



TEXAS CTE *In Action*

A College and Career Planning Guide

A HEALTHY FUTURE

**[YOUR GUIDE to CAREERS
in HEALTH SCIENCE]**

- Showcasing 25 Careers
- High School Personal Graduation Plans
- Inside College Admissions



Dear Texas Student,

You are probably tired of people asking, “What do you want to be when you grow up?” Some students know exactly what they want to do, but most haven’t got a clue. The idea of choosing a career is intimidating, and it feels like it’s far in the future. There’s little time in the commotion of classes, activities, sports, work, and fun to think about what career you want to pursue after graduation from high school or college.

It pays, though, to take the time to think about your future career. The truth is that you’ll save a lot of time and money if you have a direction in life, as opposed to just finishing high school and worrying about it later. It’s really a matter of dollars and sense. If you choose a career direction now, you can select classes and activities that will make you highly marketable—and highly paid—when you look for work. And it only makes sense to have an idea of what you want to do rather than just wandering aimlessly through school.

Nobody wants that. Not your parents. Not your teachers. Not your friends. They want you to be somebody. They want you to use your talents, follow your interests, and pursue your ambitions to become great at what you love to do in life. That’s what you should want, too.

So the time is right to take charge of your life and think about the future. You need a plan of action for how to get from where you are today to where you want to be in a few years: starting out on a personally and professionally rewarding career.

**YOU’VE HEARD
THAT ‘INFORMATION
IS POWER.’ WELL,
THIS GUIDE IS
POWER. IT PUTS YOU
IN CHARGE OF YOUR
FUTURE.**

That’s what Texas CTE is all about. The guide you are holding is one of 16 guides to different career clusters. It is designed to help you make smarter decisions about your education and career options.

You’ve heard the phrase, “Information is power.” Well, this guide is power. It puts you squarely in charge of your future, from creating High School Personal Graduation Plans (see page 5) to choosing college or some other form of education or training after high school. Work with your parents, teachers, and counselors to make decisions, but remind everyone that it is your future at stake and that you are taking charge of it.

Get information. Get a plan. Get a clue about your career direction. It’s alright if that direction changes; choosing a direction now is better than having no direction at all. Just promise yourself that you’ll make smart choices about where to focus your time, energy, and passion.

We’re proud that you are taking steps to plan your career direction, and we pledge that your school, teachers, and counselors will do all they can to help you make wise choices on your plans for success. We wish you the best of luck on your journey.





A Health Science Career

EVERYONE NEEDS HEALTH CARE.

From newborns to seniors, Texans require professionals who are experts at diagnosing and treating disease, using medical technologies, and providing preventive care. Although everyone thinks of doctors and nurses when they contemplate careers in health care, there are hundreds of other specialties available in the Health Science cluster, including technicians, skilled support personnel, dentists, and scientists. In fact, a typical medical center is a giant business with employees as varied as aides and CEOs (chief executive officers). As the baby boomer generation in Texas ages, demand for health services grows, meaning that job security in the cluster is strong. If you feel a calling to care for others, won't faint at the sight of blood, or want to pursue a profession on the cutting edge of technology, then Health Science may be the right career cluster for you.

MORE THAN
460 HOSPITALS
ARE LICENSED IN TEXAS.

HOT Career Areas

Texas has launched a strategic plan that targets state efforts on six industry clusters that economists say will be the engines of economic growth in Texas. As you plan your future, think about a career in one of these new and emerging sectors.

- Advanced Technologies & Manufacturing
 - Molecular technologist
 - Sensor/robotics engineer
- Aerospace & Defense
 - Aerospace engineer
 - Unmanned autonomous vehicle engineer
- Biotechnology & Life Sciences
 - Bioinformatics specialist
 - Biocontainment technician
- Information & Computer Technology
 - System integrator
 - Computer game developer
- Petroleum Refining & Chemical Products
 - Petrochemical engineer
 - Refinery process design engineer
- Energy
 - Wind/solar energy engineer
 - Geophysical (oil and gas) prospector

THE FIRST STEP toward success is making smart decisions about your education and career options.

Plan for Success



When I was in high school," says Sheryl Kovach, a senior human resources generalist with IKON Office Solutions in Houston, "the only job that I even knew about was receptionist work. I didn't aspire to be a manager or entrepreneur because I really didn't know about those disciplines. I was just looking forward to graduating. That was it. I really didn't know what it was I wanted to do."

Sound familiar? You, too, may not have a clue about what to do with your life.

Don't worry, though. Help is right here in your hands. It's one of 16 career cluster guides published by Texas CTE (www.txcte.org). This edition is all about health science.

Let's start with some basic steps you should take to get organized, plan for the future, and start on the road to success.

Assess Your Talents and Abilities

First, you need to figure out some things about yourself. This step can be as simple as writing down a list of your interests (like video games or rock climbing), your hopes and dreams (like helping others), your talents (like writing or math ability), and your weaknesses (if you're squeamish at the sight of blood, for example, you might not want to be a doctor).

Follow up on this informal exercise by taking some formal assessments to determine your interests and abilities. Common assessments

include Texas Genuine (www.texasgenuine.org) and CareerTech (www.careertech.org).

This guide along with other resources will provide you with the tools to begin your career exploration before you enter the ninth grade. It's never really "too early" to think about your career goals.

Ask your principal or counselor about the career assessments available at your school.

Research Your Career Options

Once you've learned about yourself, learn more about your career options. There are thousands of occupations out there of which you may never have heard, and others that do not yet exist because the technologies have not



IN 2012, THERE WERE
8,970 DENTISTS AND
DENTAL SPECIALISTS
IN TEXAS.





been developed. Fortunately, there are plenty of resources (see inside back cover) for you, and they are as close as the nearest computer.

One of the most helpful is the Texas Career Check from the Texas Workforce Commission. It is a vast database of information about hundreds of professions. You can find Texas Career Check at www.texascareercheck.com. Another good place to start is O*NET (www.onetcenter.org).

Gather information about what you can earn in the careers in which you are interested. Find out whether the careers you are considering have a promising future—are they adding or losing jobs? Check out the education you'll need to enter those careers.

The chart on pages 10–11 presents data on 25 possible professions. Remember, though, that these are just a sampling of careers available in the cluster. Go to Texas Career Check, O*NET, or another resource to investigate other careers.

Create Your High School Graduation Plan

Once you have a better idea of your interests and abilities, you are ready to plan for high school and beyond. The High School Personal Graduation Plan, is your plan for preparing for the career of your choice.

First, you should choose a career cluster and an endorsement, not a particular occupational goal. In the eighth grade you might choose health science leading to a Public Services Endorsement and then later become interested in a narrower field such as radiology technician or surgeon.

The program of study you choose—your plan—does not stop with graduation from high school. You could then pursue a two-year degree as an x-ray technician or a four-year degree in radiologist.

You should set up a High School Personal Graduation Plan that takes you through career preparation after high school, revising your blueprint as needed as you go along. If your career plans include college study, ask your counselor about tests required for admission to college, such as the PSAT, SAT, or ACT.

Seek Out Special Programs

Many Texas schools offer innovative programs to prepare students for specific career areas. These include career and technical education (CTE) programs, academies, and magnet schools. Once you've decided on a career direction, ask your counselor about special programs in your area that may provide related experiences in your chosen career.

Samuel Odamah enrolled in the architecture program at the University of Texas at Arlington, having found his calling at Dallas's Skyline Career Development Center, a high school with career programs in a number of different fields.

"Skyline is one of the few schools in the country that offer programs in architecture," Odamah says. "In some careers, Skyline students could even get professional certifications or licenses right in high school. It was a great place because you could find out whether you really wanted to enter a career."

Odamah says that the career cluster system at Skyline taught him the value of planning for his career and his life. "We learned about planning ahead," he says. "Those who plan things ahead of time don't have to catch up. It's just a matter of what a person wants out of life. Planning gives you a better platform for success."

Health Science CTSOs

One of the best ways to acquire experience in your chosen career is by joining a career and technical student organization (CTSO). In health science, the most helpful CTSOs are:

- Business Professionals of America (BPA)
www.texasbpa.com
- Family, Career and Community Leaders of America (FCCLA)
www.texasfccla.org
- Future Business Leaders of America (FBLA)
www.fblatx.org
- Health Occupations Students of America, Texas Association (HOSA)
www.texas-hosa.org
- Texas Technology Students Association (TSA)
www.texastsa.org



WHAT ARE Career Clusters & Programs of Study ?

In Texas, High School Personal Graduation Plans will guide students’ high school and college experiences (see next page). As part of this process, students focus their studies within a chosen career cluster and program of study that lead to an endorsement.

A career cluster is a group of occupations and broad industries that share certain features. The Health Sciences cluster, for example, includes physician and dentist. Texas has adopted 16 Career Clusters (see back cover), the same ones designated and developed by the U.S. Department of Education.

As the graphic below shows, within each cluster are programs of study, which are more specific groupings of similar occupations. Think of a program of study as being like a college major. In Health Science, you might choose to focus on Therapeutic Services in high school and college.

