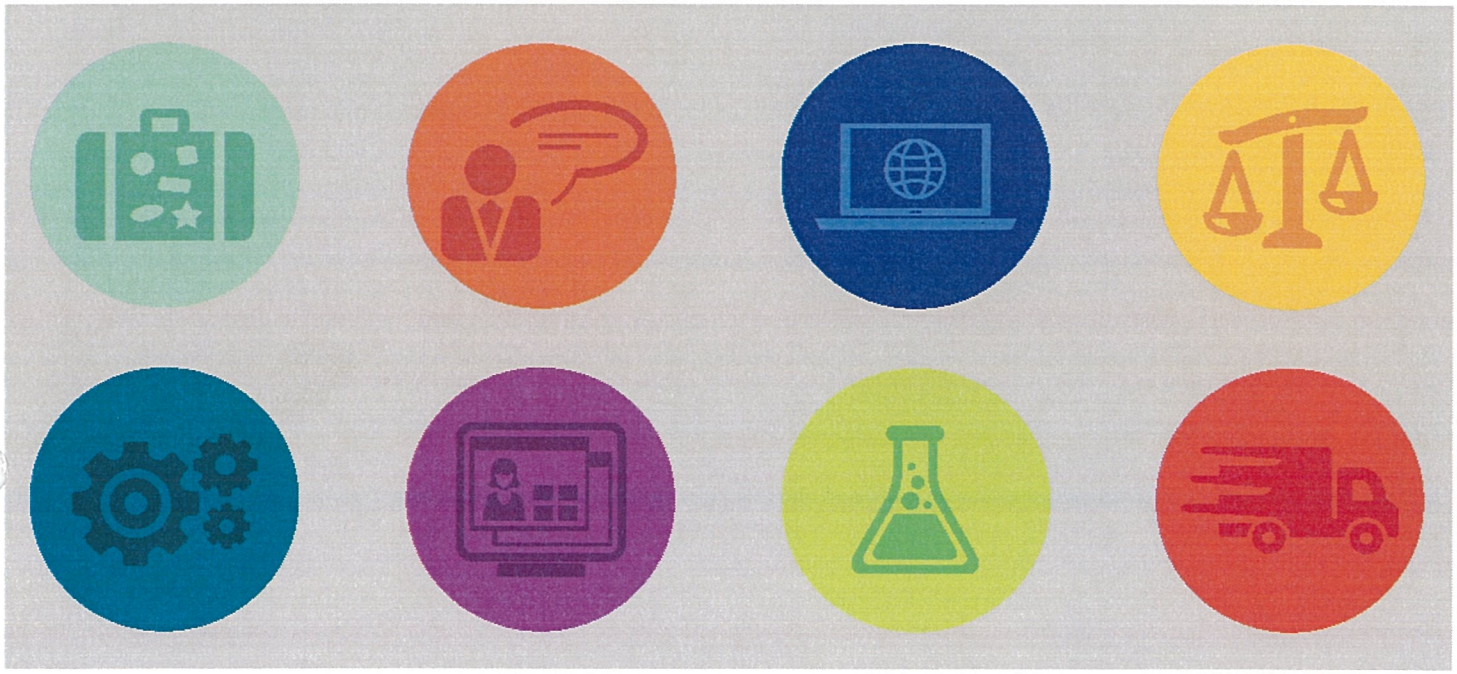
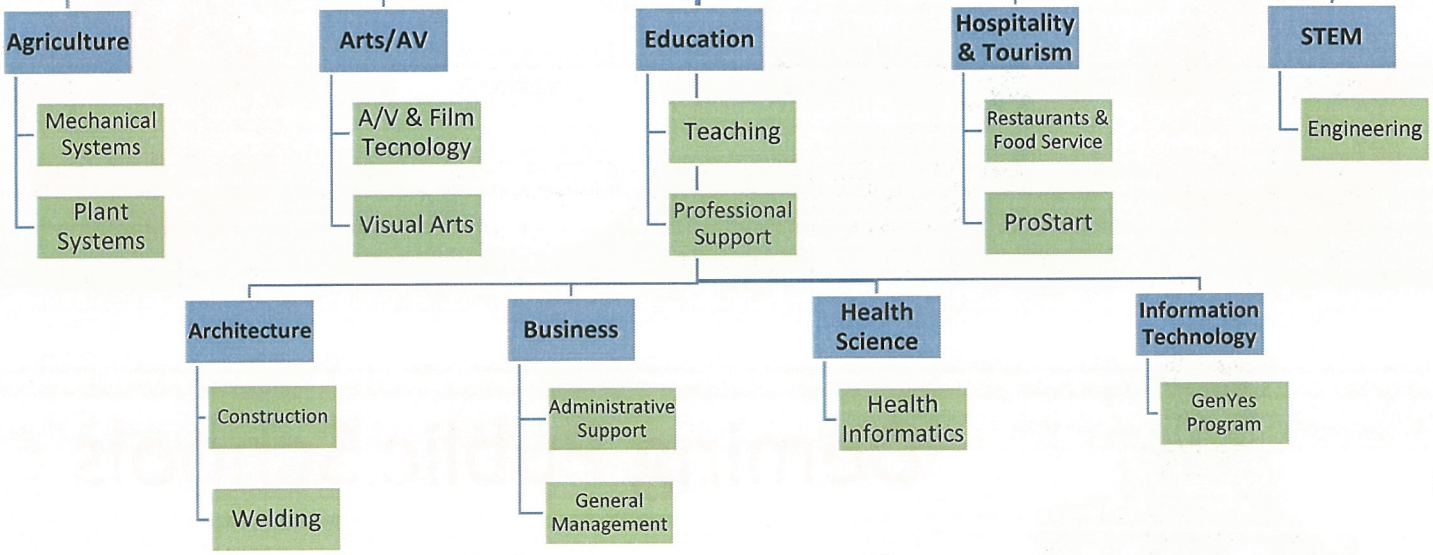
Deming Public Schools

