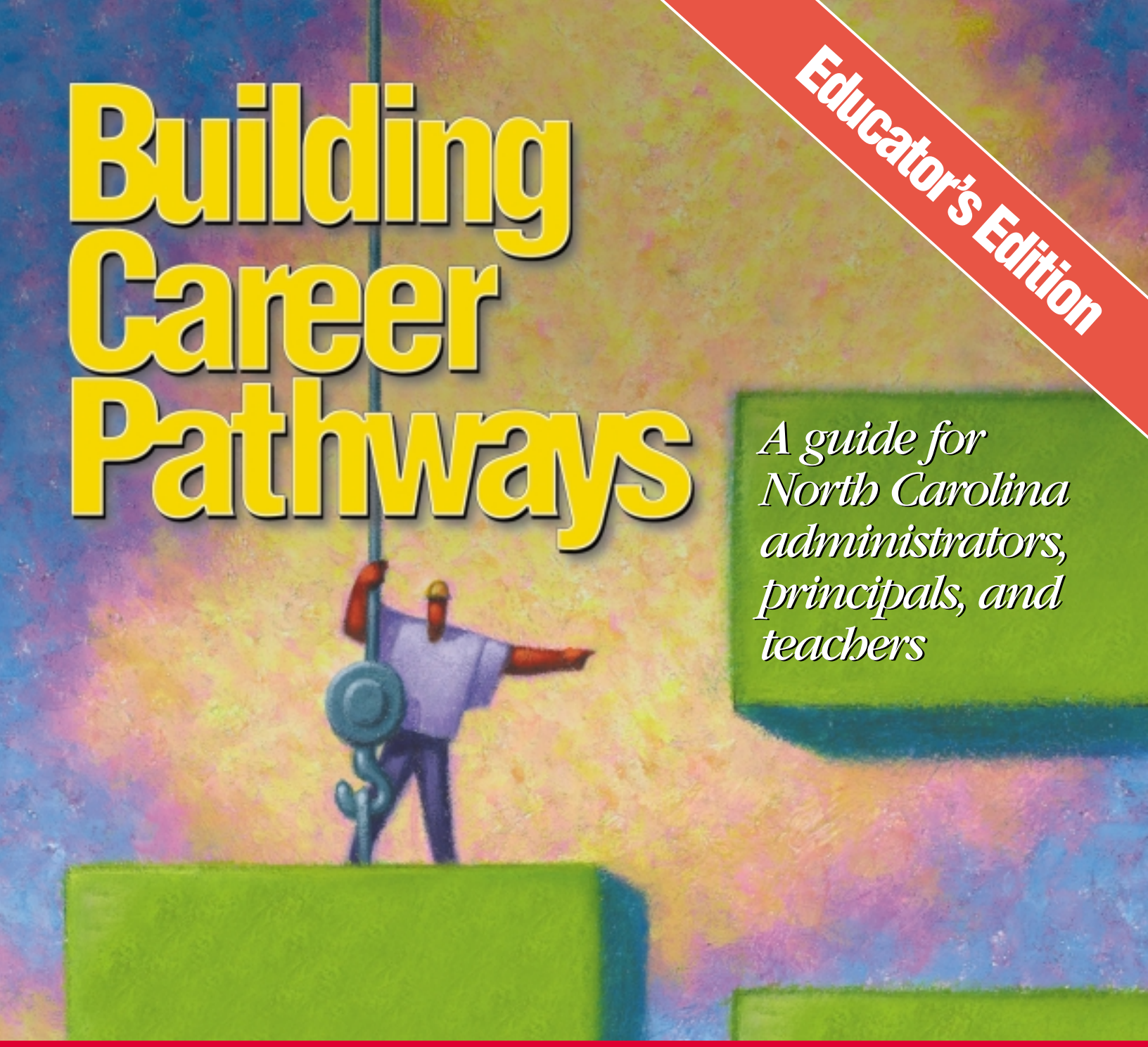
Building Career Pathways

Educator's Edition

A guide for North Carolina administrators, principals, and teachers



How to Connect Education with the World of Work

- *Four steps to building vital career education systems*
- *North Carolina's 10 career pathways*
- *53 career maps for student success*
- *And more…*

Dear Educators,

As North Carolina undergoes the transformation from an economy based on manufacturing and agriculture to a complex service economy in competition with enterprises around the world, the importance of education to our continued prosperity is more important than ever before.

For this reason, we are pleased to present *Building Career Pathways,* a guide for North Carolina educators to implementing our state's innovative career education system. Career pathways offer an approach to education that links what happens in the schools with opportunities in the real-world economy. Rather than simply preparing students for the next grade or for postsecondary education, pathways are designed to carry students through a planned series of educational experiences culminating in rewarding careers and independent adulthood.

These learning experiences combine core academic subjects taught in career contexts with out-of-classroom learning experiences—such as job shadowing, cooperative education, and internships—that engage students directly with the world of work. Preparation continues with postsecondary options such as two-year college, four-year college, the military, or on-the-job training. Student career plans are carefully crafted and frequently updated to guide all these activities and give students control of their economic destinies. By helping students make informed career plans, career pathway systems encourage students to prepare for occupations in which demand is greatest, as well as those that best fit their talents and interests. By making the most of individual talents and capabilities, career pathways not only increase students' chances for personal fulfillment, they help ensure that the North Carolina economy has qualified workers in the sectors that require them. The result is a flexible, competitive economy capable of responding quickly to changing markets.

We urge you to study the four steps for implementing career pathways outlined in *Building Career Pathways* . Examine as well the 53 career maps included for descriptions of actual pathways used in North Carolina. These program options, grouped under the 10 larger North Carolina career pathways, represent a full spectrum of workforce opportunities and the learning experiences needed to prepare students for each pathway. They are an invaluable resource for matching career education with student interests and the needs of the local, national, and world economies.

June S. Atkinson

Michael E. Ward

Howard N. Lee

The information in this guide can help us all as we work together to transform education in North Carolina. By using these resources to build vital career pathway systems, we give our students the skills and knowledge they need to succeed in the global economy.

Very truly yours,

June S. Atkinson, *Director*
Division of Instructional Services
North Carolina Department of Public Instruction

Michael E. Ward, *State Superintendent*
North Carolina Department of Public Instruction

Howard N. Lee, *Chairman*
North Carolina State Board of Education

C O N T E N T S

Section 1: Career Pathway Basics

Section 2: Maps of North Carolina's 10 Career Pathways

All About Career Pathways

Career pathway systems combine rigorous classroom instruction with preparation relevant to students' future careers. By placing education in a career context, career pathways enable schools to target instruction to fit students' needs, motivate them to build their own futures, and help create a workforce that meets the needs of the state, national, and global economy.

Building Career Pathways is a guide for educators explaining how career pathways work and how to put them in place. Included in the guide are more than 50 career maps, which describe particular careers and the ways students can prepare for them. To take the first step toward career pathway transformation, just turn the page and read on.

Traveling Career Pathways to Educational Success

School systems across North Carolina have found a powerful new tool for delivering quality education.

Four Steps to a Career Pathway System

This edition of ***Building Career Pathways*** outlines four steps that are crucial to the successful implementation of career pathway systems. Educators can learn more about each of the four steps on the pages listed below:

The guide also presents 53 career maps (see page 8) marking paths North Carolina students take to succeed in different careers. Educators may choose which maps best suit their students' needs, or use these models to create maps customized to conditions in their school systems.

Education reform, like a diamond, is forever. Ever since teachers first gathered groups of students in their caves to study the phenomenon of fire, committees of other educators, politicians, and interested bystanders have been meeting to find ways to improve education.

For teachers and administrators it can help to consider the reasons for calling the kids into the cave in the first place. It was not to see how quietly and attentively they could sit on their rocks, how few of them would drift off to scratch scenes of the latest hunt on the cave walls, or even how many of the students could manage to light the fire, cook the mammoth steaks, and escape food poisoning.

The real tests of educational success happened outside the cave, much later, when the students were called upon to incorporate the mysteries of fire into solving the larger mysteries of living—how to sustain their existence, nurture their families, and find happiness.

Prepare Students for Living

This is the simple logic of career-oriented education. If the end of education is to help people live their lives, then why not educate them within the context of real living?

Doing so does not mean that schools abandon instruction in core academic subjects—English, science, mathematics, or social studies. It means teaching those subjects within the context of career pathways such as Business Technologies or Health Sciences (see "North Carolina's 10 Career Pathways") and in that way enhancing the lifelong impact of academic instruction.

Committed to Career Pathways

North Carolina has already made a significant commitment to career-oriented education. The high school class of 2004 is the first to have had the option to complete full Career-Technical Education courses of study in either Career Preparation or College Technical Preparation.

Students in these courses of study pick one of 10 career pathways and complete rigorous coursework in a specific career area within the larger pathway. Even students in a College/University Preparation Course of Study are exposed to career instruction; every year two-thirds of North Carolina high school students take at least one Career-Technical Education course.

High schools across the state are combining career coursework with work-based learning experiences such as job shadowing, cooperative education, and internships. School counseling staffs are mobilizing and schools are enlisting teachers to help students make informed decisions about career preparation.

School systems are forming partnerships with local businesses, postsecondary institutions, and public officials to set up pathways that lead seamlessly from high school, through postsecondary education, and on to the world of work.

Schools Fulfill Their Mission

As students find career pathways to succeed in life, schools discover career-technical education pathways that fulfill their reason for being. By linking education and the world of work, particularly the specific opportunities and workforce needs existing in their own communities, high schools are finding a powerful

tool for delivering education that makes a difference both in the lives of their students and of the local economy. By paying attention to the future needs of their students and their communities, and the way the two are inextricably linked, schools become effective catalysts for both personal and social development.

Career pathway programs operating with the input and support of community leaders are much more likely to reflect the needs of the community, and more likely to prepare their students for real jobs meeting those needs.

A Menu of Options

The career maps beginning on page 8 of this guide present the education and employment pathways offered in North Carolina schools. The maps describe the kind of jobs available at the end of each pathway and lay out the preparation students need to qualify for particular jobs.

