests, abilities, and budget. Try the tool online at **nces.ed.gov/collegenavigator**.

Online tools for jobseekers

No need to feel intimidated when searching for career resources online: The U.S. Department of Labor can help make such searches more manageable.

The Labor Department's CareerOneStop has a collection of Web-based tools serving students, jobseekers, employers, and the workforce. CareerOneStop asked organizations to submit online career and job-search tools for public evaluation. The public provided input, and the top-rated sites in six categories were announced last year. These categories, now available on the Tools for America's Job Seekers section of the Career OneStop website, are as follows:

- General job boards, listing sites that provide nationwide job listings for the public
- Niche job boards, targeted at specific types of jobseekers (such as older workers)
- Career planning tools, focusing on individuals who are switching careers, upgrading skills, or entering the workforce
- Career exploration sites, covering topics such as occupational exploration, occupational assessment, and career coaching
- Social media job search sites, specializing in job searches or postings that use social media
- Other tools, including all those that do not fit into other categories; examples are interview preparation tools, training grants, and English as a Second Language online tools.

To check out these top-rated tools, visit **www.careeronestop.org/jobseekertools**.

Design program in athletic footwear

Do you have a fashion flair for fitness footwear? Consider designing athletic shoes.

The Fashion Institute of Technology offers the nation's only certificate program in performance athletic footwear design. The program focuses on conceptualizing and sketching shoe designs. The sequence of courses—which cover the ergonomic, anatomical, and material considerations of athletic footwear design—guides the student from drawing rough sketches of concepts to creating a model of a shoe's outer sole.

No previous shoe design experience is required to enroll. However, it's useful to have some experience with sketching and drawing and to have a good grasp of design software applications. The institute also offers courses for students who wish to upgrade their skills before entering the program.

Most courses meet at night for 3 hours per week for about 15 or 16 weeks at the institute's Manhattan campus. Some courses are offered on weekends. The certificate usually takes at least four terms to complete.

For more information, write to program advisor Ellen Goldstein at the Fashion Institute of Technology, School of Continuing and Professional Studies, 227 West 27th Street, Building D, New York, New York 10001; email her at *ellen_lynch@fitnyc.edu*; or call her at (212) 217-5402. You may also visit the program's website at **www.fitnyc.edu/7165.asp**.

Smithsonian fellowships and internships: Opportunities abound

The Smithsonian Institution is known for paintings, pandas, and a plethora of other exhibits. Thanks to its vast collections, the Smithsonian is able to offer learning opportunities through more than a thousand fellowships and internships each year.

Fellowships allow students and scholars to pursue academic research. The roughly 400 awards each year include 10-week fellowships with a $6,500 stipend for graduate students and yearlong fellowships for established academics that pay stipends of up to $50,000.

There are about 1,200 internships, which are individually arranged to be structured learning experiences. The internships last from 10 to 12 weeks, with most occurring during some part of a standard academic year. About one-third of the internships offer a stipend, and amounts vary significantly by program. Participants must be at least 16 years old.

Most Smithsonian facilities—art galleries, historical and heritage museums, libraries, and research centers—are located in and around Washington, D.C. So that's where most fellowship and internship opportunities are located, too. But facilities and opportunities also exist in other U.S. cities and in Panama.

The exact number of fellowships and internships awarded each year depends on the program and available funding. Candidates usually apply directly to specific programs, but the Smithsonian's Office of Fellowships and Internships is a central administrator.

For more information, write to the Office of Fellowships and Internships, Smithsonian Institution, 470 L'Enfant Plaza, SW, Suite 7102, MRC 902 PO Box 37012, Washington, D.C. 20013; visit online at **www.si.edu/research+study**; email *siofg@si.edu*; or call (202) 633-7070.

Helping those in need: Human service workers

Many people experience hardship and need help. This help is provided by a network of agencies and organizations, both public and private. Staffed by human service workers, this network, and the kinds of help it offers, is as varied as the clients it serves. "Human services tend to be as broad as the needs and problems of the client base," says Robert Olding, president of the National Organization for Human Services in Woodstock, Georgia.

