Science Technicians

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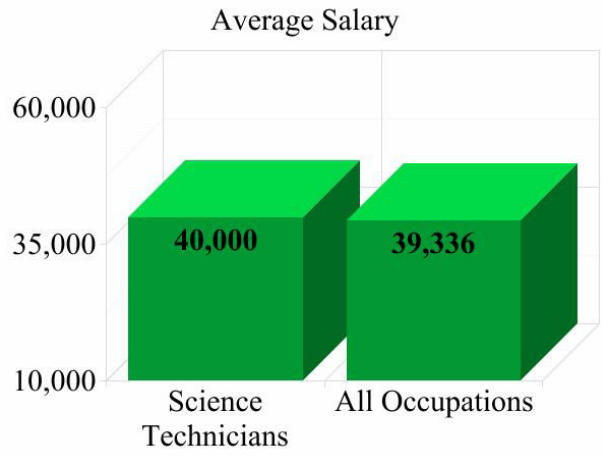
WHAT THEY DO

Science technicians use the principles and theories of science and mathematics to assist in research and development and to help invent and improve products and processes. However, their jobs are more practically oriented than those of scientists.

Technicians set up, operate, and maintain laboratory instruments, monitor experiments, make observations, calculate and record results, and often develop conclusions. They must keep detailed logs of all of their work. Those who perform production work monitor manufacturing processes and may ensure quality by testing products for proper proportions of ingredients, for purity, or for strength and durability.



As laboratory instrumentation and procedures have become more complex, the role of science technicians in research and development has expanded.

In addition to performing routine tasks, many technicians, under the direction of scientists, now develop and adapt laboratory procedures to achieve the best results, interpret data, and devise solutions to problems. Technicians must develop expert knowledge of laboratory equipment so that they can adjust settings when necessary and recognize when equipment is malfunctioning.

Most science technicians specialize, learning their skills and working in the same disciplines in which scientists work. Occupational titles, therefore, tend to follow the same structure as those for scientists.

EDUCATION REQUIRED

There are many ways to qualify for a job as a science technician. Most employers prefer applicants who have at least 2 years of specialized postsecondary training or an associate degree in applied science or science-related technology. Some science technicians have a bachelor's degree in the natural sciences, while others have no formal postsecondary education and learn their skills on the job.

Some science technician specialties have higher education requirements. For example, biological technicians often need a bachelor's degree in biology or a closely related field. Forensic science positions also typically require a bachelor's degree, either in forensic science or another natural science. Knowledge and understanding of legal procedures also can be helpful. Chemical technician positions in research and development also often require a bachelor's degree, but most chemical process technicians have a 2-year degree instead, usually an associate degree in process technology.

Many technical and community colleges offer programs in a specific technology or more general education in science and mathematics. A number of associate degree programs are designed to provide easy transfer to bachelor's degree programs at colleges or universities. Technical institutes usually offer technician training, but they provide less theory and general education than community colleges. The length of programs at technical institutes varies, although 1-year certificate programs and 2-year associate degree programs are common. Some schools offer cooperative-education or internship programs, allowing students the opportunity to work at a local company or some other workplace while attending classes during alternate terms. Participation in such programs can significantly enhance a student's employment prospects.

Whatever their formal education, science technicians usually need hands-on training, which they can receive either in school or on the job. Job candidates with extensive hands-on experience using a variety of laboratory equipment, including computers and related equipment, usually require only a short period of on-the-job training. Those with a high school diploma and no college degree typically have a more extensive training program where they work as trainees under the direct supervision of a more experienced technician.

People interested in careers as science technicians should take as many high school science and math courses as possible. Science courses taken beyond high school, in an associate or bachelor's degree program, should be laboratory oriented, with an emphasis on bench skills. A solid background in applied chemistry, physics, and math is vital.