These maps represent a menu of options for pathway program designers. Their task involves, in part, picking pathway options that match employment opportunities likely to be available when students enter the workforce.

New Opportunities

While nearly 20 percent of North Carolina's workforce is employed in manufacturing today (7 points higher than the national percentage) factory employment in the state has dropped 6 percent in the last quarter century. That trend is expected to continue. More than 85 percent of the manufacturing jobs lost since 1990 have been in the state's traditional industries: tobacco, textiles and apparel, and furniture manufacturing.

Newer kinds of manufacturing such as manufacturing of electrical machinery and industrial equipment have taken up some of the slack.

In Hickory, for example, employment in the metropolitan area's traditional industrial base, furniture manufacturing, shifted in the 1990s to the manufacture of fiber optic cable.

But real growth in the North Carolina economy in the '90s was centered in the service industries, non-manufacturing businesses ranging from biotechnology companies based in the Research Triangle to banking in Charlotte to tourism in Asheville and on the Outer Banks. Service employment jumped 50 percent from 1992 to 1997, driving double-digit population growth in Charlotte, Raleigh-Durham, and Wilmington.

Most of the new service jobs pay as well or better than the jobs lost in manufacturing, but the range of pay varies widely. Not surprisingly, the key to giving students a shot at the best-paying jobs is carefully targeted preparation.

As the economy shifts from one-size-fits-all employment in agriculture and manufacturing to highly specialized, skills-based service jobs, career-oriented education becomes more important than ever.

Act Now

Career pathway systems individualize instruction and guidance to fit students' interests and talents, and they increase schools' abilities to target workforce development to meet the local community's economic needs. They empower students to take control of their futures. They energize education at the grassroots level, involving parents, teachers, counselors, and community leaders as never before in shaping education.

This guide, *Building Career Pathways,* is designed to help school systems find the pathways that best match their students' and communities' needs, and put those systems in place. To connect today's students with tomorrow's jobs and build schools that realize the promise of education reform, North Carolina must act now to set up and perfect career pathway systems across the state.

North Carolina's 10 Career Pathways

North Carolina organizes approaches to career-technical education around the 10 broad career pathways listed below. Preparation for specific careers in each of the career pathways, together with descriptions of the careers and examples of possible occupations in each career, are outlined in the 53 career maps beginning on page 8.

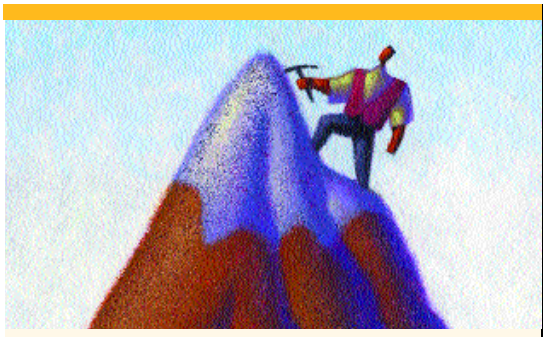
The 10 North Carolina career pathways are

- *Agricultural and Natural Resources Technologies*
- *Biological and Chemical Technologies*
- *Business Technologies*
- *Commercial and Artistic Production Technologies*
- *Construction Technologies*
- *Engineering Technologies*
- *Health Sciences*
- *Industrial Technologies*
- *Public Service Technologies*
- *Transport Systems Technologies*

For maps of careers under each pathway, please turn to the pages indicated by the colors above or check the contents page. Local North Carolina school systems may choose to use fewer career pathways, pathways that are organized differently, or pathways with alternative names.

Exhibit Strong Leadership

Energize career pathway systems with passion, dedication, and effective team-building.



Leadership
A Checklist for Success

- ✔ Meet personally with teachers, parents, and potential partners to enlist support.
- ✔ Listen and respond to the ideas and concerns of partners and team members.
- ✔ Invite business partners to school to view pathways in action and share ideas.
- ✔ Create logos and slogans to help market the career pathway program.
- ✔ Stay on the lookout for new, non-traditional partnership opportunities.
- ✔ Motivate team members by assigning clearly defined responsibilities.
- ✔ Keep the team focused on the program's long-term goals.
- ✔ Share dedication and passion for career education.

Career pathways systems connect classrooms to the world of work. So it only makes sense that the strong leadership skills required to build success in the working world are also needed to create and sustain an effective career education program.

Leaders energize others by sharing their passion for career-technical education. With articulate, skilled leadership teams in place, school systems are able to build community coalitions and get the area's best and brightest to take part.

Lead by Example

Starting any venture from the ground up is a daunting task, but passionate belief in career pathway goals is contagious. Meeting face to face with parents and potential partners is the best way to explain the benefits of career-technical education. Inviting representatives from effective career pathway systems in other districts and states to speak with staff and students can energize the school and help everyone better understand the program's process and goals.

Nurture Leadership in Others

Even the most energetic educator cannot build a successful career pathway system alone. Encourage other faculty members and administrators to share their ideas and take responsibility for parts of the program. Involve students, parents, educators, and business and community leaders in the process so that they can feel a sense of pride and ownership in the system.

An important component of solid leadership is listening. Listen to concerns and suggestions before responding. Incorporate ideas gathered at information sessions into goals and strategies. When people feel heard and valued, they are more willing to commit their support to the effort.

Creativity Counts

Too often, schools rely on the same group of volunteers for every project. Although this core group's support is essential in establishing a pathway system, leaders need to look outside their traditional support bases as well.

Achieving results requires creativity in recruiting and in presentation. For example, some schools and school systems have developed creative slogans, logos, signature colors, and marketing materials to promote their career-technical education programs. Creating a distinctive name and image increases awareness and excitement among students, parents, and faculty; this also makes the project readily memorable to potential supporters.

Build a Winning Team

Leaders on the playing field know how to motivate their team members to achieve a common goal. The same holds true when implementing a career pathway system. Successful systems are built by leaders who have the ability to attract and motivate a team of talented people with a wide variety of skills.

Developing a clear vision and dividing tasks among team members are crucial steps in team building. Establishing concrete goals unites the team in a single mission; delegating responsibilities enables everyone to get actively involved from the beginning.

Focus on Long-Term Goals

Every project encounters setbacks. Effective leaders encourage their teams to learn from mistakes and move on. Keep everyone focused on the team's long-term goals. Remind them that large projects take time to complete. Celebrate small victories such as organizing a career fair or completing a grant application. As long as the team stays committed and focused on long-term goals, success can follow.

Establish a Network of Effective Partnerships

Connect with a broad range of community partners to build lasting career pathway programs.

Connecting curriculum to careers requires reaching beyond the classroom and into the community. By working closely with community partners, career pathway systems can offer students internships, job shadowing, apprenticeships, mentoring, employment, scholarships, and other important opportunities and resources. In return, the community benefits when highly skilled students graduate and enter the workforce.

Identify Potential Partners

Whether a partnership encompasses an entire school system or city or is focused on a single school, the first step is the same: identify potential partners. These can include:

- local business owners
- chamber of commerce officers
- faculty at postsecondary institutions
- service organization members
- trade union representatives
- community leaders
- career and curriculum experts
- employment agency owners
- local government representatives.

Look beyond the school's traditional supporters to reach new potential partners. The broader the network of support, the more resources the program has to draw on.

Show Pathways in Action

The best way to convince busy business owners and other community leaders to partner is to demonstrate how a successful career pathway system will directly improve their bottom lines. Invite potential partners to tour your school and see pathways in action. When potential partners learn firsthand about the programs, they will be more likely to help.

During that initial visit, one useful strategy is to ask for partners' advice, but not for money. Once you establish relationships with partners, asking for financial support will be easy. But as a first step, appeal to them as consultants and show how they can help the school better prepare students for the world of work.

Establish Clear Goals

Once you've recruited potential partners, follow up immediately with a meeting. Don't let that initial enthusiasm wane. Use the first meeting to introduce the school and allow teachers to outline their goals for the year. After the general introductions are made, teachers can ask community partners for specific help. For example, partners could be asked to suggest relevant internship or field trip opportunities, serve as mentors, or donate tools for an upcoming student career competition.

Providing partners with a concrete career pathway to-do list encourages everyone to get involved immediately. Plus, an effective and efficient meeting will accomplish more and increase the chances that partners will stay involved.

Pay Attention to Details

Like any relationship, partnerships require nurturing. Some schools schedule monthly partnership meetings to provide updates, address partners' concerns, and enable teachers to ask for assistance with immediate student needs.

Lead teachers for each career program can facilitate meetings with partners in particular programs, while the principal or another administrator can oversee the entire partnership program either by attending each meeting or reviewing meeting minutes.

Ongoing communication among partners, teachers, and administrators will ensure that any problems are handled immediately and that students receive the greatest benefit from the partnerships.

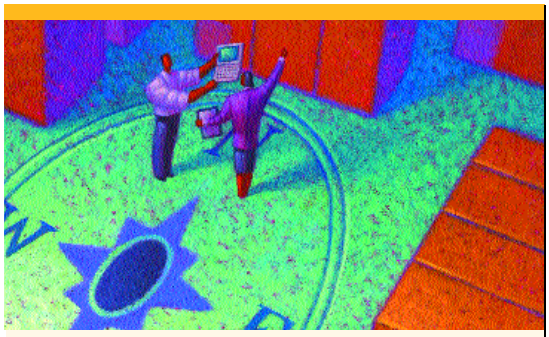
Partnership

A Checklist for Success

- ✔ Research and identify potential community partners.
- ✔ Build broad, diverse partnerships to ensure reliable support and a wide array of resources.
- ✔ Solicit advice and guidance before asking potential partners for money.
- ✔ Tell potential partners how their support will benefit their bottom lines.
- ✔ Present partners with a clear, concrete set of goals.
- ✔ Run meetings with partners efficiently—don't waste partners' time.
- ✔ Nurture relationships with partners by maintaining lines of communication.
- ✔ Deal promptly with any problems that arise in partner relations.