Human service workers help clients become more self-sufficient. They may do this by helping them learn new skills or by recommending resources that allow them to care for themselves or work to overcome setbacks. These workers also help clients who are unable to care for themselves, such as children and the elderly, by coordinating the provision of their basic needs.

The first section of this article explains the duties of human service workers and the types of assistance they provide. The next several sections detail the populations served by, and the occupations commonly found in, human services. Another section describes some benefits and drawbacks to the work, and the section that follows discusses the education and skills needed to enter human service occupations. The final section lists sources of additional information.

What human service workers do

Human service workers provide a variety of services aimed at improving clients' lives. The type of assistance they offer varies by client group, the type of organization that employs these workers, and their role in the organization. (See the box on page 25 for more information about different types of human service organizations.)

Although duties vary by job, all human service workers perform many of the same basic tasks. They evaluate a client's needs, create a treatment plan, and put the plan into action. Throughout the process, they provide clients with emotional support.

Evaluate and plan

Working closely with the client, human service workers identify problems and create a plan for services to help the client solve these problems. This process—which includes evaluating the client's support system, environment, and values—is tailored to each individual's needs. "Steps differ, based on where the client is at that point in time," says Deborah Jackson, a family self-sufficiency coordinator for a housing commission in the Annapolis, Maryland, area.

Human service workers can't force help on someone who doesn't want it, and they can't take over a client's life. Instead, they try to help every client make good decisions, find resources to overcome problems, and inspire the client to make improvements. "I know they can succeed," Jackson says of her clients, "but I can't succeed for them."

Put the plan into action

After evaluating the client's situation and creating a plan, human service workers put the

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plan into effect. This may include providing direct assistance or helping clients in coordinating services, or both.

Practical assistance helps clients accomplish daily living activities: eating, bathing, dressing, and so forth. Workers most often provide this assistance in institutions, such as hospitals, shelters, and residential care facilities for people who are elderly or disabled. Practical assistance might also include helping clients with recreational activities, from arts and crafts to games.

In addition, human service workers coordinate services that are provided by their own or other organizations, including government, for-profit, and nonprofit agencies. They help clients by researching types of, and eligibility requirements for, assistance. For example, human service workers might help a client who lives in unsafe housing locate and qualify for low-income apartments in the client's community. Another way that human service workers help coordinate services is to assist clients with completing necessary paperwork.

After clients begin receiving assistance, human service workers monitor the clients' status to ensure that services are being provided and are appropriate. Jackson, for example, sees her clients about once a week so she can track their progress.

Provide emotional support

Because their clients often face many difficult problems simultaneously, human service workers routinely provide emotional support along with other forms of help. These workers must foster a good working relationship to ensure that a client feels comfortable discussing problems candidly and asking for help.

The kind of emotional care human service workers provide ranges from empathy to celebration, depending on what a client is experiencing. "Clients have the enthusiasm to improve their lives," says Jackson. "It's often a

Human service workers act as liaisons between clients and care providers.

Types of human service organizations

Human service agencies are often managed by state or local governments. There is also a large number of nonprofit—and some for-profit—human service organizations. Some organizations focus on working with a particular population or alleviating a specific type of problem. Others work with a wide range of populations and issues.

Most of these organizations are part of the social assistance industry. The organization types described below differ somewhat from the formal classifications that BLS uses.

Employment agencies provide clients with the assistance necessary to find and keep jobs. Employment agencies include job placement agencies and vocational rehabilitation services for people with disabilities.

Food and nutrition agencies help clients get healthy meals or learn the skills necessary to prepare nutritious meals themselves. Food delivery programs and food banks are examples.

Housing and shelter organizations help clients find appropriate temporary or permanent housing. Organizations include senior housing facilities, homeless shelters, and transitional housing.

Legal and victims assistance organizations assist people who have been victims of crime. These organizations also provide information to educate the public about crime prevention, and they help rehabilitate people who have been convicted of crimes. Examples include abuse prevention programs, juvenile justice organizations, and prisoner rehabilitation programs.

Multipurpose human service organizations provide multiple services that help clients improve their situation. Among these organizations are senior citizen centers, foster care and adoption agencies, and women's shelters.

Public safety and disaster relief organizations help people prepare for and recover from disasters. Examples include disaster relief and search-and-rescue organizations.