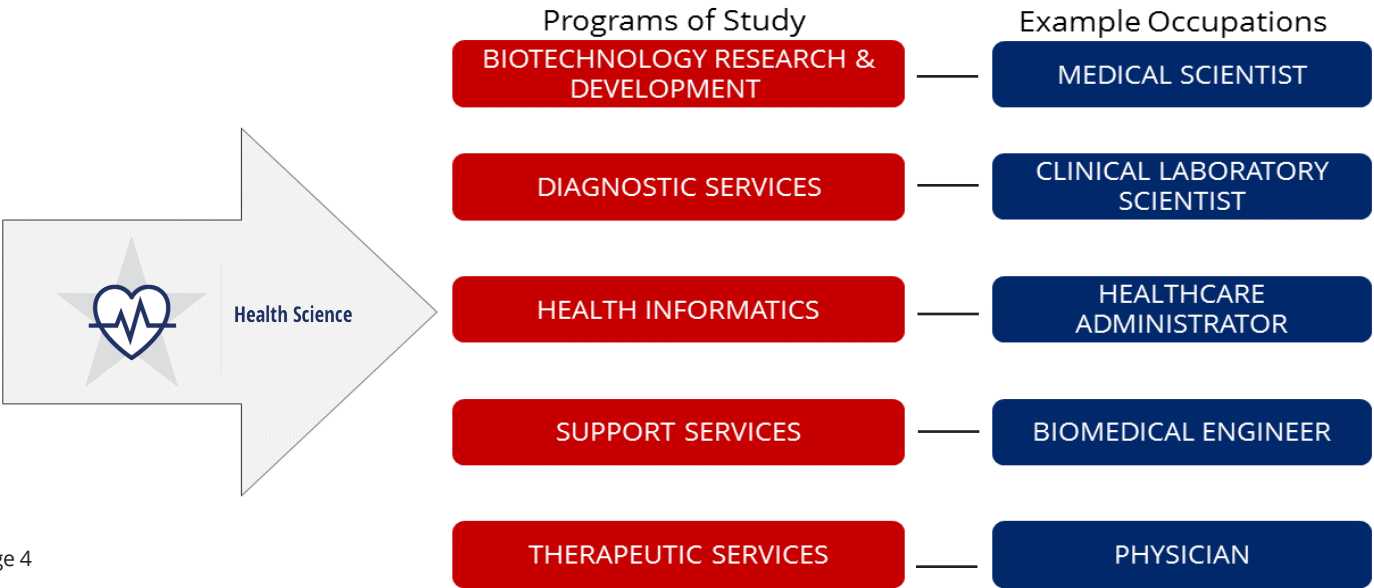
Related Occupations

Each career pathway in a particular cluster includes a range of related occupations; physician is an example of an occupation that falls within Therapeutic Services.

Choosing a career cluster and career pathway will help you acquire the knowledge and skills you’ll need to enter your chosen career. It will allow you to follow a seamless course of study from high school into college or other postsecondary education or training. The electives you choose can complement your core academic classes to prepare you for the challenges of the real world of work

Review Your High School Personal Graduation Plan Each Year

Don’t get locked into a cluster and program of study you don’t like. You should reexamine your 4-year plan at least once a year and change programs or clusters if your interests have changed. Choosing a cluster and program of study, even if it changes later, means that you’ll have a direction in life. The idea is to be aware of what’s going on in your life and take control of your future. When you know where your education is going and why, your classes will become more meaningful. You’ll make contact with students, teachers, and employers who share your interest in a particular career area. You’ll have experiences that are fun and exciting. You’ll be on your way to success in school, in a career, and in life.





WHAT IS A High School Personal Graduation Plan?



It's a smart idea to create a High School Personal Graduation Plan, or 4-year plan, to guide your studies through high school and into college or other postsecondary education or training. Your 4-year plan represents your chance to take control of your education and career choices. Working with your parents/guardians and guidance counselor, you can pick the cluster on which you want to focus your studies as well as your career and

postsecondary education goals. Don't worry. You aren't locked into your choices. You should revisit your 4-year plan at least once a year to update it. You can change clusters, programs of study, and career and postsecondary goals as your interests and ambitions change. Having a plan—even if it changes—is smarter than having no idea of what you want to do and why you are attending school. Here's how to fill out your 4-year plan.

CHOOSE a career cluster on which to focus your high school and college or postsecondary studies. The idea is to offer you a seamless route to follow from high school, through college or other postsecondary education, and into a career. Not all Texas schools offer all clusters, so ask your guidance counselor which clusters are available at your school.

LIST basic information such as your name and school.

PICK a program of study within the cluster. There are five programs within the Health Science cluster (see page 12).

CHOOSE one or more occupations for which you would like to prepare. Use resources such as Texas Career Check (www.texascareercheck.com) to research your options.

PLAN for what you want to do after high school. Your goal may be to attend a four-year university or two-year college, join the military, or enter an apprenticeship program. Your postsecondary goal should influence the classes you take in high school; for example, you will need certain course credits to qualify for admission to a college.

SKETCH out your schedule of classes for your high school years. You will spend time completing requirement for the Foundation High School Program including electives to earn your endorsement in Public Services (26 credits). Planning your 4-year plan will help you get the education and experience you need to start your postsecondary and career goals.

PICK extended learning activities that complement your classes (see page 14). Work on community service projects. Plan for paid and unpaid career learning experiences, such as job shadowing and internships. All these extracurricular activities can give you experience that will help you get into college or land a job.

High School Personal Graduation Plan

Name: Taylor Jones, West High School
Endorsement: Public Services
Cluster: Health Science
Program of Study: Therapeutic Services
Career Goal: Physician
Postsecondary Goal: M.D. Degree in Family Medicine

Foundation High School Program Requirements (22)	Public Services Endorsement Requirements (26)								
English Language Arts (4 Credits) <ul style="list-style-type: none">English IEnglish IIEnglish IIIAdvanced English Course Mathematics (3 Credits) <ul style="list-style-type: none">Algebra IGeometryAdvanced Mathematics Course Science (3 Credits) <ul style="list-style-type: none">BiologyIPC or Advanced Science CourseAdvanced Science Course Social Studies (3 Credits) <ul style="list-style-type: none">U.S. HistoryU.S. Government (one-half credit)Economics (one-half credit)World Geography or World History Physical Education (1 Credit) <ul style="list-style-type: none">World Geography or World History Languages Other Than English (2 Credits in same language) <ul style="list-style-type: none">Fine Arts (1 Credit)Career Related Electives (5 Credits)Proficiency in Speech (Determined locally)	Math (1 Additional Credit) Science (1 Additional Credit) Career Related Electives (2 Additional Credits) EXAMPLE CAREER RELATED ELECTIVES <table><tr><td>Principles of Health Science</td><td>Anatomy and Physiology</td></tr><tr><td>Health Science</td><td>Child Development</td></tr><tr><td>Medical Terminology</td><td>Medical Microbiology</td></tr><tr><td>Lifetime Nutrition &</td><td>World Health Research</td></tr></table> DISTINGUISHED LEVEL OF ACHIEVEMENT <p>4 Credits in Mathematics (Must complete Algebra II) 4 Credits in Science Requirements for at least the Public Services Endorsement</p> PERFORMANCE ACKNOWLEDGMENT <p>Outstanding performance<ul style="list-style-type: none">in a dual credit coursein bilingualism and biliteracyon an AP test or IB examon the PSAT, the ACT-Plan, the SAT, or the ACTEarning a nationally or internationally recognized business or industry certification</p>	Principles of Health Science	Anatomy and Physiology	Health Science	Child Development	Medical Terminology	Medical Microbiology	Lifetime Nutrition &	World Health Research
Principles of Health Science	Anatomy and Physiology								
Health Science	Child Development								
Medical Terminology	Medical Microbiology								
Lifetime Nutrition &	World Health Research								

Curricular Experiences: Health Occupations Students of America (HOSA), NASA Research Program, STARS Research Program
Extracurricular Experiences: Academic Decathlon, Medical Mission Trips, National Youth Leadership Forum on Medicine, Special Olympics, UIL
Career Learning Experiences: Career Preparation—Paid and Unpaid, Internships, Job Shadowing
Service Learning Experiences: Community Service Volunteer

A CAREER PORTFOLIO (see page 15) is a good way to organize information about your educational experiences, record results of career interest and abilities assessments, and hold examples of your best work. Include a 4-year plan in your portfolio.



Health Science Futures

Medical advances and rising demand are creating exciting opportunities in HEALTH SCIENCE.

To be successful in health science," says Cora Lahey, health science instructor at McNeil High School in Austin, "one needs to be patient and detail-oriented, have an excellent work ethic and a great sense of responsibility."

Health science is serious business, but if a student has what it takes to succeed, the cluster offers a vast array of career possibilities. Exciting research in medical technology, including that involving robotic parts that can be installed directly into the recipient's existing muscles, medicines tailor-made for a person's specific DNA, and pill-sized cameras recording internal views of a patient's digestive tract, is opening new possibilities for healing and new opportunities for students with an interest in science. At the same time, the increasing healthcare needs of an aging Texas population is driving the demand for well-trained medical professionals.

Limitless Opportunity

"As medical technology advances and the demand for a higher level of expertise increases, the opportunities in health care become virtually limitless," says Renee Tonquest, curriculum specialist at the University of North Texas in Denton.