Mobilize Guidance to Support Career Pathways

Reorient guidance systems to help students navigate pathways to career success.



Guidance

A Checklist for Success

- ✔ Make high school career development the culmination of a process that occurs in all grades K–12.
- ✔ Create individual career guidance plans in the eighth grade with students and parents.
- ✔ Have students and parents review plans each year in light of developing student interests and experiences.
- ✔ Involve teachers as adjuncts in the career guidance process.
- ✔ Provide full professional development to help counselors and teachers adapt to career pathway systems.
- ✔ Consider establishing career academies to focus guidance on pathways in smaller "schools-within-the-school."

Graduating from high school into a successful future takes years of exploration and preparation. By learning about various careers and the educational background and training required for each, students can both dream about their futures and take the steps necessary to make those dreams come true.

School counselors and career development coordinators help students navigate their ways through the wide array of educational options to career success. In effective pathway systems, guidance is refocused on career planning, and school counselors enlist teachers to help as career development advisors.

Build on Career Awareness

Effective career pathway systems begin in the early grades. Bringing parents into the classroom to talk about their careers, taking field trips to local businesses and industries, and working through age-appropriate career handbooks are all ways to introduce careers to elementary and middle school students.

In some school systems, career awareness in elementary school is followed by career assessments and career exploration courses in middle or junior high school. New career information, course requirements, and work-based learning opportunities are added each year to prepare students for high school and beyond.

Create Education Plans

By eighth grade, students in effective pathway systems are well equipped to create career-technical education plans with the help of school counselors, career development coordinators, teachers, and their parents. In these plans, which students and parents review each year, students select career pathways and map out studies that will carry them through high school graduation. Career education plans typically include:

- choice of career pathway
- proposed class schedules
- personal, school, and career interests
- internships and other work-based learning
- post-high school plans
- standardized test scores.

Updating plans each year ensures that students can change directions as needed and explore a variety of careers and educational options.

Establish Career Academies

One way to refocus guidance on careers is to restructure the high school as a set of smaller career academies. Freshmen attend a career exploration academy, for example, and then choose a career pathway. The next year, they enter the academy where that pathway is offered.

Each school-within-the-school has its own school counselor and team of teachers who stay with students throughout their three years in the academy. This approach provides greater opportunity for teachers and counselors to work together to give individualized career guidance.

Professional Development

A career-oriented overhaul of guidance systems means teachers, career development coordinators, and school counselors will be assuming new roles. Committing time and resources to professional development for everyone involved makes the transition easier.

Career development workshops, guest speakers, and other programs are available nationwide. In addition, teachers and counselors can visit schools where successful pathway systems are in place and bring good ideas back to their own schools.

Set Up Articulation to Postsecondary Education

Establish agreements with two- and four-year colleges for seamless career education.

Imagine driving down a highway and being forced to exit, detour, and backtrack every time you reached a new city. That's precisely what it is like for many students as they move along their educational pathways from kindergarten through postsecondary education. As students move through the system, courses at each new education level can duplicate material already mastered, and students can waste time and money.

Articulation agreements create the career pathway connections students need and remove the roadblocks they've traditionally faced. These formal arrangements among high schools, two-year colleges, and four-year colleges allow students to move seamlessly from one stage of education to the next toward their ultimate career destinations.

Use the Articulation Agreement

The North Carolina High School to Community College Articulation Agreement, put in place in 1999, has already helped open the road to student success. The agreement, the first of its kind in the nation, set up articulation between high schools and two-year postsecondary institutions in 85 separate courses.

By completing courses or course sequences with the grades specified by the agreement for each program, students may be eligible for credit at any community college offering the program. In addition, further articulation between community colleges and four-year colleges and universities lets North Carolina students move easily to the next level.

Find Articulation Opportunities

In addition to encouraging students to take advantage of the state articulation agreement, educators should be ready to extend articulation to include new academic courses at the high school and community college levels and develop agreements in locally important career pathways. It pays to stay in touch with the various educational options evolving in the local community. Each course, certification, and major available at nearby technical schools and two- and four-year colleges is a potential connection to the future for students.

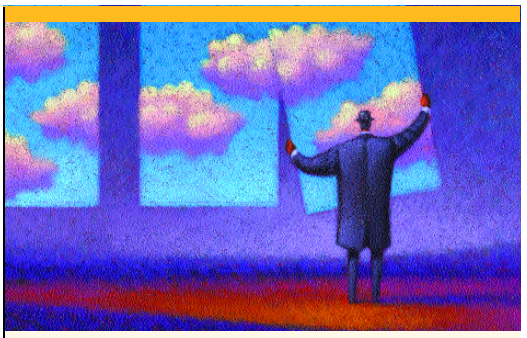
Imagine the Possibilities

When thinking about what articulation agreements could benefit students, be creative. By doing your research, you will be better prepared to negotiate an effective agreement when you sit down to discuss articulation with a potential partner. Established career pathway systems often combine some or all of the options listed below to serve the full range of student needs:

- dual-enrollment opportunities with some courses taken at the high school and others at a local two-year college
- college credit for certain career pathway courses
- acceptance of alternative forms of assessment, such as certificates of skill mastery and career portfolios, in place of academic testing
- shared faculty or faculty interchanges in which college instructors spend time in high school classrooms or vice versa
- systematic articulation of credits, specifying a menu of equivalent courses at different education levels.

Keep Agreements Up to Date

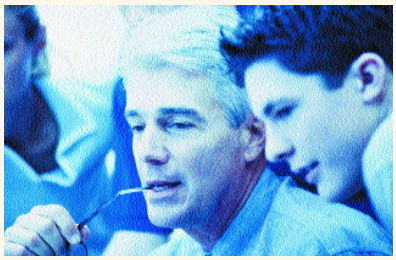
North Carolina is in the process of revisiting its 1999 articulation agreement to keep it current with ever-changing educational and economic environments. Curricula change and new businesses create new opportunities. Articulation agreements must evolve with these changes to remain effective.



Articulation

A Checklist for Success

- ✔ Research opportunities for articulation with community colleges in the North Carolina High School to Community College Articulation Agreement.
- ✔ Respond to local articulation opportunities in new and emerging areas of study.
- ✔ Develop articulation agreements in locally specialized career pathways.
- ✔ Be open to different arrangements to achieve articulation.
- ✔ Partner with other high schools if necessary if local articulation opportunities are limited.
- ✔ Make sure all the needed players are involved in articulation negotiations.
- ✔ Set up standing articulation committees to monitor and revise existing agreements.



Career Map: Agribusiness Systems

Workers in Agribusiness Systems apply scientific knowledge, skills, and methods in activities involving agricultural economics, sales, and marketing, as well as commodity processing, production, and distribution.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective (Business Law recommended)	Elective (Marketing recommended)	Elective
Agriscience Applications	**Agricultural Production I**	**Agricultural Production II**	**Agricultural Advanced Studies**
Digital Communication Systems	**Computer Applications I**	Elective (Business Management and Applications recommended)	**Agricultural Co-op Method/Internship**
Elective	Elective	Elective	**Small Business Entrepreneurship**

Other Courses in Pathway: All agriculture sequenced courses

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• FFA–The Organization for Agricultural Education Students
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Agribusiness Management • General Agriculture	Examples: • Inspection • Quality Assurance	Examples: • Agribusiness Management • Agricultural & Extension Education • Crop Science	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Agricultural Economist*
- *Agricultural Journalist*
- *Agricultural Leader*
- *Agricultural Salesperson*
- *Agriculture Trade Analyst*
- *Banker*
- *Commodity Broker*
- *Educator*
- *Farm Manager*
- *Investment Manager*

Career Map: Agricultural Biotechnology Systems

Workers in Agricultural Biotechnology apply scientific knowledge, skills, and methods in understanding and manipulating the structure of plants and animals to improve people's quality of life and increase food production and quality.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	Elective
Agriscience Applications	**Biotechnology & Agriscience Research I**	**Biotechnology & Agriscience Research II**	**Agricultural Advanced Studies**
Computer Applications I	Elective	**Scientific & Technical Visualization I**	**Agricultural Co-op Method/Internship**
Elective	Elective	Elective	Elective

Other Courses in Pathway: Agricultural Apprenticeship Method; Animal Science I & II; Equine Science I & II; Horticulture I & II

Work-Based Learning Opportunities	Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing • Paid/Unpaid Internship • School-Based Enterprise	• FFA–The Organization for Agricultural Education Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Environmental Science Technology • Horticulture • Agricultural Pest Management	Examples: • Marine Service Technician • Fish & Game Warden • Environmental Analyst • Meteorologist	Examples: • Bioinformatics • Biological Science • Environmental & Molecular Toxicology • Genetics	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Animal Breeder*
- *Biochemist*
- *Chemist*
- *Educator*
- *Engineer*
- *Geneticist*
- *Lab Technician*
- *Molecular Biologist*
- *Researcher*
- *Toxicologist*

Career Map: Animal Systems

Workers in Animal Systems apply scientific knowledge, skills, and methods to improve the breeding, care, and health of animals. Workers deal with swine, beef cattle, horses, fish, sheep, poultry, and some specialty animals.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	**Agricultural Advanced Studies**
Agriscience Applications	**Animal Science I**	**Animal Science II**	**Animal Science II–Small Animal**
Elective	Elective	**Equine Science I**	**Equine Science II**
Elective	Elective	Elective	**Agricultural Co-op Method/Internship**

Other Courses in Pathway: Agricultural Apprenticeship Method, Computer Applications I, Digital Communication Systems, Scientific & Technical Visualization I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• FFA–The Organization for Agricultural Education Students
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Agronomy • Agricultural Technology • Agricultural Productions	Examples: • Animal Trainer • Dairy Technologist • Farmer • Horse Trainer	Examples: • Zoology • Genetics • Biological Services • Animal Science • Poultry Science	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Animal Breeder*
- *Animal Healthcar e Salesperson*
- *Educator*
- *Feed Salesperson*
- *Geneticist*
- *Herdsman*
- *Nutritionist*
- *Pet Shop Operator*
- *Reproductive Physiologist*
- *Veterinarian*
- *Veterinary Assistant*