Youth development organizations provide recreational and social programs for children and teenagers. Among these are Big Brothers/Big Sisters, Boys & Girls Clubs, and afterschool programs.

lack of confidence that prevents them. They've never had someone encourage them."

However, human service workers are trained to recognize when emotional support and encouragement are not enough. In those cases, human service workers may direct a client toward additional support services to address more serious issues, such as domestic violence.

Populations served by human service workers

Human service workers assist a diverse population of clients, who are of every age and have a broad range of issues. "The client base of human services runs the gamut," says the National Organization of Human Services' Olding. Neil Headman, assistant professor of human services at the University of Illinois at Springfield, agrees. "It doesn't matter who your client is," he says. "Everyone needs help."

The following overview of types of clients is not exhaustive. Furthermore, clients dealing with more than one problem may fall into more than one group; for example, someone with a mental illness may also have a problem with substance abuse.

Children and families. Human service workers ensure that children live in safe homes and have their basic needs met. Guiding parents in caring for their children may include assisting with applications for food stamps or low-income housing and locating reliable childcare.

In some cases, such as those involving physical abuse or domestic violence, human service workers might recommend that children be removed from their parents' custody and be placed in foster care or group homes. This removal may be temporary or permanent, but the goal is to work with parents toward improving the situation so that children can return home. "The best place to serve kids is in their home and with a family," says Joan Wallace-Benjamin, who runs a child welfare agency in the Boston, Massachusetts, area. If a return home isn't possible, human service workers try to find permanent homes and adoptive parents for the children.

The elderly. Human service workers who assist older clients help them to live independently in their own homes whenever possible.

Human service workers assist clients of all ages.

This might mean coordinating the delivery of prepared meals or the placement of personal care aides to help with daily living activities.

For older clients who are unable to live alone, human service workers help with their placement in nursing homes or other residential care facilities. For clients nearing the end of their lives, human service workers may coordinate the provision of hospice care. (For information on nursing careers in nursing homes and other facilities, see "Nursing jobs in nursing homes," in the spring 2011 issue of the *Quarterly*, available online at **www.bls.gov/ooq/2011/spring/art03.pdf**.)

The homeless. Human service workers help people who are homeless to meet basic needs. Human service workers may refer clients to a variety of providers, such as temporary or permanent housing facilities, organizations that serve meals, and job centers that can assist the clients in learning new skills or finding jobs. Some clients might need help finding treatment to address an underlying cause of homelessness.

Immigrants. Immigrants often need help adjusting to life in a new country. Human service workers help them find housing, jobs, and other resources, such as programs for learning English. In some cases, human service workers also refer clients to legal aid services to assist immigrants with paperwork and other administrative issues.

People with addictions. Human service workers help people who are struggling with many types of addiction, such as to alcohol or gambling. They evaluate clients' needs and then direct clients to rehabilitation facilities, including both inpatient and outpatient treatment centers, that can best meet those needs. They also refer clients to groups or programs to help clients get support outside of treatment. Some human service workers might work with families of addicts, helping family members understand the nature of addiction and referring them to support programs for families.

People with criminal records. People who have been imprisoned face challenges re-entering society, such as overcoming

the stigma of their criminal record. Human service workers help these clients integrate back into society by matching them with job training or placement programs, helping them find housing, and directing them to support programs so they avoid reoffending.

People with disabilities. In working with people who have disabilities, human service workers often focus on helping clients live independently. Types of assistance include finding rehabilitation services to help clients adapt to the disability, working with employers on adjusting job details so that positions may be filled by clients with disabilities, and referring clients to personal care services that can help with daily living activities.

For people with disabilities who cannot live independently, human service workers help locate suitable residential care facilities.

People with mental illnesses. Human service workers direct clients who are mentally ill to appropriate resources, such as self-help and support groups. In addition, they help clients with severe mental illness to become self-sufficient and receive proper care. Human service workers refer these clients to providers of personal care services, group housing, or residential care facilities.

Veterans. For some veterans, adjusting to civilian life after military service can be difficult. Human service workers assist these veterans in a variety of ways: finding housing, adapting skills gained in the military to civilian jobs, and navigating through the extensive network of veteran services available.