Career Clusters Guide



DHS Career Tech Education



Agriculture, Food & Natural Resources

Think about life without agriculture, food and natural resources. What would we eat? Who would create and maintain the parks that help us relax and enjoy nature? Where would we get help for sick pets? This industry has a huge impact on our daily lives, and — like other industries — technology has brought about changes in the way it operates.

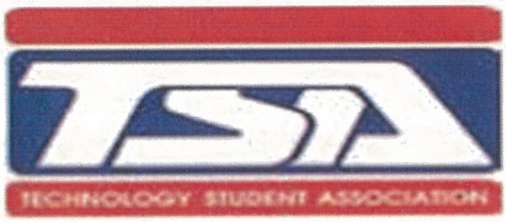
Large farms increasingly use precision-agriculture sensing technology, such as drones, to monitor soil conditions; GPS systems to help steer machinery more precisely; and computer-based maps to prescribe amounts of fertilizer, seed, and chemicals for specific areas. Bioscientists have developed genetically modified organisms (GMOs) that increase crop yield and resistance to pests and disease.

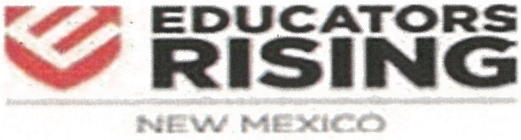
Organic farming, which seeks to avoid chemicals, continues to show economic growth. While responsible for only a little more than 4 percent of total U.S. food sales, sales of organic foods are more than two-and-a-half times greater now than they were 10 years ago.[1]

The Agriculture, Food and Natural Resources cluster contains occupations that require all levels of training. Landscaping and groundskeeping workers and nonfarm animal caretaker positions are among the fastest-growing occupations that require the least training in this cluster. Jobs that usually require associate and bachelor's degrees such as veterinary technologists and technicians, environmental engineers, and cartographers and photogrammetrists are also projected to increase. Employers who often hire workers in this cluster include farmers; federal, state and local governments; pest control businesses; and landscaping companies.