According to the U.S. Department of Labor's Bureau of Labor Statistics, ten of America's 20 fastest-growing occupations are in health services (Source: Occupational Outlook Handbook, Fastest Growing Occupations, <http://www.bls.gov/ooh/fastest-growing.htm>). The Texas Workforce Commission Report on Texas Growth Occupations says Texas healthcare and social assistance workers are expected to grow 33 percent by 2022, with the greatest increases projected for medical and clinical laboratory technicians and surgical technologists. As the population ages, jobs in this area are expected to grow 40 percent.

The demand for nurses is also increasing. Texas will need as many as 68,730 registered nurses (RNs), licensed vocational nurses (LVNs), and nurse practitioners in the next seven to 10 years. Average annual salaries for RNs are well over \$65,000, with signing bonuses up to \$5,000.

"There is currently an abundance of available work in many specialty areas," says Faith Macienko-Krenck, a certified pediatric nurse practitioner at Rowlett Pediatrics in Mesquite, who adds that students can enter the field at a variety of education levels.

Home health aides can enter the workforce with a high school diploma and short-term on-the-job training. An associate's degree and license qualify RNs for employment. Clinical laboratory scientists require bachelor's degrees, physical therapists need master's degrees. Physicians must earn a doctor of medicine (MD) degree, plus complete years of hands-on training as interns and residents in a particular medical specialty. Pay rates range as widely as educational requirements, from an average of \$9.87 an hour for home health aides to \$116.49 an hour for orthodontists.

10 Fast-Growing Careers

Occupation	Growth Rate (2012-2022)	Avg. Annual Openings(2012-2022)
Registered Nurses	30.3%	48,380
Licensed Practical & Licensed Vocational Nurses	29.4%	17,680
Medical & Health Services Managers	32.1%	4,610
Medical Records & Health Information Technicians	31.6%	4,130
General & Operations Managers	31.0%	4,030
Radiologic Technologists	31.5%	3,940
Medical & Clinical Laboratory Technicians	39.9%	3,920
Dental Hygienists	29.9%	3,500
Surgical Technologists	39.9%	3,500
Physical Therapists	33.5%	3,240

This is a projection of 10 fast-growing careers in health science in Texas from the year 2012 to 2022 and the number of average annual openings in each occupation. Note that while the percentage of growth in jobs may be high, the actual number of jobs created may be low. Source: U.S. Bureau of Labor and Texas Workforce Commission.

10 Top-Paying Careers

Occupation	Average Wage	Entry-Level Wage	Experienced Wage
Orthodontists	\$116.49	\$96.05	\$123.59
Anesthesiologists	\$111.53	\$81.15	\$122.31
Obstetricians & Gynecologists	\$103.47	\$60.69	\$119.88
Surgeons	\$98.77	\$47.98	\$119.53
Internists, General	\$97.25	\$55.36	\$118.20
Psychiatrists	\$91.37	\$43.40	\$115.35
Physicians & Surgeons, All Other	\$90.16	\$34.20	\$118.15
Family & General Practitioners	\$90.16	\$49.90	\$110.28
Dentists, General	\$89.67	\$46.46	\$111.28
Nurse Anesthetists	\$77.93	\$49.48	\$92.15

This is a chart of hourly wages for 10 of the top-paying careers in the Health Science cluster in Texas. Note how entry-level wages are often much lower than pay for the average worker and experienced workers in each profession. Source: Texas Workforce Commission.

Early Opportunities

Lahey says students need to have an early opportunity to sample the variety of health science careers. The high school's health science class prepares students to take exams for pharmacy technician board certification and phlebotomy technician certification. "After high school, the students can apply for work in either field and have a job while in college that pays \$12.50 an hour," says Lahey.

Lahey believes the future looks bright for students and for the future of medical science. "What makes me so optimistic," she says, "is the potential that I see in some of the students. Their generation will answer many of the questions that scientists have been researching for years."

Personal Fulfillment

Health science is not all about money, however. Says Lahey, "A career should be something professionals love to do and have so much fun doing that they sometimes feel a little guilty about taking money." She adds that her career in health science has delivered great personal fulfillment in a variety of occupations.

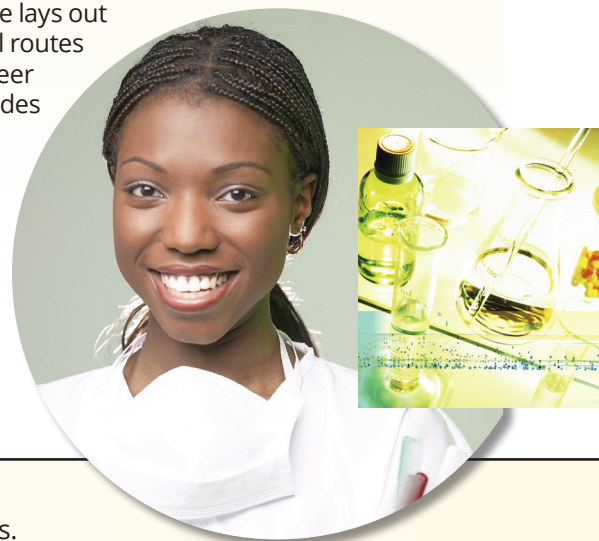
She entered the field as a board certified medical technologist, then added further training in molecular diagnostics. Finally, after more than 15 years as a research scientist and clinical diagnostician, Lahey earned her teacher certification and began preparing another generation of students for medical careers.

Health science professionals often work in a number of different occupations in the course of their careers. "I have worked in multiple roles in health care," says Macienko-Krenck, "and my different assignments have always been engaging."

"There hasn't been a dull moment, either in my work as a teacher or as a research scientist," agrees Lahey. "They are both rewarding careers because they give you the sense that you are making a difference in somebody's life."

TEXAS H.O.T. JOBS

The Texas H.O.T. Jobs website (www.texashotjobs.org) provides an introduction to careers in health science. In addition to descriptions of different professions, the interactive site lets students match their interests, skills, and desired earnings and education levels with particular health careers. The site lays out the educational routes to different career goals and provides links to college and university websites helping students find information on postsecondary programs in Texas.



QUIZ

Is Health Science the right cluster for you?

Take this quiz to find out. Answer "yes" or "no" to the following questions.

1.

Do you like working with people?

2.

Are you interested in science?

3.

Have you ever cared for a sick pet?

4.

When you are working, do you pay close attention to detail?

5.

Do you work well in a team?

6.

Have you ever done volunteer work to help others?

7.

Are you good at solving problems?

8.

Do you enjoy laboratory work in chemistry or biology?

9.

Do you enjoy games like chess that involve strategy?

10.

When you tackle a problem, do you stick with it until you find the answer?

If you answered "yes" to five or more of the above questions, Health Science may be the right cluster for you. To get a more specific and scientific measurement of your attitudes and abilities, ask your guidance counselor or teacher about taking a career assessment test or interest inventory.

What Employers Want

A NURTURING SPIRIT

Sandra Shuya, interim director of nursing at El Paso Community College, says her field "is not for the faint of heart. I look for people who have a nurturing attitude," she says. "They must be caring and giving."

"Because all of our patients are cancer patients," says Ean Rankin, chief executive officer (CEO) of Austin Cancer Centers, "it takes people with great compassion and courage to deal with the problems our patients face."

PATIENCE

"To work in science, one does have to be patient," says Janet Engelkirk, chair of the biotechnology department at the Texas Bioscience Institute at Temple College.

Because healing takes time and effort, health service professionals must be able to persevere. It is crucial, in both patient care and medical research, to be able to stick with a project or task until the goal is reached.

LOVE OF SCIENCE

"I look for someone who loves science," Engelkirk adds. Scientific technology and knowledge are expanding and changing daily. New drugs are discovered, new techniques are perfected, and new equipment is developed at an incredible pace.

Most careers have some element of change, but in health science, it is constant. "With all of the new technology," says Shuya, "changes come quickly and you must enjoy learning."

BASIC KNOWLEDGE

Science education builds on itself, and, if a person's science knowledge is weak, it is impossible for that person to be successful as a health science professional.

Renee Tonquest, curriculum specialist at the University of North Texas, points out that a sound future in health science starts early: "It is critical for students to have a strong background in math and science if they want to succeed in a career in health care."

INTEGRITY

Because people's lives are at stake, health science is a demanding field, Engelkirk says. Professionals in this field must be "very detail oriented, organized, methodical, observant, and have a high level of integrity."



Combine expertise, passion, and attention to detail to build a CAREER IN HEALTH SCIENCE.

Duncanville pharmacist James R. Walters has a philosophy that is typical among those working in health science.

"I really enjoy my job," he says. "I like people and I like being able to help others, especially because I can make such a difference in their choices and health outcomes."

Beth Guthrie, an oncology nurse at Cancer Therapy and Research Center in San Antonio, agrees.

"To work in oncology research, a nurse should have experience in conventional chemotherapy, peripheral IVs, central lines, lab values, communication skills, and, most importantly, a compassionate heart," she says.

Guthrie's compassion is one of the valuable parts of her character which enables her to overcome the challenges presented by working with patients who are fighting for their lives.

"I am collecting numerous blood samples, monitoring vital signs, and performing electrocardiograms (EKGs), as well as observing patients for any adverse

reactions," she says.