Combat veterans often face additional challenges, such as adapting to physical or mental disability. Human service workers direct veterans with disabilities to services that provide appropriate assistance.

Aiding clients with disabilities often centers around helping them to live independently.

Common jobs for human service workers

Human service agencies are organized differently, but some jobs are common to many of them. Not all of these positions are in all agencies; job tasks in one position may overlap with those in another, and some agencies may use different titles. Furthermore, job titles include occupations that are found outside of human services, and job tasks may differ in other settings.

Jobs in human services are separated into two types: Those in which workers deal directly with clients and those in which workers provide administrative support for an organization that provides services. Both types are essential for human service organizations to run effectively.

Direct work with clients

Human service workers who deal directly with clients are responsible for providing the services that an organization offers. Job titles for people who work directly with clients include the following:

Case workers and case managers. Case workers and case managers assess clients' needs and work with them to develop a treatment plan. These workers, who are sometimes called social and human service assistants, help clients in choosing among suitable resources and then follow up to ensure that the services provided are appropriate.

Counselors. These workers provide individual and group counseling to help clients with marital difficulties or other problems or in making decisions, such as about career options. Counselors may diagnose and treat mental and emotional disorders. Some specialize in working with specific populations, such as children and families or veterans.

Psychologists. Psychologists diagnose and treat emotional and mental disorders. They provide therapy to individuals, groups, and families. They may design, or assist other human service workers in developing, individual treatment plans for clients.

Social workers. Social workers help clients cope with or solve everyday problems, such as difficulty getting organized. After talking with clients, the social worker may provide strategies to help them modify their behaviors or environments. A social worker also acts as an advocate for clients and refers them to other resources.

Administrative workers

Administrative workers provide the management and support necessary for a human service organization to function. Job titles for administrative workers in human services include the following:

Development directors. These workers create their organization's fundraising strategy and supervise fundraising activities. They work with the executive director and program directors to determine funding needs and then meet with potential donors to explain these needs and how donations are used to serve the community. Development directors often supervise other staff members, such as grant writers.

Counselors and psychologists are among the human service workers who deal directly with clients.

Executive directors. Executive directors oversee the operation of human service organizations. They perform high-level administrative tasks that range from budgeting to human resources management. Much of their time is spent meeting with policymakers, community leaders, and others interested in their organization and its programs. Executive directors also are responsible for setting the organization's goals and for ensuring that staff members work toward those goals.

Grant writers. Grant writers research sources of funding for which their organizations are eligible. They prepare and maintain records regarding applications, funding received, and how funds are spent.

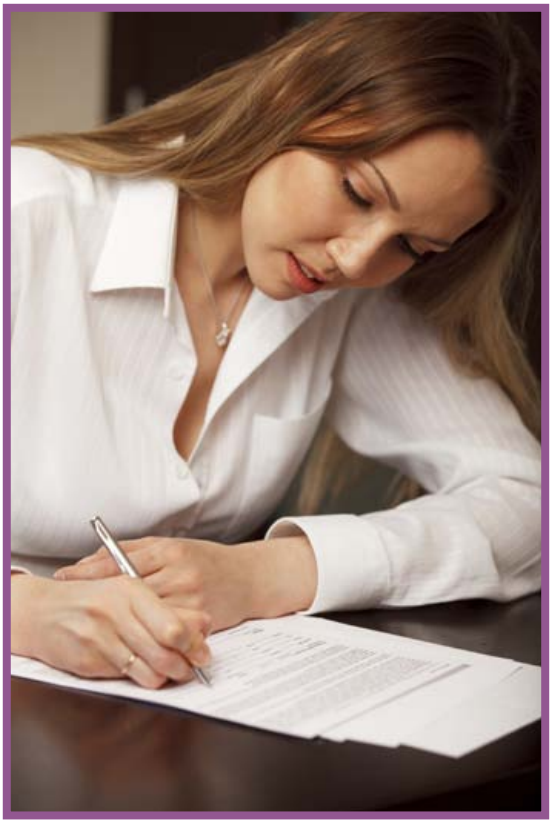
Program directors. These workers design and implement human service programs. They assess the needs of the population that their organization serves and create programs to meet those needs. Program directors supervise staff members and ensure that the program meets state and federal criteria for service providers. These workers also may be responsible for collecting data that are used to evaluate the effectiveness of their programs.