[1] "Organic Market Overview." USDA Economic Research Service. U.S. Department of Agriculture, 7 Apr. 2014. ers.usda.gov/topics/natural-resources-environment/organic-agriculture/organic-market-overview.aspx

Career Technical Student Organizations





Program of Study Course Sequence

	9th Grade	10th Grade	11th Grade	12th Grade
Power, Structural, and Mechanical Systems Pathway	**0316 Intro to Ag Mechanics**	**0152 Ag Structures and Construction**	**0153 Metal Fabrication for the Ag**	**0154 Ag Power and Machinery**
Plant Systems Pathway	**0133 Intro to the Science of Ag**	**0141 Science of Horticulture/Botany**		
Other Agriculture Electives	**0161 Science of Large Ag Animals**			

Architecture & Construction

New York's recently completed Freedom Tower took 10 years to build. Who designed and constructed it? You're probably not surprised to learn that architects, civil engineers, construction laborers, cement masons, concrete finishers, and structural iron and steel workers participated in its development. You've also likely thought about the elevator installers and repairers who installed 73 elevators, or about the HVAC mechanics and installers, plumbers, and electricians who created a healthy environment inside the tallest building in the Western Hemisphere.

Think a bit more deeply and you'll realize that cost estimators and operations research analysts used their mathematic and analytic skills to help make decisions about the nearly $4 billion spent to construct the building. People in management positions coordinated the work of specialty trade contractors to ensure they provided quality work in a timely manner.

While New Mexico may not build a skyscraper the size of the Freedom Tower any time soon, the state's construction industry is expected to grow and show increases in the occupations mentioned above. These occupations require educational backgrounds that range from high school diplomas to graduate degrees. Workers may find employment with plumbing, heating and air condi tioning contractors landscaping businesses; electrical contractors; federal, state, and local government; and commercial building companies.

Construction Pathway

CAREER RESEARCH

- **The American Institute of Architects**
  aia.org/index.htm
- **Technology Student Association**
  tsaweb.org
- **American Society of Civil Engineers**
  asce.org/student_resources
- **The National Center for Construction Education and Research**
  nccer.org
- **Department of Labor/Employment and Training Administration/Registered Apprenticeship**
  dol.gov/apprenticeship
- **SkillsUSA**
  skillsusa.org
- **Green Jobs**
  thegreenjobbank.com
- **Construction Jobs**
  constructionjobs.com

Find more Architecture & Construction occupations at
onetonline.org/find/career?c=2

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
Construction Pathway	0402 Intro to Construction	0425 Carpentry II	0426 Carpentry III	0498 Construction Trades Internship
Welding Pathway	2414 Welding I	2416 Welding II	2417 Welding III	2496 Welding IV: Precision Metalwork-Independent

Arts, Audio/Video Technology & Communications

Cultural and leisure activities help us balance our work and personal lives. In Arts, Audio/Video Technology and Communications, a great variety of people work to give us movies, paintings, music downloads, books, and museums. Actors, artists, musicians, writers, and archivists obviously make their living in jobs that are part of this cluster. Less evident are the employees who work in the background at occupations like set designers, agents and business managers, audio and video equipment technicians, print binding and finishing workers, and historians.

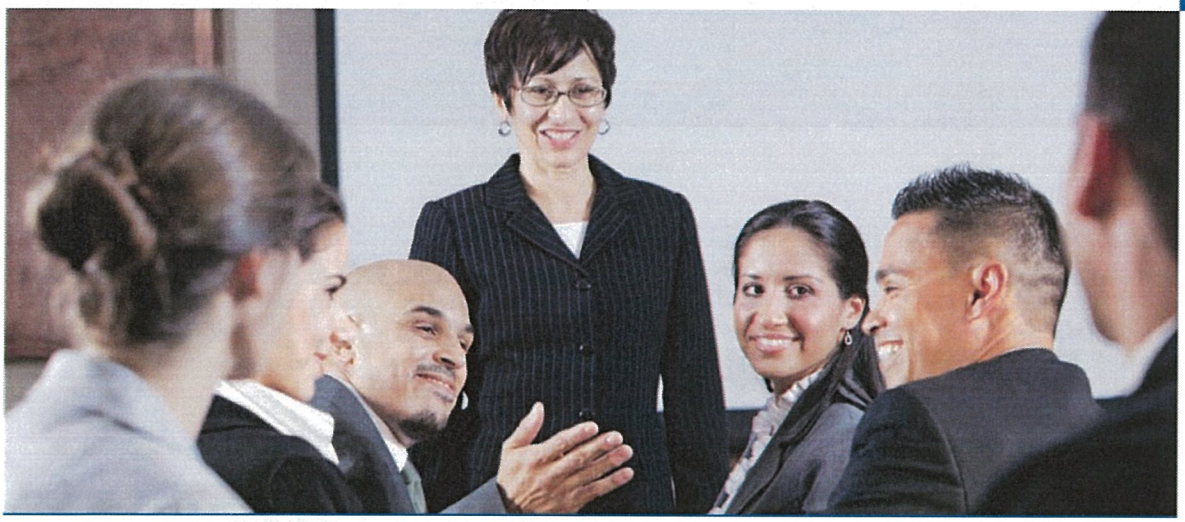
As in many clusters, technology has required workers to learn new skills. Lighting and sound systems are quite different than they were even a decade ago, providing new multi-media options for staging performances and exhibits. Publishers use technologies to create e books that are far different from those used for print versions.