Career Map: Environmental Service Systems

Environmental Service Systems workers apply scientific knowledge, skills, and methods in the conservation, regulation, or improvement of air, soil, water, land, fish, and wildlife for economic and recreational purposes. Some environmental workers protect and manage forests and maintain, operate, and repair forestry equipment and machinery used in harvesting forest crops.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	Elective
Agriscience Applications	**Environmental & Natural Resources I**	**Environmental & Natural Resources II**	**Agricultural Co-op Method/Internship**
Digital Communication Systems	Elective	Elective	**Agricultural Advanced Studies**
Elective	Elective	Elective	Elective

Other Course in Pathway: Agricultural Apprenticeship Method

Work-Based Learning Opportunities	Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing • Paid/Unpaid Internship • School-Based Enterprise	• FFA–The Organization for Agricultural Education Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Environmental Science Technology • Horticulture • Fish & Wildlife • Urban Pest Management	Examples: • Marine Service Technician • Environmental Analyst • Fish & Game Warden • Meteorologist	Examples: • Entomology • Environmental Science • Natural Resources • Agricultural & Extension Education	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Ecologist*
- *Fire Ranger*
- *Forester*
- *Forestry Soil Conservationist*
- *Health & Safety Sanitation Specialist*
- *Hydrographer*
- *Lumber Yard Manager*
- *Park Ranger*
- *Pollution Control Specialist*
- *Tree Farm Manager*

Career Map: Natural Resource Systems

Workers in Natural Resource Systems apply scientific knowledge, skills, and methods in activities involving the conservation, regulation, or improvement of natural resources for economic and recreational purposes.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	**Agricultural Advanced Studies**
Agriscience Applications	**Environmental & Natural Resources I**	**Environmental & Natural Resources II**	**Agricultural Co-op Method/Internship**
Computer Applications I	Elective	**Horticulture I**	**Horticulture II**
Elective	Elective	Elective	**Scientific & Technical Visualization I**

Other Courses in Pathway: Agricultural Apprenticeship Method, Horticulture II, Landscape Construction, Horticulture II–Turf Grass

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- FFA–The Organization for Agricultural Education Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Environmental Studies • Natural Resource & Wildlife Conservation • Outdoor Parks & Recreation	Examples: • Fish & Game Warden • Environmental Analyst	Examples: • Forestry • Outdoor Parks & Recreation • Natural Resource & Wildlife Conservation	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Environmental Educator*
- *Environmental Engineer*
- *Equipment Operator*
- *Hazardous Waste Specialist*
- *Hydrographer*
- *Park Ranger*
- *Soil Conservationist*
- *Wildlife Protector*
- *Water and Air Quality Specialist*

Career Map: Plant Systems

Workers in Plant Systems apply scientific methods to produce and market plants, shrubs, and trees for ornamental, recreational, and aesthetic purposes. They establish, maintain, and manage horticultural enterprises such as greenhouses, nurseries, and turf and landscaping businesses, as well as manage and cultivate ornamental trees and flowering plants.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	**Agricultural Advanced Studies**
Agriscience Applications	**Horticulture I**	**Horticulture II**	**Horticulture II–Turf Grass**
Elective	Elective	Elective	**Horticulture II–Landscape Construction**
Elective	Elective	Elective	**Agricultural Co-op Method/Internship**

Other Courses in Pathway: Agricultural Apprenticeship Method, Digital Communication Systems, Drafting I, Scientific & Technical Visualization I, Computer Applications I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• FFA–The Organization for Agricultural Education Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Greenhouse/Grounds Maintenance • Landscape Gardening • Turf Grass Management	Examples: • Certified Landscaper • Greenskeeper II • Horticulturist • Tree Trimmer • Floral Designer	Examples: • Horticulture Science • Botany • Microbiology • Agronomy • Crop Science	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Agronomist*
- *Florist*
- *Golf Course Specialist*
- *Greenhouse Manager*
- *Horticulturist*
- *Landscape Architect*
- *Nursery Manager*
- *Plant Breeder*
- *Plant Propagation Manager*
- *Soil Specialist*
- *Turf Manager*

Career Map: Power, Structural, and Technical Systems

Workers in these occupations apply scientific knowledge, skills, and methods in agricultural activities that relate to power, structural, and technical systems. These occupations address power, controls, computer systems, electronics, hydraulics, and pneumatics.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	Speech II
Health/Physical Education	Elective	Elective	Elective
Agriscience Applications	**Agricultural Mechanics I**	**Agricultural Mechanics II**	**Agricultural Mechanics II–Small Engines**
Computer Applications I	**Drafting I**	**Welding Technology I**	**Agricultural Advanced Studies**
Elective	Elective	**Scientific & Technical Visualization I**	**Agricultural Co-op Method/Internship**

Other Courses in Pathway: Agricultural Apprenticeship Method, Career Management

Work-Based Learning Opportunities	Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing • Paid/Unpaid Internship • School-Based Enterprise	• Technology Student Organization (TSA) • FFA–The Organization for Agricultural Education Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • General Agriculture • Biological & Agricultural Engineering	Example: • Not applicable	Examples: • Biological & Agricultural Engineering • Agricultural & Extension Education	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Agricultural Engineer*
- *GPS Technician*
- *Electronics Systems Technician*
- *Information Lab Specialist*
- *Machine Operator*
- *Machinist*
- *Welder*

Career Map: Food Products and Processing Systems

Workers in Food Products and Processing analyze food content and develop ways to process, preserve, package, or store food according to industry and government regulations. They create new food products to meet consumer needs and inspect food processing areas to ensure that sanitation, safety, quality, and waste management standards are met.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry	Algebra II	An advanced math course
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	Elective (Health Team Relations recommended)
Health/Physical Education	Elective	Elective (foreign language recommended)	Elective (foreign language recommended)
Teen Living	**Foods I–Fundamentals**	**Foods II–Advanced**	**Foods II–Food Science**
Digital Communication Systems	**Computer Applications I**	**Biomedical Technology**	**Family & Consumer Sciences Co-op**
Elective	**Biotechnology and Agriscience Research I**	**Life Management**	**Scientific & Technical Visualization I**

Other Courses in Pathway: Career Management, Culinary Arts & Hospitality I, Family & Consumer Sciences Advanced Studies, Family & Consumer Sciences Apprenticeship Method, Fundamentals of Technology, Principles of Technology I, Small Business Entrepreneurship

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Family, Career, and Community Leaders of America (FCCLA)
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Biotechnology • Chemical Technology • Laboratory Technology	Examples: • Baker • Cheese Maker • Cook • Dairy Technologist • Wine Maker	Examples: • Food Science • Biochemistry • Dietetics • Toxicology • Chemistry	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Bacteriologist*
- *Biochemist*
- *Dietician*
- *Food and Drug Inspector*
- *Food and Fiber Engineer*
- *Food Scientist*
- *Meat Cutter-Grader*
- *Meat Processor*
- *Nutritionist*
- *Produce Buyer*
- *Toxicologist*

Career Map: Accounting and Finance

Employees in Accounting and Finance assemble, analyze, process, and communicate essential information about financial operations.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	**Business Law**
Health/Physical Education	Elective	**Work-Based Learning Experience**	**Work-Based Learning Experience**
Principles of Business & Personal Finance	**Computerized Accounting I**	**Computerized Accounting II**	**Small Business Entrepreneurship or Business Advanced Studies**
Digital Communication Systems	**Business & Electronic Communications**	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)
Computer Applications I	**Computer Applications II**	Elective (Economics recommended)	**Business Management & Applications or IB Business Management**

Other Courses in Pathway: Marketing; Computer Programming I & II; Database Programming & Administration; e-Commerce I & II; NAF Academy of Finance I & II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Accounting • Banking &Finance • Business Administration • Insurance	Example: • Purchasing Agent	Examples: • Accounting • Business Administration • Business Management • Finance	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Accountant*
- *Accounting Clerk*
- *Auditor*
- *Bookkeeper*
- *Brokerage Clerk*
- *Controller*
- *Credit Analyst*
- *Debt Counselor*
- *Financial Analyst*
- *Financial Consultant*
- *Investment Advisor*

Career Map: Administrative and Information Support

Administrative and Information Support employees use problem-solving and administrative skills to perform a wide range of activities, including office, project, and human resource management. These employees carry out a wide range of activities to ensure businesses run smoothly.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	A physical science	**Work-Based Learning Experience**
World History	Civics & Economics	U.S. History	Elective (Psychology &Sociology or Psychology &Economics recommended)
Health/Physical Education	Elective	**Work-Based Learning Experience**	Elective
Computer Applications I	**Computer Applications II**	**Business Law**	**Small Business Entrepreneurship or Business Advanced Studies**
Digital Communication Systems	**Computerized Accounting I**	**e-Commerce I or Computerized Accounting II**	**Business Management & Applications**
Principles of Business & Personal Finance	**Business & Electronic Communications**	Foreign Language I	Foreign Language II

Other Courses in Pathway: Marketing, Foundations of Information Technology, Computer Engineering Technology I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Data Entry • Desktop Publishing • Office Systems Technology • Paralegal Technology	Examples: • Keyboard Operator • Legal Secretary • Office Manager-Administrative Services • Program Assistant	Examples: • Administrative Support • Secretarial Science	Examples: • Military Service • On-the-Job Training	Examples: • A+ • MOS • IC3 • Industry Identified

CAREER OPTIONS

- *Administrative Assistant*
- *Customer Service Assistant*
- *Data Entry Specialist*
- *Desktop Publisher*
- *Executive Assistant*
- *Information Assistant*
- *Office Manager*
- *Paralegal*
- *Word Processor*