Ups and downs of human service work

Human service work is both rewarding and challenging. Like most careers, however, the suitability of workers for these jobs varies by individual. "It's wonderful work," says Carol Goertzel, president and chief executive officer of human service agencies in Holmes, Pennsylvania, "but it's not for everybody."

Human service workers help clients improve their lives, and it's satisfying to see results over time. These results are often dramatic and show how much people can accomplish when they get professional help. "Anyone who expects big results within short periods of time is asking a lot from people who've had no support," Goertzel says. "We see people make incredible changes."

Most human service workers build relationships with their clients out of concern



Grant writers prepare and maintain records regarding grant applications, any funding received, and how funds are spent.

and a desire to help, aware that clients don't always express their gratitude. "You can't expect people to say, 'Thank you so much. You helped me today,'" Goertzel says.

As the U.S. population grows, so will the demand for the kinds of help human service agencies provide. However, financial resources available to these organizations do not grow as quickly as the demand for services, increasing competition among agencies seeking funds from the same donors. Human service workers are often asked to provide additional services without having access to additional resources. Some workers find the resulting stress difficult to manage.

Much of a human service organization's budget is based on highly unpredictable charitable donations. Because wages are usually tied to this variable budget, workers in human service jobs tend to earn less than those in occupations requiring similar levels of education.

The U.S. Bureau of Labor Statistics (BLS) does not collect employment and wage data specifically on human service workers.

However, BLS does collect data on occupations—including several types of counselors, psychologists, and social workers—in which workers provide human services in the social assistance industry. (See table below.)

Few human service workers pursue these careers solely for the income, though. Workers cite a passion for the field, noting that human service jobs provide opportunities to help people in need and to find solutions to community problems.

Getting into human services

People are drawn to human services for different reasons. Backgrounds vary, but personal experience is sometimes a motivator. Jackson, for example, says that surviving domestic violence stirred her desire to help others. "My philosophy is that I went through what I went through for a reason," she says. "My role is to help people."

Jobs in human services are based on the client population served. Workers who enter these occupations often have similar skills, although their education levels may vary.

Skills

"Human service workers are trained with a core set of skills that they can apply anywhere," says the University of Illinois' Headman. Chief among these are interpersonal and communication skills, because most workers deal directly with a variety of people. Building relationships with clients involves listening to a client's problems, needs, and concerns and communicating solutions, treatments, or services for them. In addition, human service workers must work well on teams because

Employment and wages for selected human service workers in social assistance, May 2010

Occupation	Employment[1]	Annual median wage[2]
Counselors		
Substance abuse and behavioral disorder counselors	14,190	$36,790
Educational, guidance, school, and vocational counselors	20,930	35,370
Marriage and family therapists	10,880	41,320
Mental health counselors	24,000	37,410
Rehabilitation counselors	50,730	29,650
Counselors, all other	6,360	33,170
Psychologists		
Clinical, counseling, and school psychologists	8,000	$56,080
Social and human services		
Social and human service assistants	130,210	$26,550
Social workers		
Child, family, and school social workers	76,180	$34,640
Healthcare social workers	18,880	38,910
Mental health and substance abuse social workers	25,410	35,720
Social workers, all other	13,880	36,340

[1] Estimates do not include self-employed workers.
[2] The median is the wage at which half of workers earned more and half earned less.

Human service workers should be empathetic and able to communicate well.

they often collaborate with others in their field.

Human service workers also need analytical skills to help clients develop strategies to solve problems. The ability to think creatively helps workers determine ways to get around hurdles that interfere with clients' efforts to succeed.

In addition, human service workers should be compassionate and patient. Most of their clients are in stressful situations, so it is important for these workers to be empathetic and sensitive to their clients' emotional needs.

Education

Educational requirements in human service organizations vary with the type of work performed. However, many human service workers have some kind of postsecondary degree. The education level usually ranges from an associate's degree to a master's degree, depending on workers' titles.