Most occupations in the Arts, Audio/Video Technology and Communications cluster are expected to show average or less growth in the next decade, but several careers do show strong growth. Among them are technical writers, telecommunications line installers and repairers, interior designers, and audio and video equipment technicians. However, in New Mexico, the Film and Television Industry continues to hire local talent for in front of the camera and especially behind the camera technical positions as well as film editing. Approximately two thirds of the careers in this industry require postsecondary education, particularly a bachelor's degree. Industries that often have employment for this cluster's workers include wired telecommunication companies, newspaper publishers print and electronic, commercial printing companies, television stations, and electrical contractors.

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
A/V Technology & Film Pathway	1172 Film/ Videotape	1176 Digital Film Production II	1177 Digital Film Production III	1178 Digital Film Production IV
Visual Arts Pathway	1150 Intro to Art	Select a course in an area of focus from the following subjects: Painting, Drawing, Ceramics	1196 Fine and Performing Art Related Subject	1181 Art Portfolio



Business, Management & Administration

In New Mexico, we are likely to see moderate new job growth in the Business, Management and Administration career cluster in the next decade. Since almost any workplace benefits from strong leadership and organizational support, business and management occupations exist in all industries. Many of us value the peace of mind that comes from knowing that we have other options if we lose our current jobs. More than most clusters, business administration includes careers that move relatively easily from one industry or location to another. Recently, the U.S. Bureau of Labor Statistics listed a dozen careers that offer this kind of flexibility. The list included occupations from business management:

- Customer service representatives
- Secretaries and administrative assistants, except legal, medical, and executive
- General and operations managers
- General office clerks
- Accountants and auditors
- Management analysts
- Financial managers
- Human resources specialists
- Sales managers

Work environments match the functions of specific businesses. While desk jobs with to schedules are typical, business and management workers in industries like transportation and construction may have variable schedules and need to travel to jobsites or work in the outdoors. Educational backgrounds for these jobs range from high school through bachelor's degrees. Places offering employment include but are not limited to corporate and regional management offices federal, state and local governments; temporary service agencies; banks; and public colleges and universities.

Career Technical Student Organization

Program of Study Course Sequence[2]

Administrative Support Pathway	0302 General Computer Applications	0270 Computer/Business Technologies	0303 Business Computer Applications	0224 Business Ownership and Management Entrepreneurship
General Management Pathway	0221 Introductory Business	0223 Business Management	0207 Accounting	0224 Business Ownership and Management Entrepreneurship

Education & Training

Lifelong learning is a phrase we hear often. Finishing high school and other necessary training is the first step toward getting a job, and keeping our jobs often requires that we continue to update our skills. To meet these ongoing training needs, education options have broadened to include online training. Technology like electronic textbooks, notebooks, and smart boards support classroom innovations while also requiring educators to upgrade their technology skills and teaching techniques.

Most occupations in the Education and Training cluster require at least a bachelor's degree, with many postsecondary teaching professionals holding a doctoral or professional degree. Occupations with the most new jobs over the next 10 years are likely to include elementary, preschool, and middle school teachers. College-level health specialties teachers occupy the top position for highest estimated percentage increase in jobs.