It is important to balance the technical aspect of the treatment process with empathy for the patients. After all, "I administer new chemotherapy drugs that possibly will be the cure for certain cancers," she points out.

Effective Communication

Although Guthrie knows communication with patients is important, she also realizes connections are established in various ways. "In our treatment room, we laugh and joke with our patients and they love it," she says. "They are dealing with a terrible disease, and laughter is good medicine for both the patients and the staff."

Marc Bateman, a clinical engineer at Methodist Hospital in Houston, agrees that good interpersonal skills are important in health science. "People in clinical engineering must have good interpersonal skills," he says. "They will deal with many different types of people in stressful situations. For example, doctors and nurses may encounter a broken piece of equipment while treating a patient."

Another element of good



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CENTERS.

communication is the ability to listen, says Walters. "I listen to patients because sometimes that's the best way to assess their condition."

Daily Variety

Because he works with an always changing assortment of improved technologies, Bateman's job is never dull. "I enjoy the variety of work," he says. "There's something new every day. There is always new equipment being developed, such as surgical robots, 3-D ultrasound, and 3-D modeling of organs such as the heart."

Although new equipment gives Bateman's job variety, it also gives him a lot to learn. "There are usually multiple activities or projects going on each day," he says, "such as planning for new equipment being purchased, investigating equipment failures, updating policies to meet new regulations, and planning staffing and workload for the coming months."

Variety comes in a different form for Cheryle Curtis. As a physical therapist for Austin's Eanes Independent School District, Curtis sees a variety of pediatric

patients: "I work with children with physical disabilities, autism, blindness, deafness, and developmental delays."

Curtis finds her career inspiring. She says she is heartened by her patients' resilience. "Children are growing," she points out, "and their nervous systems are pliable and able to adapt."

Openness to New Ideas

Because health science is changing so rapidly, it's crucial for those in the field to stay informed and embrace new ideas.

"I like to look at alternative medical options," says Curtis. "For some conditions, there are many benefits to yoga and acupuncture, for example. They help patients feel less discouraged and more empowered to participate in their own healing process."

Details Matter

Professionals in health science fields must pay careful attention to detail. Mistakes made by physicians, nurses, or laboratory technologists can result in serious harm to patients.

As a pharmacist, Walters knows the

importance of getting his work exactly right. "My specialty is preparing retail prescriptions," he says. "This includes interpreting the prescriptions correctly, phrasing instructions in a way that the patient can understand, determining if there are any potential interactions with the patient's other medications, determining if the dosage is correct, ensuring the proper drug is dispensed, and, finally, counseling the patient."

Walters carries a lot of responsibility in his career, but also reaps substantial rewards. "I fill prescriptions," he says, "but I also help patients make choices in drug therapy or treatments that will improve their lives."



5 Cool Careers

CHECK OUT THESE EXCITING CAREERS IN HEALTH SCIENCE.

1.

RESEARCH NEUROLOGIST

Although the human brain only weighs about three pounds, it defines who we are, what we think, what we crave, and how we smell. So it's no wonder that a number of health scientists have chosen to focus on the way our brains function. Research neurologists study the physiology of the brain, determine how it works, and devise ways to repair it when things go wrong.

2.

CLINICAL LABORATORY SCIENTIST

Physicians rely on laboratory testing to help them diagnose disease. With population growth and the constant development of new tests, employment of clinical lab technologists and technicians is growing quickly. Clinical lab scientists use sophisticated instruments to analyze and examine body fluids and cells. These professionals must be well trained and credentialed to perform their critical role in diagnosis and healing.

3.

GENETICIST

Human genes are a map of who we are as individuals. The wealth of new information being discovered almost daily about the human genome is helping us understand just how we are constructed and how to identify problems, such as breast cancer, before a person even has symptoms. Geneticists are working on ways to use this information to more precisely target drugs and maybe even repair "broken" genes.

4.

COSMETIC DENTIST

Ever wonder why celebrities' teeth are so white and perfect? With so much emphasis on good looks, people are eager to have youthful, healthy-looking grins. Cosmetic dentists can turn brown, uneven teeth into true pearly whites. By repairing chipped, cracked, missing, discolored, or otherwise unattractive teeth, cosmetic dentists help keep the world smiling.

5.

BIOMEDICAL ENGINEER

The healing arts are complex, and sometimes it takes a combination of biological and mechanical expertise to overcome disease. Biomedical engineers design the artificial organs, limbs, and technical devices that make this possible. Their instrumentation may replace natural structures that have been damaged or help doctors "see" what is going on inside the body without having to perform an operation.

Health Science

Listed below are 25 careers you might consider in the Health Science cluster. These are not all the to you at different education levels. Turn to the “Online Info” on the inside back cover to research a ambitions. Here’s an explanation of the kind of information presented in each column.

● **SOC:** Stands for Standard Occupational Code, which organizations like the U.S. Department of Labor use to categorize career information. Sometimes you can find data on a career faster by searching for its SOC.

● **GROWTH:** This is the projected annual growth in Texas for the career between 2012 and 2022. Fast-growing occupations may offer greater career opportunities for young adults.

● **OPENINGS:** This is the projected number of job openings for the career in Texas each year. Even though a career may be fast growing, there may not be a lot of positions available. Careers with more openings will give an entry-level worker a better chance of getting a job and greater job security.

● **WAGES:** This is the amount the average person in the career earns in Texas per year. Naturally, entry-level wages are lower than the average, and those for workers with years of experience are generally higher.

SOC	Occupation	Growth	Openings	Wages	Education
29-1062	Family and General Practitioner	20%	290	\$187,525	First professional degree
29-1020	Dentist, General	13%	340	\$186,517	First professional degree
19-1041	Epidemiologist	18%	15	\$60,901	Master's degree
29-1121	Audiologist	37%	55	\$65,449	Master's degree
29-1127	Speech-Language Pathologist	26%	485	\$73,048	Master's degree
29-1123	Physical Therapist	32%	660	\$90,897	Master's degree
11-9111	Medical and Health Services Manager	30%	1,045	\$96,616	Bachelor's plus experience
29-1071	Physician Assistant	44%	340	\$102,261	Bachelor's degree
29-1031	Dietitian and Nutritionist	30%	170	\$54,862	Bachelor's degree
29-2091	Orthopedist and Prosthetist	40%	30	\$56,910	Bachelor's degree
29-1111	Registered Nurse	28%	9,020	\$67,855	Associate's degree
29-2012	Medical and Clinical Laboratory Technician	37%	720	\$36,621	Associate's degree
29-1124	Radiation Therapist	30%	40	\$81,869	Associate's degree
29-2034	Radiologic Technologist and Technician	30%	595	\$53,488	Associate's degree
29-2032	Diagnostic Medical Sonographer	58%	310	\$65,488	Associate's degree
29-2033	Nuclear Medicine Technologist	31%	55	\$68,932	Associate's degree
29-2071	Medical Records and Health Information Technician	30%	920	\$37,020	Associate's degree
31-9011	Massage Therapist	23%	300	\$36,694	Postsecondary award
29-2054	Respiratory Therapy Technician	29%	55	\$50,678	Postsecondary award
29-2061	Licensed Practical and Licensed Vocational Nurse	28%	3,735	\$43,726	Postsecondary award
29-2081	Optician, Dispensing	20%	275	\$30,768	Long-term on-the-job training
29-2052	Pharmacy Technician	28%	1,040	\$31,849	Moderate-term on-the-job training
29-2051	Dietetic Technician	26%	40	\$28,905	Moderate-term on-the-job training
29-2053	Psychiatric Technician	22%	100	\$27,134	Moderate-term on-the-job training
29-2041	Emergency Medical Technicians & Paramedics	29%	830	\$33,453	Moderate-term on-the-job training

Source:
Texas Workforce
Commission (TWC)

Note: This chart is a sampling of careers in the cluster, not recommendations from TWC or any other agency or organization. Always do thorough research and consult with your parents/guardians before making a career choice.


























career options in the cluster—they are just a sampling showing the variety of occupations available
all career options in the cluster of your choice and decide on the ones that best fit your talents and

EDUCATION: This is the minimum preferred level of educational attainment for people working in the career in the United States. This can range from short-term on-the-job training to a doctoral degree taking several years of college.

EDUCATION LEVELS: The color bars show the mix of education levels attained by people actually working in the profession in Texas (see bars at right). If a bar features mostly one color, that means that level of education is likely the one you'll need to reach to work in the profession. Look at family and general practitioner, for example, and you'll see that virtually all the people in the field have a college degree or better. If the three colors in the bar are roughly equal in size, that means that there are opportunities in the profession for people of all education levels. For example, about 18 percent of the people working as massage therapists have a high school diploma, 47 percent have some college, and 35 percent have four-year degrees or better.

JOB DESCRIPTION: These are brief descriptions of each career from O*NET Online (online.onetcenter.org).