At all education levels, degrees are offered in human services, counseling, social work, and psychology. Most programs require some fieldwork, such as an internship, so that students get practical experience working with clients. The level of education generally dictates the type of work someone may perform and the amount of responsibility he or she may be given.

Associate's degree. Human service workers with an associate's degree often perform entry-level tasks. They spend most of their time interviewing new clients and managing details of cases. They help connect clients with appropriate resources and complete any required paperwork.

Bachelor's degree. Those who have a bachelor's degree spend much of their time managing client cases, just as workers with an associate's degree do. They also provide some clinical support.

Master's degree. Workers with a master's degree focus primarily on clinical work, providing counseling to clients. In some states or settings, these workers may need to be supervised by a licensed professional—such as a psychologist, social worker, or counselor—or they may be required to hold a license themselves.

For more information

Your local library may have books and periodicals about human service work. To learn more about specific occupations, consider visiting human service organizations to ask about opportunities for gaining experience, such as internships, job shadowing, and informational interviewing.

Another source of information about hundreds of occupations is the *Occupational Outlook Handbook*. The *Handbook* provides detailed information about occupations with tasks that are similar to those of human service workers. In addition to more detailed information about counselors, social workers, and psychologists—all of which were described briefly in this article—related *Handbook* occupations include social and community service managers, health educators, and social and human service assistants. The *Handbook* is available in many public libraries and career centers or online at **www.bls.gov/ooh**.

Several associations also have information specific to careers in human services. Contact the following organizations to learn more:

National Organization for Human Services
5314 Old Highway 5
Suite 206 #214
Woodstock, GA 30188
(770) 924-8899
www.nationalhumanservices.org

National Human Services Assembly
1319 F St., NW
Suite 402
Washington, DC 20004
(202) 347-2080
www.nationalassembly.org

Council for Standards in Human Service Education
2118 Plum Grove Rd.
#297
Rolling Meadows, IL 60008
www.cshse.org

Coming soon: 2010–20 projections!

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- Data in graphic format (winter 2011–12 *Occupational Outlook Quarterly*)
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- Links to 2010–20 projections highlights (February news release)
- Completely revised online edition of *Occupational Outlook Handbook* (spring 2012)

See first links online February 1, 2012, at **www.bls.gov/emp**.

You're a *what*?

Psychometrician

Elka Maria Torpey

Catherine McClellan knows how to ace the test. That's because she designed it.

Catherine is a psychometrician. Like many in this occupation, she designs, scores, and analyzes data from exams.

Psychometrics is the science of measuring psychological attributes, such as intelligence or understanding. Tests are one way to assess these intangible qualities. And psychometricians' work ensures that each test is reliable and that all test results are valid.

Specific job tasks vary with the type of exam a psychometrician develops. Catherine specializes in constructed response, a form of testing that includes essays, art portfolios, and other tests scored by humans. Other psychometricians develop computer-scored exams.

When creating a test, psychometricians might start by determining its basic structure: which format to use, such as multiple-choice or short-answer questions; how many questions to ask; and the levels of difficulty of the questions. Psychometricians then set the time that will be allotted to take the test and make decisions about scoring, such as how many points to assign each question.

Like most psychometricians, Catherine works with subject-matter experts to identify what a test taker should know to be competent in a particular discipline. The subject-matter experts write questions and answers. Then, everyone works together to make sure that the test covers the right material and conforms to the plan. For Catherine, collaborating with these specialists is among the best parts of her job. "It's endlessly fascinating because I get to work with such a wide range of people," she says.

After new test content has been created, psychometricians make sure that it is sound. They might do this by conducting pilot trials—essentially, a test of the test. "We go out and have people respond to the questions, and then we analyze the data to see if the test is working," says Catherine. Often, she says, a good test points out differences in test takers' abilities.

Catherine spends a lot of time training and overseeing the people who score the exams, too, to be sure that they are grading the exams fairly. One way she verifies that raters are following the proper guidelines is to randomly insert prescored tests into the group of tests that a rater has to score. If the rater's result matches the already assigned score, it's an indication that he or she is following the right procedures.

Psychometricians also analyze test results. For example, they make scores comparable from different versions of a test. And they use score data to create reports or make recommendations—such as suggesting curriculum changes for improving student performance.