Schedules for education workers vary by work setting. Preschool through high school employees work directly with students for approximately eight hours and often devote additional time at home to grading papers and planning lessons. Before- and after-school workers' schedules revolve around times when students aren't in class, and coaches may work directly with students for hours beyond the usual class schedule. Industries that tend to offer many jobs for workers in this cluster include public and private schools, colleges and universities, as well as day care centers

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
Teaching/Training	**0505 Child Development**	**0562 Teacher Academy 1**	**0563 Teacher Academy 2**	**0597 Teaching and Practicum OJT**
Professional Support Pathway	**0505 Child Development**	**2534 Educational Methodology**	**A course should be chosen with a postsecondary institution's aligned POS.**	**2597 Public, Protective, and Social Services-OJT**

Health Science

Where do medical technologies and human touch intersect? They meet within the Health Science career cluster, which is a New Mexico and national growth industry. As the proportion of Americans over age 65 grows and more people survive serious injuries and other health issues, the need for healthcare has increased. If you want to work in a cluster that has good job growth, this cluster may be for you. It is expected to include the greatest number of new jobs in New Mexico over the next 10 years and about one third of the state's hot jobs.

Hospitals or doctors' offices usually come to mind first when we think about healthcare workplaces, but home health care organizations and nursing homes also employ workers in this cluster. Some employees in this industry have 8 to 5 schedules, while others work less traditional shifts.

If you're thinking about a healthcare career, many jobs require good math and science skills. Jobs in this industry include a wide variety of educational backgrounds, ranging from medical degrees to many jobs that require less than four years of college.

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
Health Informatics Pathway	1502 Health Care Occupations	1514 Medical Office	A course should be chosen with a postsecondary institution's aligned POS.	1598 Health Care Sciences Co-Op

Hospitality & Tourism

When you pick up takeout food, eat in a restaurant or cafeteria, and enjoy food at catered events, you're helping support the hospitality industry. If you travel and stay in a hotel, bed-and-breakfast, or RV park, the tourism industry benefits. Going to baseball games, casinos, and museums are other activities that contribute to this industry's part of the economy.

As in most clusters, technology has changed how people work and serve customers. Some restaurants have recently decided to give customers tablets to use for ordering and paying for meals and for playing games while waiting to be served. Computer systems allow managers to track inventory and to set up worker schedules.

Hospitality and tourism occupations include many entry-level positions. Although some management jobs require postsecondary education, a high school diploma is sufficient for a number of occupations. The work environment for these occupations varies according to job function. Kitchen employees work in hot, noisy surroundings while event planners may spend much of their time in an office. Tourism workers often have schedules that depend on their locations and on special events and seasons. Industries that tend to employ the highest number of hospitality and tourism workers include full-service and fast-food restaurants, hotels and motels, janitorial companies, and public schools.

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
Lodging Pathway	0540 Introduction to Hospitality and Tourism	0534 Lodging Management I	0535 Lodging Management II	1606 Work Experience
Restaurants & Food/ Beverage Services Pathway	0504 Nutrition	0508 Culinary Arts	0512 Advanced Foods	0530 Entrepreneurship
CCRB Approved Career Technical Education (CTE) Program of study	0504 Nutrition	0532 ProStart I	0533 ProStart II	0539 ProStart Internship

Information Technology

Maybe you used to shop more at the mall but now order things online. Smart electronics can give directions, and even turn on your oven while you're out. You can push a button to start your car and immediately stop to move the bicycle that showed up in your backup camera. Who's responsible for these tools?

Workers in the information technology (IT) industry develop the software and hardware that make our lives easier, and they fix and help us use these tools. As organizations and individuals face the threats and consequences of data theft, they need information security analysts to maintain online privacy. In New Mexico, this occupation has the highest expected percentage of new job growth in the IT career cluster. Because they occur in almost any industry, three IT occupations are likely to be among those that have the largest number of new jobs in New Mexico: applications software developers, computer user support specialists, and computer systems analysts.