Career Map: Business Management and Administration

Employees in Business Management and Administration plan, organize, direct, and evaluate functions essential to efficient and productive business operations. People usually enter Business, Management, and Administration careers after completing a postsecondary degree.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	Foreign Language II
Health/Physical Education	Elective	Foreign Language I	**Work-Based Learning Experience**
Principles of Business & Personal Finance	**Marketing**	**Business Mngmnt. & Applications or Marketing Mngmnt. or IB Business Mngmnt.**	**Small Business Entrepreneurship**
Digital Communication Systems	**Business & Electronic Communications**	**Business Law**	**Business Advanced Studies or Marketing Advanced Studies**
Computer Applications I	**Computerized Accounting I or NAF: Finance I**	**Computerized Accounting II or NAF: Finance II**	**e-Commerce I or Marketing Technology & Media**

Other Courses in Pathway: Computer Programming I & II; e-Commerce II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• DECA–An Association of Marketing Students
• Cooperative Education	• School-Based Enterprise	• Future Business Leaders of America (FBLA)
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Administration • Business Management • Human Resource Management • Insurance	Examples: • Office Manager • Purchasing Agent • Program Assistant • Quality Control Inspector	Examples: • Business Administration • Business Management • Logistics Management • Public Administration Management	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Budget Analyst*
- *Business Consultant*
- *Chief Executive*
- *Chief Financial Officer*
- *Financial Manager*
- *Human Resource Manager*
- *Information Systems Manager*
- *Logistics Analyst*
- *Personnel Recruiter*
- *Public Administrator*
- *Product Manager*

Career Map: Entertainment, Event, and Recreation Marketing

Employees in Entertainment, Event, and Recreation Marketing manage, market, and operate entertainment and r ecreation venues or destinations. More than 50 percent of the occupations in the industry are service related. Pay is projected to increase about 35 percent over the next 10 years.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	**Small Business Entrprnrshp. or Mrktng. Management or Mrktng. Adv. Studies**
Health/Physical Education	Elective	**Work-Based Learning Experience**	**Work-Based Learning Experience**
Principles of Business & Personal Finance	**Marketing**	**Sports & Entertainment Marketing I**	**Sports & Entertainment Marketing II**
Digital Communication Systems	**Business & Electronic Communications**	**Travel, Tourism, & Recreation Marketing or NAF: Travel & Tourism I**	**Marketing Technology & Media or e-Commerce I or NAF: Travel & Tourism II**
Computer Applications I	**Computer Applications II**	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)

Other Courses in Pathway: IB Business Management; e-Commerce II; Computerized Accounting I & II; Business Law; Business Management & Applications

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- DECA–An Association of Marketing Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Administration • Business Management • Human Resource Management • Insurance	Examples: • Retail Store Manager • Customer Service Representative • Office Manager • Hotel Associate	Examples: • Sports, Entertainment & Event Management • Parks, Tourism, & Recreation Management • Business Administration	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Arena General Manager*
- *Director of In-Game Entertainment*
- *Box Office Manager*
- *Promotions Manager*
- *Museums/Zoos/Aquariums Manager*
- *Sponsorship Sales Coordinator*

Career Map: Fashion Merchandising

Employees in Fashion Merchandising plan, promote, merchandise, buy, and sell apparel. Employees require skills in communication, human relations, marketing, management, merchandising, pricing, and risk management.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Elective
World History	Civics & Economics	U.S. History	**Marketing Advanced Studies**
Health/Physical Education	Elective	**Work-Based Learning Experience**	**Work-Based Learning Experience**
Principles of Business & Personal Finance	**Business & Electronic Communications**	**Marketing Management or Small Business Entrepreneurship or IB Business Management**	**Marketing Technology & Media or e-Commerce I**
Digital Communication Systems	**Fashion Merchandising**	Elective (Apparel Development I recommended)	Elective (Apparel Development II recommended)
Computer Applications I	**Computer Applications II**	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)

Other Courses in Pathway: e-Commerce II; Computerized Accounting I & II; Business Law; Business Management & Applications

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• DECA–An Association of Marketing Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Administration • Business Management • Marketing &Retailing • Advertising &Graphic Design	Examples: • Clothing Designer • Customer Service Representative • Retail Store Manager • Office Manager	Examples: • Art &Design • Textiles &Apparel • Technology & Management • Textile Chemistry	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Apparel Production Manager*
- *Costume Curator*
- *Fashion Consultant*
- *Fashion Coordinator*
- *Fashion Designer*
- *Fashion Editor*
- *Retail Fashion Buyer*
- *Retail Manager*
- *Visual Merchandiser*
- *Wholesale Fashion Buyer*

Career Map: Hospitality and Tourism

Employees in Hospitality and Tourism careers manage, market, and operate restaurants and other food services, lodging, tourist attractions, and travel-related services. Hospitality and Tourism is one of the largest industries in North Carolina.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Travel, Tourism, & Recreation Marketing
World History	Civics & Economics	U.S. History	
Health/Physical Education	**Sports & Entertainment Marketing I**		**Work-Based Learning Experience**
Marketing	**Business & Electronic Communications**	**Sports & Entertainment Marketing II**	**Small Business Entrepreneurship**
Digital Communication Systems	**Marketing Management or IB Business Management**	Elective (Culinary Arts &Hospitality I recommended–2 credits)	Elective (Culinary Arts &Hospitality II recommended–2 credits)
Computer Applications I	**Computerized Accounting I**	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)

Other Courses in Pathway: e-Commerce I & II; Computerized Accounting II; Business Law; Business Management & Applications

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- DECA–An Association of Marketing Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Management • Human Resource Management • Hotel &Restaurant Management	Examples: • Retail Store Manager • Customer Service Representative • Hotel Associate • Office Manager	Examples: • Business Management • Tourism Management • Marketing • Food &Beverage Management	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Director of Convention and Visitors Bureau*
- *Director of Hotel Operations*
- *Director of Membership Development*
- *Director of Tourism*
- *Events Manager*
- *Food and Beverage Manager*
- *Nature Tourism Coordinator*
- *Tour & Travel Coordinator*

Career Map: Information Technology–Database Development and Administration

Employees in Database Development and Administration develop, create, and administer computer databases used in business and industry.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	**Business & Electronic Communications**	**Work-Based Learning Experience**	**Work-Based Learning Experience**
Foundations of Information Technology	**Principles of Business & Personal Finance**	**e-Commerce I**	**Small Business Entrepreneurship or Business Advanced Studies or e-Commerce II**
Digital Communication Systems	**Computer Programming I or NAF: IT I or IB IT I**	**Computer Programming II or NAF: IT II or IB IT II**	**AP Computer Science**
Computer Applications I	**Computer Applications II**	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)

Other Courses in Pathway: Networking I, Marketing, Network Engineering Technology II, Database Programming & Administration, Computer Engineering Technology I

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Example: • Computer Programming	Examples: • Computer Operator • Computer Peripheral Equipment Operator	Examples: • Management Information Systems • Computer Programming	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Business Continuity Analyst*
- *Data Systems Designer*
- *Data Systems Manager*
- *Database Administrator*
- *Database Analyst*
- *Database Developer*
- *Database Manager*
- *Decision Support Service Provider*
- *Systems Analyst*

Career Map: Information Technology–Network Administration

Employees in Network Administration operate and administer computer networks. Their duties include network development, maintenance, and security.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	**Business Law**
Health/Physical Education	Elective	**Work-Based Learning Experience**	**Work-Based Learning Experience**
Foundations of Information Technology	**Business & Electronic Communications**	**Networking I**	**Network Administration II**
Digital Communication Systems	**Principles of Business & Personal Finance**	**e-Commerce I**	**Small Business Entrepreneurship or Business Advanced Studies or e-Commerce II**
Computer Applications I	**Computer Applications II**	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)

Other Courses in Pathway: Marketing; Network Engineering Technology II; Database Programming & Administration; Computer Programming I & II; Computer Engineering Technology I

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Networking Technology • Information Systems–Network Administration & Support	Examples: • Computer Operator • Computer Peripheral Equipment Operator	Examples: • Management Information Systems • Network Administration	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Communication Analyst*
- *Information Systems Administrator*
- *Information Systems Operator*
- *LAN Manager*
- *Network Administrator*
- *Operations Analyst*
- *Security Analyst*
- *Systems Administrator*

Career Map: Information Technology–Programming-Software Engineering

Employees in Programming-Software Engineering analyze, design, and code business computer software.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	Elective (Foreign Language II recommended)
Health/Physical Education	**Principles of Business & Personal Finance**	Elective (Foreign Language I recommended)	Elective (Work-Based Learning Experience recommended)
Foundations of Information Technology	**Business & Electronic Communications**	**Computer Engineering Technology I or Networking I**	**Computer Engineering Technology II or Network Administration II**
Digital Communication Systems	**Computer Programming I**	**Computer Programming II**	**AP Computer Science**
Computer Applications I	**Computer Applications II**	**e-Commerce I or NAF: IT I or IB IT I**	**e-Commerce II or Small Business Entrprnrshp. or Business Advanced Studies or NAF: IT II or IB IT II**

Other Courses in Pathway: Marketing, Network Engineering Technology II, Database Programming & Administration

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Computer Programming • Information Systems	Example: • Not applicable	Examples: • Computer Programming • Management Information Systems • Business Administration	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Business Analyst*
- *Computer Engineer*
- *Programmer*
- *Programming Analyst*
- *Programming Engineer*
- *Systems Analyst*

Career Map: Information Technology–Web Development and Administration

Employees in Web Development and Administration develop, create, and administer e-business websites.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	**AP Computer Science**
Health/Physical Education	Elective	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)
Computer Applications I	**Computer Applications II**	**e-Commerce I**	**e-Commerce II**
Foundations of Information Technology	**Business & Electronic Communications**	**Computer Programming I or NAF: IT I or IB IT I**	**Computer Programming II or NAF: IT II or IB IT II**
Digital Communication Systems	**Principles of Business & Personal Finance**	**Work-Based Learning Experience**	**Small Business Entrepreneurship or Business Advanced Studies**

Other Courses in Pathway: Marketing, Database Programming & Administration, Computer Engineering Technology I, Networking I, Network Administration II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Electronic Commerce • Internet Technologies	Examples: • Computer Operator • Computer Peripheral Equipment Operator	Examples: • Business Administration–Electronic Commerce • Management Information Systems	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified Certified Professional Webmaster