Many of the assessments that psychometricians work on have significant implications for test takers. Some psychometricians, for example, design the licensure exams that give teachers, lawyers, and others permission to work in their fields. Other psychometricians design instruments to evaluate factors ranging from career interests to mental health, all of which can affect decisions about the future.

Elka Maria Torpey is an economist in the Office of Occupational Statistics and Employment Projections, BLS. She is available at torpey.elka@bls.gov.

Photo courtesy of Catherine McClellan

Still other psychometricians, including Catherine, create tests that measure student aptitude or knowledge. Results of these tests can influence a student's options for college or a school's level of funding. "This is high-stakes stuff," says Catherine of her work. "Sometimes, I think, 'Wow, this changes people's lives.'"

Helping to shape people's futures through objective measurement requires lots of math and statistics. For example, psychometricians use math to calculate test takers' percentile rankings. And they use statistics to determine variances, correlations, and other measures of a test's reliability.

Psychometricians need good communication skills to explain the results of their work to others. And attention to detail is essential.

Problem-solving and research skills also are important. When choosing statistical methods to assess a test's validity, for example, Catherine might need to do significant research. "If I don't like one method, I need to research what to do to develop a better one," she says. "It rarely ever gets routine."

Most psychometricians work for testing companies and for federal, state, or local government. Other employers include hospitals, mental health clinics, universities, and large corporations. Catherine works for a nonprofit testing company that produces and scores well-known assessments such as the SAT Reasoning Test, Advanced Placement (AP) exams, and Graduate Record Examination (GRE).

The U.S. Bureau of Labor Statistics does not collect employment or wage data specifically on psychometricians. According to the Psychometric Society, however, there are several thousand of these workers in the United States. The Society estimates that annual wages can range from about $50,000 to $100,000, although some workers earn more.

Workers' pay is high, in part, because of the investment required to become proficient in the field. Many psychometricians have a Ph.D., usually in a subject such as educational measurement, quantitative psychology, or statistics. Others have a master's degree. There are no undergraduate programs specifically in psychometrics and only a few graduate-level ones. Most people enter the discipline from a related field, such as statistics, mathematics, computer science, or psychology.

A former math teacher, Catherine first learned about the occupation while earning her master's degree in secondary math education. "I really liked my measurement classes, and one day my teacher told me, 'You know, you can get a degree in this.'" Catherine completed her math education program and then went on to get her Ph.D. in research and evaluation methodology in education. She has since worked on numerous projects, including a nationwide assessment of U.S. students' academic knowledge and experiences.

Catherine enjoys the role she now has in improving education through exams. "I take what I do very seriously," she says. "By helping to make a good test, you feel like you can change things for the better."

Psychometricians, such as Catherine McClellan, above, use statistics to determine whether a test is reliable.

OOChart

Quits versus layoffs

When workers and employers go their separate ways, who usually initiates the split? Data from the U.S. Bureau of Labor Statistics (BLS) suggest that the answer has a lot to do with the overall state of the economy.

As the chart shows, when workers leave a job, it's usually because they choose to quit. At least, that's been the case over most of the 10 years BLS has been collecting such data.