High School	Some College	College or Better
Percentage of people in the occupation who have at most high school diplomas	Percentage of people in the occupation who have some college	Percentage of people in the profession who have a four-year college degree or better

Education Levels	Job Description
	Diagnose, treat, and help prevent diseases and injuries that commonly occur in the general population.
	Diagnose and treat diseases, injuries, and malformations of teeth and gums and related oral structures. May treat diseases of nerve, pulp, and other dental tissues affecting vitality of teeth.
	Investigate and describe the determinants and distribution of disease, disability, and other health outcomes and develop the means for prevention and control.
	Assess and treat persons with hearing and related disorders. May fit hearing aids and provide auditory training. May perform research related to hearing problems.
	Assess and treat persons with speech, language, voice, and fluency disorders. May select alternative communication systems and teach their use. May perform research related to speech and language problems.
	Assess, plan, organize, and participate in rehabilitative programs that improve mobility, relieve pain, increase strength, and decrease or prevent deformity among patients suffering from disease or injury.
	Plan, direct, or coordinate medicine and health services in hospitals, clinics, managed care organizations, public health agencies, or similar organizations.
	Provide healthcare services typically performed by a physician, under the supervision of a physician. Conduct complete physicals, provide treatment, and counsel patients. May, in some cases, prescribe medication. Must graduate from an accredited educational program for physician assistants.
	Plan and conduct food service or nutritional programs to assist in the promotion of health and control of disease. May supervise activities of a department providing quantity food services, counsel individuals, or conduct nutritional research.
	Assist patients with disabling conditions of limbs and spine or with partial or total absence of limbs by fitting and preparing orthopedic braces or prostheses.
	Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients.
	Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.
	Provide radiation therapy to patients as prescribed by a radiologist according to established practices and standards.
	Take x-rays and CAT scans or administer nonradioactive materials to patient's bloodstream for diagnostic purposes. Includes technologists who specialize in other modalities, such as computed tomography and magnetic resonance.
	Produce ultrasonic recordings of internal organs for use by physicians.
	Prepare, administer, and measure radioactive isotopes in therapeutic, diagnostic, and tracer studies utilizing a variety of radioisotope equipment. Prepare stock solutions of radioactive materials and calculate doses to be administered by radiologists.
	Compile, process, and maintain medical records of hospital and clinic patients in a manner consistent with medical, administrative, ethical, legal, and regulatory requirements of the health care system.
	Massage customers for health or restorative purposes.
	Provide specific, well defined respiratory care procedures under the direction of respiratory therapists and physicians.
	Care for ill, injured, convalescent, or disabled persons in hospitals, nursing homes, clinics, private homes, group homes, and similar institutions. May work under the supervision of a registered nurse. Licensing required.
	Design, measure, fit, and adapt lenses and frames for client according to written optical prescription or specification. Assist client with selecting frames. Measure customer for size of eyeglasses and coordinate frames with facial and eye measurements and optical prescription.
	Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications.
	Assist dietitians in the provision of food service and nutritional programs. Under the supervision of dietitians, may plan and produce meals based on established guidelines, teach principles of food and nutrition, or counsel individuals.
	Care for mentally impaired or emotionally disturbed individuals, following physician instructions and hospital procedures. Monitor patients' physical and emotional well-being and report to medical staff.
	Provide basic patient care under direction of nursing staff. Perform duties such as feeding, bathing, dressing, grooming, or moving patients, or changing linens.



HERE ARE the programs of study available within the Health Science cluster in Texas high schools.* The State has created descriptions of each of these programs of study. These documents detail high school classes you might take, extended learning opportunities, and postsecondary programs.

BIOTECHNOLOGY RESEARCH DEVELOPMENT

Scientists in this field perform bioscience research and development connected with the delivery of health care. These professionals may study human diseases to discover new treatments or develop medical devices to directly assist patients.

DIAGNOSTIC SERVICES

Employees in Diagnostic Services use tests and evaluations to aid in the detection, diagnosis, and treatment of diseases and injuries.

HEALTH INFORMATICS

Professionals in this area include administrators who manage healthcare agencies as well as employees in those agencies who manage patient data, financial information, and computer applications related to healthcare management.

SUPPORT SERVICES

Employees in this field perform all the services that provide a therapeutic environment for patient care, including biomedical engineering, hospital maintenance, dietary services, and others.

THERAPEUTIC SERVICES

Professionals in Therapeutic Services work directly with patients; they may provide care, treatment, counseling, and health education information.

* Not all schools offer all programs of study or clusters. Ask your counselor which programs are available at your school.

Listen to your



EXPLORE HEALTH SCIENCE options in high school to choose the career that fits you best.

As a high school junior, Gwendolyn Coleman-Shepherd plans for success as a doctor, but she is starting her career early. Her high school studies have already qualified her to be a nursing assistant (CNA), so she can work as a health professional in the summer and in college, long before she gets her medical degree.

"I think it will help me be a better doctor," says Coleman-Shepherd, who attends Nimitz Senior High School in Houston. "In order to really understand what I'm doing, I have to understand what my team members do also."

High School Courses

Career and technical education (CTE) courses like the ones enrolled in by Coleman-Shepherd give students a head start, whether they're jumping right into the workplace after graduation or going on to college or medical school, says Renee Tonquest, curriculum specialist at the University of North Texas in Denton.

Many students use the certifications they earn in high

school to work in health care while in college. "They are working in positions in their field of study," Tonquest explains.

"This experience will also help students get accepted to college," says Tonquest, "and, once they are in college, their high school experiences will provide the foundation for not only their college coursework but their future career."

Programs of Study

High schools introduce students to the healthcare field through a coherent sequence of courses. Introduction to Health Science Technology "shows students the different careers they can enter," says Gladys Doyno, health science department chair at Weslaco High School.

"In Health Science I, students learn the knowledge and skills necessary for clinical rotations," Doyno says.

Students apply these skills in Health Science II, during which they spend a few hours each week at medical facilities. They acquire hands-on experience in such areas as respiratory therapy, the

THE TEXAS CHILDREN'S CANCER CENTER IN HOUSTON TREATS MORE THAN 26,000 PATIENTS A YEAR.

laboratory, the emergency room, and the nursery. "They have the opportunity to interact with professionals and patients," says Doyno.

Many high schools offer related science courses such as anatomy and physiology and pathophysiology/medical microbiology, which can fulfill the fourth-year science graduation requirement. "Students should choose these on a case-by-case basis, depending on their career goals and what is offered at their schools," says Tonquest.

Academic Courses

Even with all of the choices in health science courses, rigorous academic courses still provide the foundation for students' careers. "Math and science are going to be the most important classes to take," says Tonquest. "English is also important for good communication skills."

Tonquest recommends advanced placement (AP) math and science classes. "Students planning to attend college in a health science field will take

numerous math and science courses. If they have a strong foundation in high school, it will be easier to comprehend the rigorous college course work," Tonquest says.

Certifications and Licenses

One of the exciting aspects of studying health science in high school is that students can earn certifications or licenses even before they graduate. "Any student who wants to pursue a career in health care should pursue a certification in high school," says Tonquest. "He or she will have something to fall back on while furthering his or her education, or if that student chooses not to go to college immediately, he or she can use it right out of high school."

More than 10 certifications and licensures are available in health science, including nurse aide, emergency medical technician, certified coding associate, pharmacy technician, phlebotomy technician, and dental assistant. High school CTE courses provide the clinical experience required and the knowledge to pass the certification or licensing exam.

College Credit

Students in health science have many opportunities to earn college credit while still in high school.

"With agreements with local community colleges and the AP program, we have a lot of students that qualify as juniors in college by the time they graduate from high school," says Barbara Heater, principal at the South Texas High School for Health Professions in Mercedes (see "Med High" at left).

SPOTLIGHT

MED HIGH South Texas High School for Health Professions

When she's at the doctor's office or pharmacy, Barbara Heater takes comfort in knowing that the staff is well trained. That's because as the principal at the South Texas High School for Health Professions, she helped educate them.

"I always run into our graduates," says Heater. "It's comforting because any time you're in for medical treatment it's frightening, and here's someone you know

and they're very well trained."

The magnet school, known locally as "Med High," has been ranked 91st by Newsweek on its Top 1,200 High Schools list. Located in Mercedes, the school was started in 1984 to help address the shortage of healthcare professionals in the Rio Grande Valley.

More than 95 percent of Med High students go on to college, often to prepare for careers in health care. Students are given the opportunity to earn certifications to enter health science careers right out of high school, says Heater, "if students need to work while going to college, they can work in more than an entry-level, minimum-wage position."

Academic rigor is stressed at Med High, says Heater, with many advanced placement classes offered. Solid academic skills are especially important in medicine, she adds.

"We don't want the students to settle for average. Do you want a doctor taking care of you who's only right 70 percent of the time?" she asks. "We hope by giving them a rigorous academic background, it prepares them for what they're going to face in medical school, nursing school, pharmacy school, or whatever career they choose."



Perfect Your Skills

Get experience in
HEALTH SCIENCE
through extended
learning.



Kerry Into wants to be a doctor. With the experiences the 17-year-old received while attending Harlingen High School, she knows she can handle all aspects of the profession.

As part of her health science courses, Into worked in a family medical practice. She remembers the day she held the hand of a patient who was having a medical procedure. "It amazed me that I was able to watch the whole thing without squirming," says Into. "It let me know that I can accept challenging situations."

It's fairly common for a student to think they want to work in health science "up until the time they see their first blood taking," says Mickey Donnelly, director of employee development at the University of Texas M.D. Anderson Cancer Center in Houston.