CAREER OPTIONS

- *e-Commerce Manager*
- *Web Designer*
- *Website Developer*
- *Webmaster*
- *Web Administrator*

Career Map: Marketing Sales and Services

Employees in Marketing Sales and Services plan, manage, and perform marketing activities to reach organizational objectives. Sales and service occupations vary immensely according to the type of business and products involved.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	**Work-Based Learning Experience**
Health/Physical Education	Elective	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)
Principles of Business & Personal Finance	**Marketing**	**Marketing Management or IB Business Management**	**Business Law**
Digital Communication Systems	**Business & Electronic Communications**	**Computerized Accounting I**	**Marketing Advanced Studies**
Computer Applications I	**Computer Applications II**	Elective (Psychology & Sociology recommended)	**Marketing Technology & Media**

Other Courses in Pathway: Commerce I & II; Computerized Accounting II; Business Management & Applications

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- DECA–An Association of Marketing Students

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Administration • Business Management • Human Resource Management • Marketing &Retailing	Examples: • Retail Store Manager • Customer Service Representative • Office Manager • Post Office Clerk	Examples: • Business Management • Business Administration • Advertising • Merchandising • Risk Management	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Advertiser*
- *Customer Satisfaction Manager*
- *International Trader*
- *Manufacturer's Representative*
- *Marketing Associate*
- *Marketing Service Manager*
- *Outside Sales Representative*
- *Retail Marketing Coordinator*
- *Retail Sales Specialist*

Career Map: Small Business Management and Entrepreneurship

Employees in Small Business Management and Entrepreneurship own and manage small and start-up business enterprises. Leaders in this field often are the key decision makers and visionaries in the business world. Small business owners typically assume most of the risks and receive most of the rewards for providing their products and services to customers.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling or Pre-Calculus
Earth & Environmental Science	Biology	Chemistry	**Marketing Technology & Media or Advanced Studies**
World History	Civics & Economics	U.S. History	**Work-Based Learning Experience**
Health/Physical Education	Elective	**Work-Based Learning Experience**	**Business Management & Applications or IB Business Management**
Computer Applications I	**Computer Applications II**	**Strategic Marketing or IB Business Management**	Business Law
Digital Communication Systems	**Computerized Accounting I**	**Computerized Accounting II**	**Small Business Entrepreneurship**
Principles of Business & Personal Finance	**Business & Electronic Communications**	**e-Commerce I**	**e-Commerce II**

Other Courses in Pathway: Computer Programming I & II; Marketing; Sports & Entertainment Marketing I & II; Travel, Tourism, & Recreation Marketing

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• DECA–An Association of Marketing Students • Future Business Leaders of America (FBLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Administration • Hotel &Restaurant Management • Insurance • International Business	Example: • Not applicable	Examples: • Business Administration • Business Management • Hotel &Restaurant Management • International Business	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Business Consultant*
- *Business Owner/Operator*
- *Business Partner*
- *e-Commerce Owner/Manager*
- *Entrepreneur*
- *Franchisee/Independent Distributor*
- *Small Business Owner*

Career Map: Broadcast, Film, and Communication Media

Workers in Broadcast, Film, and Communication use state-of-the-art equipment and processes to design and assemble visual or audio products. Digital media specialists use their knowledge of non-linear editing, digital cameras, digital audio, and multimedia post-production techniques to convey information through both traditional and Web-based mass media.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	An advanced mathematics course
Earth & Environmental Science	Biology	A physical science	Network Engineering Technology II
World History	Civics & Economics	U.S. History	e-Commerce I
Health/Physical Education	Electronics I	Electronics II (2 credits) or Networking I	Elective (Art I recommended)
Introduction to Trade & Industrial Education	**Communication Systems**	**Digital Media I**	**Digital Media II**
Fundamentals of Technology	**Printing Graphics I**	**Printing Graphics II** (2 credits)	**Trade & Industrial Education Adv. Studies**
Drafting I	**Scientific & Technical Visualization I**		Computer Engineering Technology I

Other Courses in Pathway: Digital Communication Systems, Computer Applications I, Trade & Industrial Education Cooperative Training I, Small Business Entrepreneurship, Computer Engineering Technology, Career Management

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- SkillsUSA–The Student Organization for Trade & Industrial Education
- Technology Student Association (TSA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Media Integration Technology • Film & Video Production Technology	Examples: • Program Assistant • Television Director • Light/Sound Technician • Field Engineer • Film or Videotape Editor	Examples: • Mass Communication • Multimedia Arts & Sciences • Radio & TV Broadcasting	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Audio-Video System Service Technician*
- *Broadcast Technician*
- *Cinematographer*
- *Film/Video Editor*
- *Media Integration Specialist*
- *Photojournalist*
- *Web Integration Specialist*
- *Video Systems Technician*
- *Video Graphics Special Effects and Animation Technician*

Career Map: Printing Graphics

Workers in Printing Graphics use computers, printing presses, and other technologies to design, print, finish, and bind publications. Workers in large businesses may work only in specific parts of the process, while in small businesses they may work with the product from design through binding.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	
ITIE or Fundamentals of Technology	**Printing Graphics I**	**Printing Graphics II** (2 credits)	**Scientific & Technical Visualization I**
Computer Applications I	**Career Management**	**Digital Media I**	**T&I Cooperative Training I** (2 credits)
Elective	**Communication Systems**		**Digital Media II**

Other Courses in Pathway: Digital Communication Systems, Drafting I, Trade & Industrial Apprenticeship Method, Digital Media II, Trade & Industrial Advanced Studies, Life Management, Small Business Entrepreneurship

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- SkillsUSA–The Student Organization for Trade & Industrial Education
- Technology Student Association (TSA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Graphic Arts & Imaging Technology • Advertising & Graphic Design	Examples: • Assistant Press Operator • Bookbinder • Lithographic Platemaker • Printer • Scanner Operator	Examples: • General Communications • Graphic Technology • Industrial Technology Education • T&I Education	Examples: • Military Service • On-the-Job Training	Example: • Print Ed–Industry Identified

CAREER OPTIONS

- *Advertising Manager*
- *Bookbinder*
- *Business Owner*
- *Desktop Publisher*
- *Editor*
- *Flexographer*
- *Illustrator*
- *Prepress Technician*
- *Photographer*
- *Printer*
- *Print Manager*
- *Screen Printer*

Career Map: Visual Arts–Housing, Interiors, and Design

Visual artists in Housing, Interiors, and Design create art to communicate ideas, thoughts, or feelings. Interior designers enhance the functional and aesthetic qualities of interior spaces. They analyze clients' needs and goals, present design recommendations, and evaluate design solutions.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	Chemistry	Elective
World History	Civics & Economics	U.S. History	
Health/Physical Education	**Drafting I**	**Life Management**	Elective (Art IV recommended)
Teen Living	**Computer Applications I**	**Housing & Interiors I**	**Housing & Interiors II** (2 credits)
Digital Communication Systems	**Apparel Development I**	**Apparel Development II**	**Small Business Entrepreneurship**
Elective (Art I recommended)	Elective (Art II recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)

Other Courses in Pathway: Career Management, Digital Media I, Family & Consumer Sciences Advanced Studies, Fashion Merchandising, Printing Graphics I, Printing Graphics II, Scientific & Technology Visualization I

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Family, Career, and Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Advertising & Graphic Design • Fine & Creative Woodworking • Interior Design	Examples: • Architectural Drafter • Display Designer • Floral Designer • Interior Designer • Pattern Maker	Examples: • Home Furnishing Merchandising • Interior Design • Architecture & Drafting • Commercial Art	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Art Teacher*
- *Architect*
- *Cabinet Designer*
- *Curator*
- *Draftsperson*
- *Furniture Designer*
- *Interior Designer*
- *Kitchen/Bath Planner*
- *Landscape Designer*
- *Set Designer*
- *Textile Designer*
- *Wall Covering Installer*

Career Map: Visual Arts–Textiles, Apparel, and Fashion

Visual artists in Textiles, Apparel, and Fashion may work in management, design, or production. In a small business, workers may work with a project from design through finished product. Use of computer-assisted design adds personalized touches to production and design work.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	**Life Management**
World History	Civics & Economics	U.S. History	**Family & Consumer Sciences Advanced**
Health/Physical Education	Elective (Business & Electronic Communications recommended)	Elective (Marketing recommended)	Elective (Marketing Management recommended)
Teen Living	**Apparel Development I or Housing & Interiors I**	**Apparel Development II**	**Small Business Entrepreneurship**
Computer Applications I	**Fashion Merchandising**	Elective (foreign language recommended)	Elective (foreign language recommended)
Elective (Art I recommended)	Elective (Art II recommended)	Elective (Art III recommended)	Elective (Art IV recommended)

Other Courses in Pathway: Family & Consumer Sciences Internship/Co-op/Apprenticeship, Career Management, Scientific & Technology Visualization I, Drafting I, Digital Communication Systems, Digital Media I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Family, Career, and Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Fashion Design • Fashion Merchandising • Visual Merchandising • Interior Design & Merchandising	Examples: • Alterations/Tailor, Fabric, & Clothing Designer • Dry Cleaner • Interior Designer • Upholsterer	Examples: • Fashion Merchandising • Retail Management • Textile & Apparel Technology & Management	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Alterations Specialist*
- *Designer*
- *Entrepreneur*
- *Interior Designer*
- *Production Manager*
- *Production Team Member*
- *Retail Manager*
- *Retail Sales Associate*
- *Tailor*
- *Textile/Fabric Designer*
- *Textile Machine Operator*