Science Technicians - Continued

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OTHER USEFUL SKILLS

Communication skills are important because technicians are often required to report their findings both orally and in writing. In addition, technicians should be able to work well with others. Because computers often are used in research and development laboratories, technicians should also have strong computer skills, especially in computer modeling. Organizational ability and skill in interpreting scientific results are important as well, as are high mechanical aptitude, attention to detail, and analytical thinking.

HOW TO ADVANCE

Technicians usually begin work as trainees in routine positions under the direct supervision of a scientist or a more experienced technician. As they gain experience, technicians take on more responsibility and carry out assignments under only general supervision, and some eventually become supervisors. Technicians who have a bachelor's degree often are able to advance to scientist positions in their field after a few years of experience working as a technician or after earning a graduate degree.

WORK ENVIRONMENT

Science technicians work under a wide variety of conditions. Most work indoors, usually in laboratories, and have regular hours. Some occasionally work irregular hours to monitor experiments that cannot be completed during regular working hours. Production technicians often work in 8-hour shifts around the clock. Others, such as agricultural, forest and conservation, geological and petroleum, and environmental science and protection technicians, perform much of their work outdoors, sometimes in remote locations.

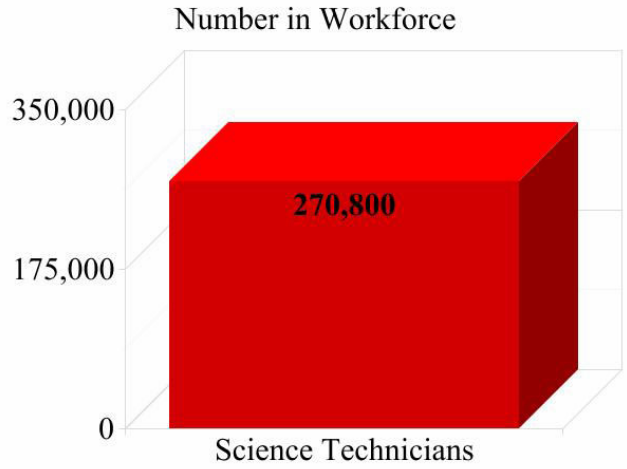
Advances in automation and information technology require technicians to operate more sophisticated laboratory equipment. Science technicians make extensive use of computers, electronic measuring equipment, and traditional experimental apparatus.

Some science technicians may be exposed to hazards from equipment, chemicals, or toxic materials. Chemical technicians sometimes work with toxic chemicals or radioactive isotopes; nuclear technicians may be exposed to radiation, and biological technicians sometimes work with disease-causing organisms or radioactive agents. Forensic science technicians often are exposed to human body fluids and firearms. However, these working conditions pose little risk if proper safety procedures are followed. For forensic science technicians, collecting evidence from crime scenes can be distressing and unpleasant.

JOB GROWTH

Overall employment of science technicians is expected to grow by 12 percent during the 2008–18 decade, about as fast as the average for all occupations. The continued growth of scientific and medical research—particularly research related to biotechnology—will be the primary driver of employment growth, but the development and production of technical products should also stimulate demand for science technicians in many industries.

Employment of biological technicians should increase by 18 percent, faster than average, as the growing number of agricultural and medicinal products developed from the results of biotechnology research boosts demand for these workers. Also, an aging population and continued competition among pharmaceutical companies are expected to contribute to the need for innovative and improved drugs, further spurring demand. Most growth in employment will be in professional, scientific, and technical services and in educational services.



Job growth for chemical technicians is projected to decline by 1 percent, signifying little or no change. The chemical manufacturing industry, except pharmaceutical and medicine manufacturing, is anticipated to experience a decline in overall employment as companies downsize and turn to outside contractors and overseas production. However, there will still be a need for chemical technicians, particularly in pharmaceutical research.

Employment of environmental science and protection technicians is expected to grow much faster than average, at a rate of 29 percent; these workers will be needed to help regulate waste products; to collect air, water, and soil samples for measuring levels of pollutants; to monitor compliance with environmental regulations; and to clean up contaminated sites. Most of this growth is expected to be in firms that assist other companies in environmental monitoring, management, and regulatory compliance.