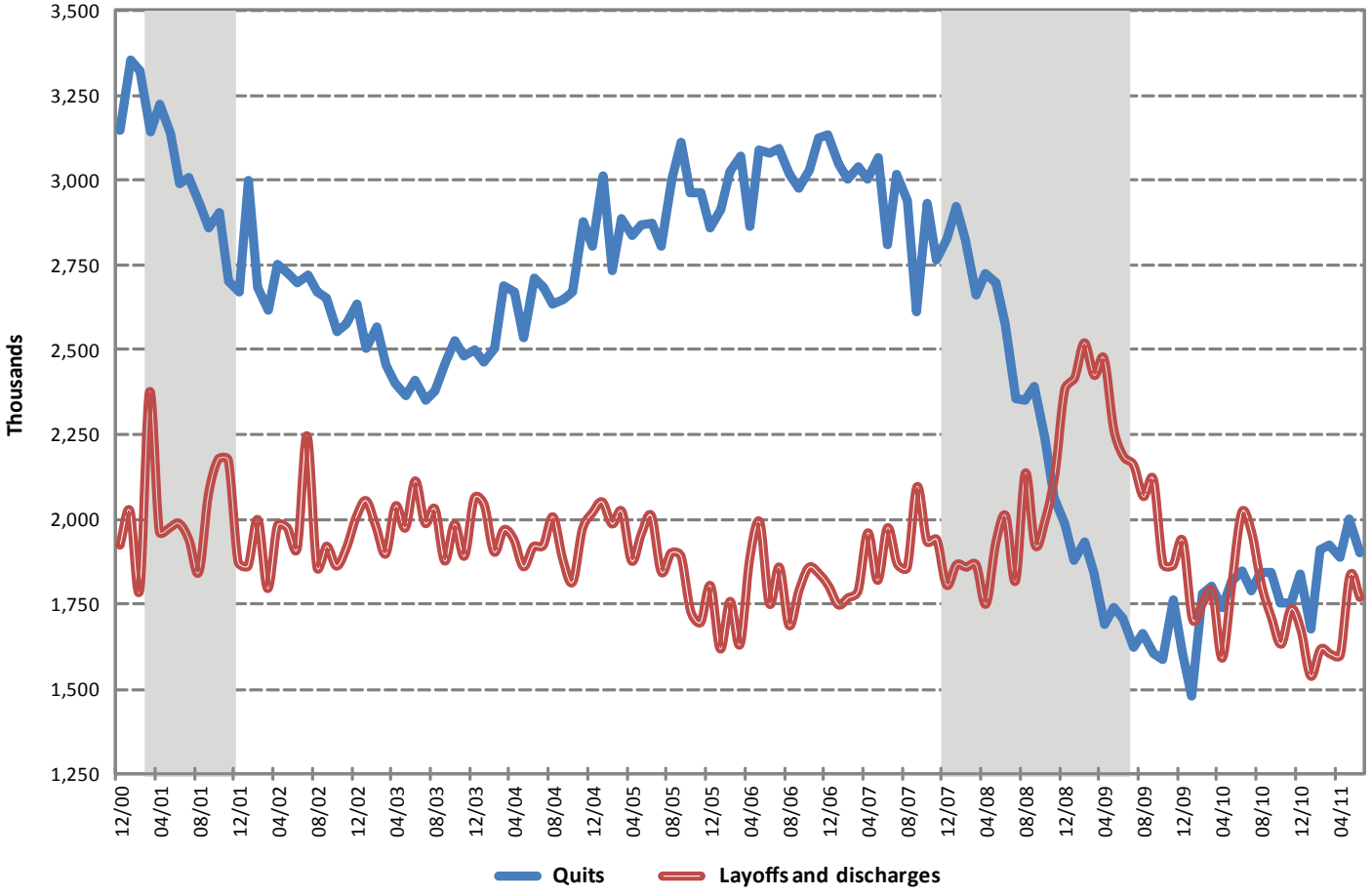
But workers quit less, either by choice or by necessity, during the past two recessions. And the decline in quits associated with the most recent recession was especially dramatic: Quits fell by more than half. This dropoff was accompanied by an unprecedented spike in the number of involuntary separations—the first time since the data series began, in fact, that involuntary separations outnumbered quits.

Quits tend to increase when jobs are perceived as readily available and tend to fall when jobs are perceived as scarce. In the past decade, quits have been a lagging indicator at the start of a recovery.

In contrast, layoff and discharge levels fluctuate for a variety of reasons. Some, such as firings for cause, occur in all economic climates. But others, such as business closures, cost-cutting layoffs, and downsizing, are more closely associated with recessions.

These data are from the BLS Job Openings and Labor Turnover Survey. For more information, write to Job Openings and Labor Turnover Survey, 2 Massachusetts Ave., NE, Suite 4840, Washington, DC 20212; call (202) 691-5870; or visit the program's website at **www.bls.gov/jlt**.

Quits versus layoffs and discharges, seasonally adjusted, December 2000 to June 2011



Note: Shaded areas denote recessions as determined by the National Bureau of Economic Research (NBER).
Source: U.S. Bureau of Labor Statistics and NBER.

Considering careers? Dare to dream.
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Helping those in need: Human service workers

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