Career Map: Construction Technology

Construction workers may be employed as carpenters or specialized subcontractors. Carpenters' work may be divided in three general classifications: forming, framing, and finishing. Forming carpenters build forms for buildings, bridges, and r oads. Framing carpenters construct steel- or wood-framed floors, walls, and roofs. Finish carpenters are responsible for installing trim, molding, and stair systems. Specialized subcontractors may install windows, roofing, flooring, drywall, or paint.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	
World History	Civics & Economics	U.S. History	
Health/Physical Education	**Drafting I**		**Trade & Industrial Advanced Studies**
ITIE or Fundamentals of Technology	**Construction Technology I**	**Construction Technology II** (2 credits)	**Construction Technology III** (2 credits)
Career Management	**Structural Systems**	**Electrical Trades I**	**Electrical Trades II** (2 credits)
Elective	**Masonry I**	Elective (Principles of Business & Personal Fin. recommended)	**Small Business Entrepreneurship**

Other Courses in Pathway: Digital Communication Systems, Computer Applications I, Drafting I, Drafting II–Architectural, Principles of Technology I, Trade & Industrial Cooperative Training, Masonry II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Building Construction Technology • Construction Management Technology • Carpentry	Examples: • Carpenter • Cabinetmaker • Construction Driver • Construction Craft Laborer	Examples: • Construction/Building Technology • Construction Engineering • Construction Management	Examples: • Military Service • On-the-Job Training	Example: • National Center Construction Education Research–Carpentry Certification

CAREER OPTIONS

- *Cabinet Installer*
- *Carpenter (Form, Frame, Finish)*
- *Construction Business Owner*
- *Construction Estimator*
- *Drywall Installer*
- *Flooring Contractor*
- *General Contractor*
- *Heavy Equipment Operator*
- *Job Superintendent*
- *Millwright*

Career Map: Drafting–Architectural

Drafting–Architectural workers design buildings and other structures focusing on aesthetics and functionality. They use computer-aided design and drafting software to apply building codes and specifications, as well as concepts and principles of design.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	**Principles of Technology I**	Elective (Principles of Technology II recommended)
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective	Elective (Technical Advanced Studies recommended)	**Trade & Industrial Advanced Studies**
Housing & Interiors I	**Drafting I**	**Drafting II–Architectural**	**Drafting III–Architectural**
ITIE or Fundamentals of Technology	**Construction Technology I**	**Construction Technology II** (2 credits)	**Construction Technology III** (2 credits)
Elective	**Structural Systems**		**Small Business Entrepreneurship**

Other Courses in Pathway: T&I Apprenticeship Method; T&I Internship; Masonry I, II, & III; Electrical Trades I & II; T&I Industrial Co-op Training I; Welding Technology I; Career Management; Furniture & Cabinetmaking I & II; Project Lead The Way (PLTW)

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Architectural Technology • Civil Engineering Technology • Landscape Architecture Technology	Examples: • Drafter • Architectural Drafter • Landscape Drafter • Heating & Ventilation Drafter	Examples: • Construction Management • Landscape Architecture • Civil Engineering	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Architect*
- *Architectural and Civil Drafter*
- *Building Code Official*
- *Civil Engineer*
- *Environmental Designer*
- *Estimator*
- *General Contractor/Builder*
- *Project Inspector*
- *Project Manager*

Career Map: Electrical Trades

Electrical workers install, repair, and maintain electrical systems for commercial, residential, and industrial building and power transmission. Today's market is demanding an increasingly diverse set of technical skills. It is not uncommon for electricians to install and maintain fire/security control systems, network systems, and other infrastructure through which voice, data, and video are transmitted.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry & Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Computer Engineering Technology II
World History	Civics & Economics	U.S. History	
Health/Physical Education	Communication Systems		**Small Business Entrepreneurship**
ITIE or Fundamentals of Technology	**Electrical Trades I**	**Electrical Trades II** (2 credits)	**Drafting I**
Digital Communication Systems	**Networking I**	Computer Engineering Technology I	**Trade & Industrial Cooperative Training I**
Elective	**Computer Applications I**	Electronics I	**Trade & Industrial Education Adv. Studies**

Other Courses in Pathway: Career Management; Drafting II–Architectural; Construction Technology I & II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Electrical Engineering Technology • Construction Management Technology • Internet Technologies	Examples: • Electrician • Electric Motor & Generator Assembler • Line Installer-Repairer • Cable Installer-Repairer	Examples • Construction/Building Technology • Construction Engineering • Trade & Industrial Education	Examples: • Military Service • On-the-Job Training	Examples: • National Center Construction Education Research-Electrical Certification • CompTIA Net+

CAREER OPTIONS

- *Electrician*
- *Electrical Contractor*
- *Electrical Inspector*
- *Elevator Installer/Repairer*
- *Internetworking Technician*
- *Power Plant Technician*
- *Telecommunications Specialist*
- *Equipment Installer*
- *Telecommunications and Network Engineer*

Career Map: Furniture and Cabinetmaking

Furniture and cabinetmakers cut, shape, and assemble articles of wood or engineered wood products for use in homes, businesses, and institutions. Production workers in the architectural millwork and fur niture industry often complete machine operation tasks with CNC or long production-run jobs. Custom furniture and cabinetmakers create, build, and finish individual and short-run pieces of furniture and casework for use in individual homes or small businesses.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Networking I
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Art Design recommended)		**T&I Cooperative Training I** (2 credits)
ITIE or Fundamentals of Technology	**Furniture & Cabinetmaking I**	**Furniture & Cabinetmaking II** (2 credits)	**Trade & Industrial Advanced Studies**
Computer Applications I	**Digital Communication Systems**	**Construction Technology I**	**Drafting I**
Elective	Elective (Programming I recommended)		**Manufacturing Systems**

Other Courses in Pathway: Structural Systems, Trade & Industrial Education Apprenticeship Method, Principles of Technology I

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Fine & Creative Woodworking • Professional Crafts • Furniture Production Technology	Examples: • Furniture Builder • Cabinetmaker • Display Designer • Hand Carver • Furniture Designer	Examples: • Industrial Production Technology • Trade & Industrial Education • WoodScience	Examples: • Military Service • On-the-Job Training	Example: • Woodlinks Certification

CAREER OPTIONS

- *Architectural Millwork Sales Associate*
- *Cabinetmaker*
- *Cabinet and Casework Installer*
- *Custom Furniture Builder*
- *Furniture Designer*
- *Furniture Finisher*
- *Furniture Salesperson*
- *Millworker*
- *Musical Instrument Maker*
- *Stair Builder*

Career Map: Masonry

Masons build walls, floors, partitions, fireplaces, and other structures using a variety of masonry building materials and techniques. Their work varies in complexity, from laying a simple masonry walkway to installing the ornate exterior of a high-rise building.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Principles of Business & Personal Finance
World History	Civics & Economics	U.S. History	
Health/Physical Education	**Drafting I**	**Drafting II–Architectural**	**Trade & Industrial Advanced Studies**
ITIE or Fundamentals of Technology	**Masonry I**	**Masonry II** (2 credits)	**Masonry III** (2 credits)
Computer Applications I	**Structural Systems**		**T&I Cooperative Training I** (2 credits)
Elective	**Career Management**	**Construction Technology I**	**Small Business Entrepreneurship**

Other Courses in Pathway: Computer Applications I, Digital Communication Systems, Drafting III–Architectural, Principles of Technology I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Masonry • Building Construction Technology • Historic Preservation Technology	Examples: • Bricklayer • Stone Mason • Cement Mason • Stonecutter • Tile Setter	Examples • Construction Management • Construction Engineering • Construction/Building Technology	Examples: • Military Service • On-the-Job Training	Example: • National Center Construction Education Research Masonry Certification

CAREER OPTIONS

- *Block Mason*
- *Bricklayer*
- *Cement Mason*
- *Concrete Finisher*
- *Masonry Business Owner*
- *Masonry Contractor*
- *Plasterer*
- *Stonecutter*
- *Stone Mason*
- *Stucco Mason*
- *Tile Setter*

Career Map: Bioengineering/Mathematics

Workers in Bioengineering/Mathematics apply advanced mathematics, life science, and technology to alter natural matter and energy, resulting in processes, facilities, and devices that improve people's lives. Career possibilities include teaching or research and working in the laboratory or in the field.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling English 4
Biology	Anatomy	Chemistry	Environmental Science/AP
World History	Civics & Economics	U.S. History	Elective (Environmental & Ntrl. Resources I recommended)
Health/Physical Education	Elective (Biomedical Technology recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Elective (Animal Science I recommended)	Elective (Animal Science II recommended)	**Scientific & Technical Visualization I**	**Scientific & Technical Visualization II**
Elective (Biotechnology & Agriscience Research I)	Elective (Biotechnology & Agriscience Research II)	**Digital Electronics (PLTW*)**	**Technology Advanced Studies**
Principles of Engineering (PLTW*)	**Introduction to Engineering (PLTW*)**	**Bioengineering (PLTW*)**	**Engineering Design & Development (PLTW*)**

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Other Courses in Pathway: Fundamentals of Technology; Principles of Technology I & II

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Technology Student Association (TSA)
- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Biotechnology • Environmental Science Technology/Water Resources Management • Industrial Pharmaceutical Technology	Examples: • Material Lab & Supply Technician • Quality Technician • Material Analyst	Examples: • Biotechnology Engineering • Biology • Protein Science • Environmental Science • Material Science	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Biomedical Engineer*
- *Biotechnology Engineer*
- *Engineering Researcher*
- *Laboratory Technician*
- *Materials Analyst*
- *Materials Scientist*
- *Numerical Analyst*
- *Quality Control Scientist*
- *Statistician*
- *Scientific Visualization Technician*

Career Map: Civil Engineering and Architecture

Workers in Civil Engineering and Architecture focus on the design of commercial and residential structures. Civil engineers and architects study and apply integrated life support systems, urban design, and environmental science in their work. They apply design and drafting to the construction of residential and commercial buildings.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling English 4
Earth & Environmental Science	Biology	A physical science	Elective (Housing & Interiors I recommended)
Elective (Visual Art I recommended)	Civics & Economics	U.S. History	**Technology Advanced Studies**
Health/Physical Education	Elective (Visual Arts II recommended)	**Scientific & Technical Visualization I**	**Scientific & Technical Visualization II**
Drafting I	**Drafting II–Architectural**	**Drafting III–Architectural**	Elective
Fundamentals of Technology	**Structural Systems**	**Digital Electronics (PLTW*)**	**Communications Systems**
Principles of Engineering (PLTW*)	**Introduction to Engineering (PLTW*)**	**Civil Engineering & Architecture (PLTW*)**	**Engineering Design & Development (PLTW*)**