"Not everyone can deal with some of the things we see daily," he says.

"Find a way to get exposure to what

takes place in a healthcare environment" before starting a job or spending time and money on college courses, recommends Donnelly.

Educational Experiences

Donnelly is talking about extended learning—educational experiences that occur outside the classroom.

In addition to helping students decide if this career is for them, extended learning gives students an advantage when they apply for college.

"There are many people who are book smart but they can't apply their knowledge. Because students have had these experiences in high school, it's a demonstration they can do both," says Barbara Heater, principal at the South Texas High School for Health Professions in Mercedes (see "Med High" on page 13).

Students get exposure through clinical rotations set up by their schools, as Into did. Other opportunities for extended learning include career and technical student organizations

(CTSOs), job shadowing, internships, part-time work, volunteering, and travel programs.

Career Organizations

The CTSO recommended for students interested in health science is Health Occupations Students of America (HOSA). "Through HOSA, students are exposed to volunteer work such as blood drives and raising money to combat diseases," says Gladys Doyno, health science department chair at Weslaco High School. Students can demonstrate their knowledge and skills in regional, state, and national competitions (see "Hands on Health" on page 15).

On the Job

Getting experience through job shadowing is another option for extended learning. A student follows a professional in the workplace for one day to see firsthand what the professional's job is like. Many healthcare professionals participate in National Groundhog Job Shadowing Day, which is observed on



IN TEXAS, 6,877 PHYSICIANS SPECIALIZE IN
INTERNAL MEDICINE,
THE MOST POPULAR SPECIALTY AMONG
THE STATE'S MEDICAL DOCTORS.



February 2 by schools across the country.

During an internship, a student gets more in-depth experience by working for an employer in a mentoring-type relationship. Some internships offer pay in addition to the educational experience.

Unpaid volunteer work is also plentiful in health science, says Heater. "Start out as a volunteer and do a quality job—be on time, be dependable, ask questions, take initiative," she says. Sometimes the experience can result in a part-time or full-time job.

Donnelly suggests that students contact the volunteer services department at a local hospital. "Most have very active volunteer organizations," he says. "M.D. Anderson has about 3,000 to 4,000 volunteers at any given time."

Travel Experiences

Another opportunity to volunteer is through medical service trips sponsored by churches, universities, and nonprofit

organizations. These trips provide medical care for people in impoverished places around the world.

Summer programs are yet another way to get experience outside the classroom. The 10-day National Youth Leadership Forum on Medicine (NYLF) is recommended for most of the programs of study in health science.

"These opportunities give students more of a worldwide view," says Heater. Students learn about a broad range of health topics in the NYLF and are introduced to professionals and faculty from some of the nation's top medical centers and schools. They also take part in a simulation that challenges them to make recommendations for a public health issue.

SPOTLIGHT

HANDS ON HEALTH Students in HOSA and BPA Practice Health Career Skills

The emergency medical helicopter flew in and landed. High school students gathered around while the flight's medical crew demonstrated how a patient is placed on the stretcher and put in the helicopter. The crew explained their jobs and the required training.

This was not an ordinary experience for a high school student. Members of Health Occupations Students of America (HOSA), however, have such experiences all the time, says Patricia Brown, state advisor for HOSA's Texas Association. "There are

a lot of things offered to students that they wouldn't have the opportunity to participate in if they weren't involved in HOSA."

HOSA is an organization for students interested in health careers. Leadership opportunities are available at fall and spring conferences, as well as a state leadership conference every year.

Students can demonstrate their medical skills in more than 40 competitive events, says Brown. "It allows students to show off what they've learned in the classroom and in HOSA," she says.

Because delivery of medical care is a business, many health science students also take part in competitive events organized by Business Professionals of America (BPA). Students compete in traditional business categories such as computerized accounting and human resource management, but also display healthcare business skills in events such as medical office procedures, medical terminology, and medical transcription.



CREATE a Career PORTFOLIO

One valuable tool that can help you get ready for college and beyond is a career portfolio—a collection of items that document your achievements both in and out of school, assembled in one convenient package.

A career portfolio is not simply a resume, although it can certainly include one. So what should go in a career portfolio? A variety of things, depending on your own personal experiences. It could include transcripts and grades; writing samples; letters of recommendation from teachers, mentors, or employers; awards you've received; and items that document other activities, such as internships and job shadowing experiences.

"You need to be specific—dates, how many years, any awards, what they meant, and who you received them from," says Grace Brauchle, who helps students put their portfolios together as the career center coordinator for Lehman High School in Kyle.

Brauchle says portfolios come in handy when students apply for jobs or admission to college. "First impressions are a very big thing," she says, "and you want to be the one whose papers get passed around the office. You want to be the one where the admissions counselors say, 'Wow, look at this one!'"



Images

of
Your

Future

POSTSECONDARY STUDY makes your health science career a reality.

Like many people in health science careers, Hillary McLeod is building her postsecondary education one piece at a time. The 22-year-old started by attending the one-year licensed vocational

nursing (LVN) program at Hill College's Cleburne campus.

She worked with premature babies as part of her clinical studies. That's when she realized she wanted to be a pediatric nurse. "When they said you needed to be a registered nurse [RN] to work in the neonatal intensive care unit, I knew that's what I wanted."

Today, McLeod works part-time as a substitute school nurse while she earns the two-year associate's degree that will prepare her to take the RN licensing exam. Online classes from Excelsior College in New York help her balance school and work. After graduation, her goal is to get her bachelor of science in nursing (BSN) degree. "I want to get that further education so I have more career opportunities."

are looking for," says Mickey Donnelly, director of employee development at the University of Texas M.D. Anderson Cancer Center in Houston.

Donnelly says the list of high-demand degrees at M.D. Anderson includes medical technology, lab technology, radiation technology, respiratory technology, dosimetry, cytotechnology, and nursing degrees, both bachelor's and master's.

To help meet the demand, M.D. Anderson and many other medical centers offer tuition assistance to employees. "We hire employees, then help them with college," says Donnelly.

Changing a Life in One Year

Great jobs in health science exist at all levels of education after high school, from a few months of school to earn a certificate to 16 years of school and training for some specialist doctors. "There's something for everyone," says Brenda Jackson, an RN and the associate dean for the undergraduate program in the School of Nursing at the University of Texas Health Science Center in San Antonio.

Many technical and community colleges across Texas offer certificate programs that require one year or less of training. More than 10 health science certificates are offered in Texas, including medical assistant, dental assistant, emergency medical technician, and pharmacy technician certificates.

Earning an industry certification right out of high school can "drastically" increase students' income, says Kimberly Head-Davis, RN and director of the vocational nursing program at Texas State Technical College in West Texas. "It can change students' lives in one year," she says. "We have students come into

IN 2016, THERE WERE
APPROXIMATELY 63,000
LICENSED PHYSICIANS
IN TEXAS.

Degrees in Demand

Building a career piece by piece is just one approach to success in health science. Before students begin their career training, it is wise for them to find out what degrees are in high demand in health science.

"Specific degrees are really what we

IN 2012,
**11,700 LICENSED
 DENTAL HYGIENISTS**
 WERE ACTIVELY PRACTICING IN TEXAS.

our LVN program making minimum wage. When they graduate, they can earn over \$15 an hour."

College Degrees

Some careers require a two-year associate's degree. Even for the careers that don't, "if students want to move into supervisory positions, they need to earn the higher degrees," says Barbara Bennett, division director of health programs at Texas State Technical College at Harlingen.

Two-year associate's degrees offered by technical and community colleges in Texas include medical transcription, surgical technology, and registered nursing.

Other careers, such as clinical laboratory science and healthcare administration, require a minimum of a bachelor's degree from a four-year university.

Registered nurses enter the profession with either an associate's degree or a bachelor's degree. "At the bachelor's level," says Jackson, "students are prepared to do not only hospital based nursing but more independent nursing," including community health and home health care.

Beyond a Bachelor's Degree

Some specialist occupations, such as cytotechnologist and histotechnologist, require one year of special instruction after receiving a bachelor's degree. Other careers, including certified nurse-midwife and physician assistant, require a master's degree, which usually takes two additional years after a bachelor's degree.

Higher-level study toward a Ph.D. or first professional degree is required for chiropractors, dentists, psychologists, and optometrists.

Physicians, either medical doctors (MDs) or doctors of osteopathy (DOs), require the most postsecondary education — between 11 and 16 years. At the bachelor's level, most students major in either biological sciences or public health, says Raul Caetano, MD, dean of the Allied Health Program for the University of Texas Southwestern Medical Center at Dallas.

Medical school takes four years, followed by a residency in which the student trains in a hospital or clinic. "The

residency time varies across different specialties," says Caetano. "In general, the residency programs take three to five years."

Top-Rated Programs

Texas has some of the top-rated health science programs in the nation. U.S. News & World Report ranks both the University of Texas at Austin Ph.D. pharmacy program and the U.S. Army Graduate Program in Anesthesia Nursing (based at Fort Sam Houston in San Antonio) among the top 20 programs in the nation.

The University of Texas Southwestern Medical Center at Dallas and Baylor School of Medicine are ranked in the top 20 among medical schools in both the research and primary care categories.