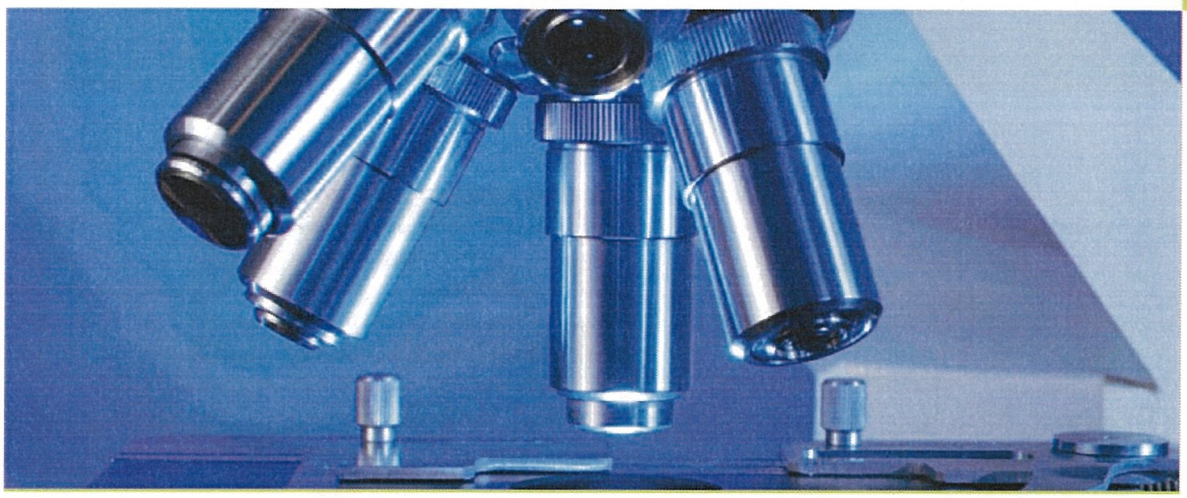
All IT jobs are professional, and most new jobs will require postsecondary education. IT careers can be found in many work settings. The kinds of organizations most likely to employ more IT workers include custom computer programming companies; computer systems design companies; corporate and regional managing offices software publishers and data processing and hosting businesses.

IT has changed the technical skills required in many occupations. While reducing the availability of some jobs, it has also produced totally new career options. As IT continues to evolve, we will need to keep pace with its changes in our workplaces

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
	0316	0320 Computer	0321 Computer	0322: Computer
GenYes Program	Computing Systems	Technology Assistant I	Technology Assistant II	Technology Assistant III



Science, Technology, Engineering & Mathematics

The Science, Technology, Engineering, and Mathematics STEM career cluster includes as many as 184 occupations. What do they have in common? Workers in these careers use scientific, technological, engineering, and or mathematical processes to do research and solve problems. The problems they approach are as different as growing enough food, reducing our reliance on fossil fuels, developing medicines to treat mental illness, and creating computers that enhance our lives. Their career focus can be as small as a nanoparticle or as large as the universe.

Work settings vary with the topic of STEM research. While some jobs take place in front of a computer or in a laboratory, others require people to work in outdoor environments. Schedules also depend on the focus of STEM workers' research. Some individuals have very regular hours, but others' schedules depend upon availability of the subject they analyze. Employers who are likely to hire STEM qualified workers include engineering companies; the federal, state, and local government; scientific research companies; colleges and universities; and medical device manufacturers.

More than any of the other clusters, many STEM careers require at least an Associates degree or higher. Most occupations require a bachelor's degree, and some workers need master's or doctoral level credentials for a significant number of jobs. Typical educational backgrounds for entry into five occupations that are projected to have the most new jobs in New Mexico include:

- Market Research Analysts and Marketing Specialists - Bachelor's degree
- Applications Software Developers - Bachelor's degree
- Computer User Support Specialists – Some college, no degree
- Health Specialties Teachers - Doctoral or professional degree
- Civil Engineers – Bachelor's degree

Career Technical Student Organization

Program of Study Course Sequence[2]

	9th Grade	10th Grade	11th Grade	12th Grade
Engineering, a Project Lead the Way (PLTW) Program	1615 Introduction to Engineering	1617 Principles of Engineering	1619 Civil Engineering and Architecture 1733	1620 Engineering Design and 1735 AP Physics B