Before students make long-range plans to attend a health science program, they should investigate the requirements for each program. "Many programs are very competitive," says Caetano.

For example, Caetano says, the physician assistant program at UT Southwestern Medical Center at Dallas receives about 400 applications each year for 35 to 40 openings.

The trick to getting into these competitive programs? High standardized test scores, a high GPA, and "a strong background in the advanced sciences and math," says Caetano.

"Students have to stay focused once they start high school," he says. "Take rigorous classes."



Get the CREDIT You Deserve

Dual credit in Texas is a great way to earn college credits toward a postsecondary degree while you're still in high school. Dual credit programs center on "articulation agreements," contracts between the student, his or her high school, and postsecondary institutions the student would like to attend. While most students take basic core courses such as English, history, math, science, and social science, coursework may include areas in Career and Technical Education.

Dual credit courses cover the same material as the equivalent college course, allowing the student to receive credit toward the college degree. It's like a bank account. The credit is banked for you at the college, and you withdraw it when you enroll.

Ask your counselor about advanced placement, dual credit, or articulated courses and other opportunities to earn college credit.



ACCEPTED!

SIX THINGS Texas students should know about getting into college

Applying to college is a lot like looking for a job or trying out for a team. You choose something that interests you, and then try your best to convince whoever is in charge that you have what it takes to be part of their organization. But whereas there might be only a few spots open on your high school's varsity football squad, there are thousands of places available in hundreds of colleges each year. Whether you are the first in your family to apply to college or both of your parents have advanced degrees, going through the admissions process can be stressful. Fortunately, there are plenty of free resources available for Texas college-bound students. The best is College for All Texans (www.collegeforalltexas.com), which features a list of all the state's colleges and universities, a checklist for selecting a school, and a link to the online Texas Common Application. To help you get started on your own college search process, here are six steps you should take.

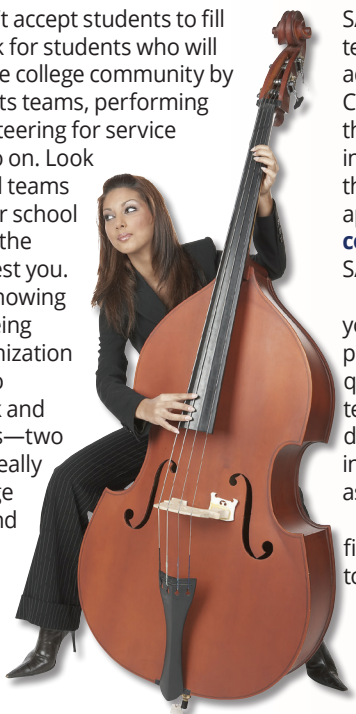
1. Make School Your Job

The first thing college admissions officers look for on your application is your grade point average. It's simple—you have to make the grades in high school to earn your spot in a college. The easiest way to do that is to think of school as your job, starting in your first year. If you show up late for work, slack off, and talk back to the manager, you'll get fired faster than you can say, "Do you want fries with that?" But if you always arrive on time, work really hard, and try to learn from management, then pretty soon you'll probably get a raise or a promotion.

What works on the job works in the classroom, too. Take challenging courses. Turn in all your work on time. Pay attention in class. Contribute to discussions. Ask for help when you don't understand something. By treating school as a career, you'll have a better shot at earning the grades and teacher recommendations that you need to move to the next level.

2. Get Involved in Activities

Colleges don't accept students to fill seats. They look for students who will add to the entire college community by playing on sports teams, performing on stage, volunteering for service projects, and so on. Look at the clubs and teams available at your school and sign up for the ones that interest you. In addition to showing school spirit, being part of an organization is a great way to build teamwork and leadership skills—two traits that can really help your college application stand out from the pack.



3. Build a Resume Portfolio

What if you had to take a final exam on the last three years of a subject and didn't have any notes to study? Well, that's exactly what it's like trying to complete a college application if you haven't kept an ongoing file of all your activities, honors, and employment.

Start your first year and build a career portfolio (see page 15). It's also smart to create a computer file called "college resume" and add to it each time you participate in a service project, win an award, get a new job, and so on. Use technology to create a resume format or ask your parents or guidance counselor for help. When you sit down to complete your college applications, review your career portfolio and call up the resume—all the information you need will be right at your fingertips.

4. Prep for Tests

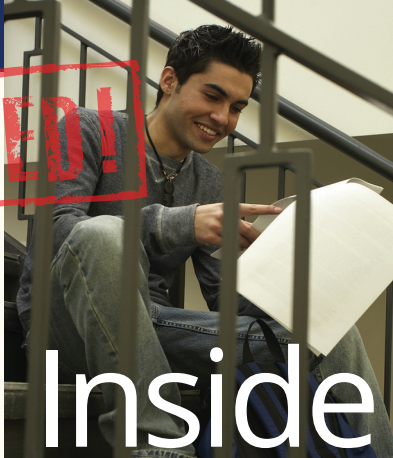
Most colleges use scores from the SAT, SAT II, or ACT tests in making their admissions decisions. Check which tests the schools you're interested in require and sign up to take them in time to include the scores in your application. College for All Texans (www.collegeforalltexas.com) also has a free ACT, SAT, and GRE prep course.

Spend time preparing for the tests before you walk into the room with your No. 2 pencils and calculator. Go through sample SAT questions at www.collegeboard.org or ACT tests at www.actstudent.org. There are also dozens of test-prep books you can buy, some including software that tracks your progress as you go through sample exams.

Remember: If you don't do well on a test the first time, you usually can take it again and try to improve your score.



Inside College Admissions



5. Make a List of Colleges

Do you want to stay in Texas for college or see another part of the country? Would you be more comfortable at a big university or a small college?

Think about what you would like to study and what matters most to you (like location, size, or religious affiliation), and then start developing a list of colleges that fit your criteria.

Use online tools like www.collegeforalltexas.com or www.collegeboard.com to learn more about each school and take online campus tours. Buy or borrow from the library some of the many college guides available. If possible, schedule visits to the schools you are interested in, or, through the school's admissions office, arrange an interview with a recent grad who lives in your area so you can ask questions about courses, faculty, or anything else.

By the fall of your senior year, narrow the list down to the top five or six choices. While some online applications are free, it can cost up to \$70 per school to apply, so be realistic about how much you can spend on applications.

6. Submit Polished Applications

Once you send in an application to a college there's no taking it back, so make sure you get it right the first time. Double-check your spelling. If you use the same essay for multiple schools, remember to change the name of the school to fit each application. Make sure you have any required standardized test results (ACT, SAT, SAT II) sent to each school.

Be neat and complete, and meet every deadline. Make copies of each application before you hit the send button or pop it in the mail. If you don't receive an email or postcard confirming that your application was received, contact the college to make sure it arrived. Items can get lost or misdirected, especially when thousands of students are sending in applications at the same time. By having copies, you can easily submit again.

EVEN IF you get accepted to college, you'll never be able to pay the bill, right? Wrong! There's financial aid available if you know where to look.

College isn't cheap. With tuition and room and board at private schools often topping \$40,000, and even in-state, public schools costing several thousand dollars a year, you may wonder why you should even apply.

Well, don't worry. Every Texas student can afford to go to college.

"Access and affordability of higher education can be intimidating to students and parents; however, there are numerous resources available to walk you through the process and into an exciting future," says Heather V. Crowson, vice president for enrollment management at Sam Houston State University.

The secret to getting the aid you need to go to school is in filling out the necessary forms, getting good grades, and applying to schools that offer generous financial aid packages. (A financial aid package consists of need- or merit-based scholarships and grants plus work-study jobs and low-interest student loans.)

Here's a quick overview of steps you can take to get the financial aid you need to continue your studies after high school. For more information about the aid available at a specific college or university, go to the school's website and click on the "Admissions and Financial Aid" link. Many schools provide an online form you and your parents can fill out that will give you the estimated financial aid package you might receive if accepted to that school.

Apply: You definitely won't get any financial aid if you don't apply. To figure out how much grant money (which you don't pay back) and loans (which you do pay back) you'll need to afford school, colleges use a formula that factors in your parents' income and investments, your income, the number of kids in the family who will be in college at the same time, and other financial information. Families of all income levels may receive aid, so fill out the forms.

All schools require the Free Application



Financial Aid BASICS



for Federal Student Aid (FAFSA), which determines eligibility for federal aid, such as work-study, Pell grants, and the Stafford loan program; and for college grants and, sometimes, merit scholarships. Complete the application as soon as possible at the beginning of October your junior year. FAFSA forms and instruction booklets are available in your guidance counselor's office, or you can complete the form online at www.fafsa.ed.gov.

Most private schools also require applicants to complete a school financial aid application and, in some cases, the CSS/Financial Aid Profile form (<https://student.collegeboard.org/css-financial-aid-profile>) which is used to award nonfederal student aid funds. Carefully read each college's application to determine financial aid deadlines and what forms you will need to submit.

Study In-state: Whether you choose a public or a private school, staying in-state for college will cut your costs considerably. Plus, since Texas covers 267,339 square miles, you can "go away" to college without ever leaving the state.

To help ensure that qualified Texas high school graduates with financial need can go to college, the State Legislature established the TEXAS (Towards Excellence, Access, and Success) Grant Program. Grants can be used to study at any public college or university in the state and are equal to the student's tuition and required fees. In 2012-2013, approximately 33,100 students received TEXAS Grants. To apply, fill out the FAFSA.

Another way to score some serious state aid is to get good grades in high school. Texas students who are in the top 10 percent of their graduating class are eligible for automatic admission to any public university in the state. With that automatic admission comes the opportunity to apply for merit scholarships and special programs available at each school.

Take Two at a Community College: The first two years of many college programs are filled with core courses that could easily be taken at a local community college for a lot less money. If you fill out all the forms, do the math, and still can't afford a four-year school, enroll in a community college for the first two years, then transfer to a four-year school.

By living at home, working part-time, and getting required courses out of the way, you could save tens of thousands of dollars in tuition and room and board, and be able to afford to attend the college of your choice for junior and senior years. For a complete list of the state's community colleges, go to the Texas Association of Community Colleges website at www.tacc.org.

Target Your Search: Applying to a couple of colleges where your grades and talents put you near the top of the typical talent pool makes it more likely you'll qualify for merit aid and other special school scholarships and grants. Do a little research on college websites to find schools where your standardized test scores and grade point average rank you in the top 25 percent or so of the most recently accepted first-year class. Colleges want to attract the best and brightest students available, and often will offer attractive scholarship/grant/loan packages to convince those students to come to their school.

There are also more than 1 million local, national, and college-specific scholarships available each year. The trick is to find and apply for scholarships that best fit your strengths and talents. FastWeb (www.fastweb.com) is a free college scholarship search source. Register online and you will start receiving email notices about scholarships, internships, and other opportunities that fit the profile information you submit.



LOOK IT UP! Here are key words and phrases used in this guide that you may not already know.



what does that mean?

Articulation agreements: formal agreements between or among educational organizations (high schools, community colleges, and universities) that align courses and majors in a way that allows students to transition from one institution to another without loss of course credit or time.

Associate's degree: a two-year degree awarded by a community or technical college.

Bachelor's degree: a four-year degree awarded by a university.

Career and technical student organizations (CTSOs): curricular organizations for students that offer activities and competitions related to particular careers.

Career cluster: a way of organizing curricula, instruction, and assessment around specific occupational groups (for example, Information Technology or Health Science) that offers students core academics, coursework related to specific occupations, and extended learning experiences.

Master's degree: a degree awarded by universities for study beyond a bachelor's degree.

Career guidance: structured developmental experiences presented systematically from kindergarten through 12th grade that help students analyze and evaluate abilities, skills, and interests.

Career portfolio: a collection of student work indicating progress made in subjects, activities, or programs. In career cluster systems, portfolios are often used to assess student performance in extended learning experiences.

Doctoral degree: a degree awarded by universities for study beyond a master's degree. Also referred to as a Ph.D. or professional degree.

Dual credit: credit given in both high school and college for college-level courses taken while in high school.

Extended learning experiences: participation in career and technical student organizations, extracurricular activities, job shadowing, internships, or service learning.

Financial aid: scholarships, grants, loans, and work-study funds awarded to students to pay for college expenses.

Internship: an extended learning experience in which students work temporarily at entry-level jobs in careers that interest them.

Job shadowing: an extended learning experience in which students observe professionals in particular careers as they go through a day on the job.

Postsecondary education: education beyond high school. Middle school and high school are referred to as secondary education, so postsecondary means after high school.

Program of study: a way of organizing the curricula and educational activities within a career cluster related to a student's specific academic and career goal.

Service learning: an extended learning experience in which students do volunteer work related to their career goals.

Targeted industry clusters: six industry clusters that have been identified by Texas as high-demand, high-growth sectors paying high wages. As they are developed by the State, these may be hot areas in which to build a rewarding career.

Program of Study: an education plan suggesting the high school courses a student should take to prepare successfully for graduation and transition into postsecondary education. The vision for Texas CTE is that eighth graders, in consultation with their parents/guardians, counselors, and teachers, will select a program of study and create a plan. Plans are to be reviewed and revised at least once each school year.





Online Info

Explore these Internet resources for more about your education and career options.

America's Career InfoNet www.acinet.org/acinet

This is the place to search for occupational information, industry information, and state-specific labor market information.

College for All Texans www.collegeforalltexans.com

Here is everything a Texan needs to know about preparing for, applying for, and paying for college or technical school. And it's all in one up-to-date, easy-to-navigate mega-site almost as big as the state itself. Remember: \$4 billion is available every year to help Texans attend college.

Employability Skills Framework <http://cte.ed.gov/employabilityskills/>

Employability skills are general skills that are necessary for success in the labor market at all employment levels in all sectors. The Employability Skills Framework is a one-stop resource for information and tools to inform the instruction and assessment of employability skills.

My Next Move www.mynextmove.org/

This is a career planning resource for students, parents, career changers, and career advisors.

TEXAS CAREER CHECK

The State of Texas has created a special website for students and others researching careers. It's called Texas Career Check. Texas Career Check lets you explore higher education options by looking at detailed information by school and program of study, AND you can explore careers, occupational information, and postsecondary education options. You'll find a wealth of information about hundreds of career choices. To explore Texas Career Check, go to www.texascareercheck.com.

O*NET (Occupational Information Network) online.onetcenter.org

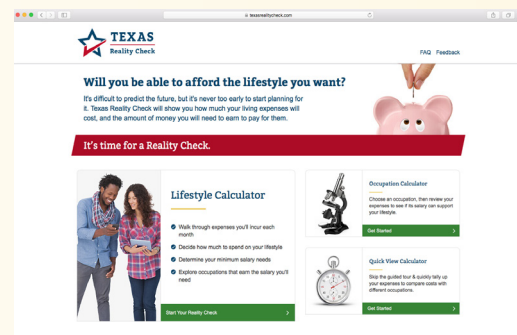
Also available in schools and libraries, O*NET provides full information on occupations, including compensation, employment prospects, and skill matching for students. Information on compensation is available on a state-by-state basis.

U.S. Department of Labor Occupational Outlook Handbook www.bls.gov/home.htm

This nationally recognized resource offers information on job responsibilities, earnings, working conditions, and job prospects for the future.

Take a Reality Check

The Texas Workforce Commission has created an online resource called Reality Check to help you understand how much money you'll need to live on your own after high school or college and how you can earn it. There are three ways to explore careers, expenses, and earnings. For the first option, which is called "Get a Reality Check," you choose an area you'd like to live in, such as Austin. You then go through a series of screens with real-world costs for items such as housing, clothing, transportation, health care, and personal expenses. The site automatically adds up your estimated monthly expenses, then uses salary information for Texas to show you careers that will make you that much money. The second option, called "Future Salary," starts with the wages you expect to earn, what education you plan to pursue, and the career cluster that interests you. Then it generates a list of careers in which you can make that amount of money. The third option, "Occupation Direct," begins with your occupational choice and the area where you want to live, then shows how your estimated expenses subtract from the salary for your chosen job. The site, which is at www.careerwise.mnscu.edu/careers/realitycheck.html, is a great way to play "what if" when it comes to mixing your job, earnings, and expense options.



The results of Reality Check show you how expenses add up quickly when you are living on your own.

Texas CTE Career Clusters



**Agriculture,
Food &
Natural
Resources**

Processing, production, distribution, and development of agricultural commodities and natural resources



**Architecture &
Construction**

Designing, managing, building, and maintaining the built environment



**Arts, A/V
Technology &
Communications**

Creating, exhibiting, performing, and publishing multimedia content



**Business
Management &
Administration**

Organizing, directing, and evaluating functions essential to productive business operations



**Education &
Training**

Providing education and training services, and related learning support services



Finance

Financial and investment planning, banking, insurance, and business financial management



**Government
& Public
Administration**

Executing governmental functions at the local, state, and federal levels



Health Science

Providing diagnostic and therapeutic services, health informatics, support services, and biotechnology research



**Hospitality
& Tourism**

Managing restaurants and other food services, lodging, attractions, recreation events, and travel-related services



**Human
Services**

Providing for families and serving human needs



**Information
Technology**

Designing, supporting, and managing hardware, software, multimedia, and systems integration



**Law,
Public Safety,
Corrections
& Security**

Providing legal, public safety, protective, and homeland security services



Manufacturing

Processing materials into intermediate or final products



Marketing

Performing marketing activities to reach organizational objectives



**Science,
Technology,
Engineering &
Mathematics**

Performing scientific research and professional and technical services



**Transportation,
Distribution
& Logistics**

Managing movement of people, materials, and goods by road, pipeline, air, rail, and water

About Texas CTE You may have seen the name Texas CTE on the cover of this magazine. What exactly is that?

Texas CTE is the name of Texas' college and career education initiative. The idea behind it is simple: Planning for the future so that students achieve lifelong success. As Texas CTE grows, you'll see how subjects such as English, math, science, and social studies are relevant to your personal goals and ambitions. You'll get the chance to begin a plan that gets you where you want to go in life. You'll have the opportunity to take courses and engage in extended learning experiences that give you marketable skills. Best of all, you'll be in control of your future. Read all 16 editions of Texas CTE in Action (available through your counselor) to explore Texas' career clusters and start on the road to success.