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Other Courses in Pathway: Electronics I & II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Technology Student Association (TSA)
• Cooperative Education	• School-Based Enterprise	• SkillsUSA–The Student Organization for Trade & Industrial Education
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Architectural Technology • Civil Engineering Technology • Industrial Engineering Technology	Examples: • Quality Technician • Drafter Electronic Technician • Engineering Model Maker • Material Analyst	Examples: • Architectural Engineering • Civil Engineering • System Design Engineering • Project Engineering	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Architecture Engineer*
- *Civil Engineer*
- *Construction Engineer*
- *Design Engineer*
- *Environmental Engineer*
- *Structural Engineer*

Career Map: Computer Engineering Systems

Computer engineering technicians begin their careers with the construction, diagnosis, and repair of various microelectronic devices. As the information technology field continues its exponential growth, it is often a natural step for a computer engineering technician to move beyond the device level and begin to work with network installation andepair. These technicians frequently deal directly with customers and must work well with people.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling English 4
Earth & Environmental Science	Biology	A physical science	Programming I
World History	Civics & Economics	U.S. History	
Health/Physical Education	**Computer Engineering Technology I**	**Computer Engineering Technology II**	**Trade & Industrial Advanced Studies**
ITIE or Fundamentals of Technology	**Computer Applications I**	**Electronics I**	**Electronics II** (2 credits)
Digital Communication Systems	**Principles of Technology I**	**Communication Systems**	**Principles of Technology II**
Elective	**Networking I**	**Network Engineering Technology II**	**Small Business Entrepreneurship**

Other Courses in Pathway: Foundations of Information Technology; Network Engineering Technology III; Drafting I; Scientific & Technical Visualization I & II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Computer Engineering Technology • Electronics Engineering Technology • Internet Technologies	Examples: • Appliance Repairer • Cable Installer • Internetworking Technician • Line Erector	Examples: • Computer Science • Computer Engineering • Information & Computer Technology Program • Industrial Technology	Examples: • Military Service • On-the-Job Training	Example: • Comp TIA A+ Certification

CAREER OPTIONS

- *Computer Scientist*
- *Computer Service Repair Technician*
- *Electronic Appliance Repair Technician*
- *Electronics Technician*
- *Internetworking Associate*
- *IT Security Technician*
- *IT Support Service Technician*

Career Map: Drafting–Engineering

Workers in Drafting–Engineering design machine parts, mechanisms, and mechanical systems. They apply computer-assisted drafting and design as well as industrial and product design concepts and principles in their work. This pathway provides an excellent foundation for a variety of technology, engineering, manufacturing, and mechanical occupations.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English I	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	**Principles of Technology I**	**Principles of Technology II**
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective		**Trade & Industrial Advanced Studies**
ITIE or Fundamentals of Technology	**Drafting I**	**Drafting II–Engineering**	**Drafting III–Engineering**
Computer Applications I	**Electronics I**	**Electronics II** (2 credits)	**T&I Co-operative Training I** (2 credits)
Elective	**Manufacturing Systems**	Elective	Elective

Other Courses in Pathway: T&I Apprenticeship Model, T&I Internship, T&I Cooperative Training II, Transportation Systems, Career Management, Technology Advanced Studies

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Technology Student Association (TSA)
- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Electrical & Electronics Engineering Technology • Industrial Engineering Technology • Machining Technology	Examples: • Die Maker • Drafter • Tool Designer • Electronics Technician • Industrial Designer	Examples: • Electrical Engineering • Electronic Engineering • Industrial/Manufacturing Technology • Industrial Design	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Aerospace Engineer*
- *Aerospace Technician*
- *Automotive Engineer*
- *Drafter*
- *Industrial Engineer*
- *Industrial Technician*
- *Manufacturing Technician*
- *Mechanical Engineer*
- *Prototype Engineer*
- *Project Development Technician*
- *Technical Sales Manager*

Career Map: Electronics

Workers in Electronics design, build, install, test, troubleshoot, repair, and modify developmental and production electronic components, equipment, and systems.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	**Principles of Technology I**	**Principles of Technology II**
World History	Civics & Economics	U. S. History	**Small Business Entrepreneurship**
Health/Physical Education	Elective	Elective	**Manufacturing Systems**
ITIE or Fundamentals of Technology	**Electronics I**	**Electronics II** (2 credits)	**T&I Cooperative Training I** (2 credits)
Computer Applications I	**Communication Systems**	**Computer Engineering Technology I**	**Computer Engineering Technology II**
Elective	**Drafting I**		

Other Courses in Pathway: Digital Communication Systems; Scientific & Technical Visualization I & II; Drafting II & III–Engineering; Networking I; T&I Apprenticeship Method; Technology Advanced Studies; Small Business Entrepreneurship; T&I Advanced Studies; Career Management; T&I Cooperative Training II; Network Engineering II & III

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Electrical Engineering Technology • Electrical Power Production Technology • Electronics Engineering	Examples: • Cable Installer-Repairer • Cable Splicer • Calibration Laboratory Technician • Electronics Technician	Examples: • Electrical Engineering • Electronics Engineering • Communications Engineering • Technology Education	Examples: • Military Service • On-the-Job Training	Example: • Certified Electronics Technician

CAREER OPTIONS

- *Electronics Repairers, Commercial and Industrial Equipment*
- *Computer, Automated Teller, and Office Machine Repairer*
- *Electronics and Electrical Engineers*
- *Home Appliance and Power Tool Repairers*

Career Map: Manufacturing Processes Engineering

Workers in Manufacturing Processes Engineering apply expertise in electronics, material science, thermodynamics, dynamics, and engineering to design processes for the fashioning of materials into intermediate or final products.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	**Principles of Technology I**	**Principles of Technology II**
World History	Civics & Economics	U.S. History	**Technology Advanced Studies**
Health/Physical Education	Elective (Foreign Language I recommended)	Elective (Foreign Language II recommended)	Elective (Foreign Language III recommended)
Drafting I	**Drafting II–Engineering**	**Drafting III–Engineering**	Elective (**Small Business Entrprnrship.** recommended)
Fundamentals of Technology	**Manufacturing Systems**	**Computer Integrated Manufacturing (PLTW*)**	Elective (Principles of Business & Per. Finance recommended)
Principles of Engineering (PLTW*)	**Introduction to Engineering (PLTW*)**	**Digital Electronics (PLTW*)**	**Engineering Design & Development (PLTW*)**

*Project Lead The Way

Other Courses in Pathway: Electronics I & II; Technology Education Apprenticeship

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Industrial Engineering Technology • Manufacturing Engineering Technology	Examples: • Engineering Assistant • Engineering Model Maker • Industrial Engineering Technician • Manufacturing Technician	Examples: • Manufacturing Process Engineering • System Design Engineering • Project Engineering	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Development Engineer*
- *Manufacturing Processes Engineer*
- *Material Engineer*
- *Product Design Engineer*

Career Map: Networking Systems

Workers in Networking Systems have diverse responsibilities. Entry level technicians may be responsible for simple design and installation of local area networks (LANs). More advanced network engineering specialists are responsible for the design and installation of wide area networks (WANs) and metropolitan area networks (MANs). An engineer functioning at this level has mastered security, routing, administration, and other networking tasks.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective (e-Commerce II recommended)
World History	Civics & Economics	U.S. History	Elective (Programming I recommended)
Health/Physical Education	**Principles of Technology I**		Elective (Programming II recommended)
ITIE or Fundamentals of Technology	**Electronics I**	**Electronics II** (2 credits)	**Trade & Industrial Advanced Studies**
Foundations of Information Technology	**Networking I**	**Network Engineering Technology II**	**Network Engineering Technology III**
Elective	**Computer Engineering Technology I**	Elective (e-Commerce I recommended)	**Computer Engineering Technology II**

Other Courses in Pathway: Small Business Entrepreneurship; Career Management; Drafting I; Scientific & Technical Visualization I & II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Computer Engineering Technology • Electronics Engineering Technology • Internet Technologies	Examples: • Equipment Installer • Internetworking Technician • Line Erector • Line Installer-Repairer	Examples: • Computer Science • Computer Engineering • Information &Computer Technology Program • Industrial Technology	Examples: • Military Service • On-the-Job Training	Examples: • CompTIA Net + • Server+ • CCNA

CAREER OPTIONS

- *Cable Installer*
- *Cabling Technician*
- *Internetworking Associate*
- *IT Support Specialist*
- *Line Technician*
- *Network Designer*
- *Network Security Specialist*
- *Systems Administrator*
- *Web Server Administrator*
- *Telecommunications Specialist*

Career Map: Science and Technology

Workers in Science and Technology experiment and apply scientific concepts and principles in the areas of research, technology, communication, manufacturing, transportation, and architecture. Requiring strong math and technical skills, this pathway provides an excellent foundation for occupations in these fields.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	
Health/Physical Education	**Computer Applications I**	**Scientific & Technical Visualization I**	**Scientific & Technical Visualization II** English 4
Fundamentals of Technology	**Computer Engineering Technology I**	**Computer Engineering Technology II**	
Career Management	**Principles of Technology I**	**Principles of Technology II**	**T&I Co-op Training I** (2 credits)
Digital Communication Systems	**Drafting I**	**Electronics I**	**Electronics II** (2 credits)

Other Courses in Pathway: Technology Advanced Studies; Small Business Entrepreneurship; Introduction to Trade & Industrial Education; Digital Media I; Drafting II & III–Engineering; Communication Systems; Manufacturing Systems; Structural Systems; Transportation Systems

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Technology Student Association (TSA)
- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Computer Engineering Technology • Electronics Engineering Technology • GIS/Global Positioning	Examples: • Electronic System Technician • Electronics Technician • Chemical Engineering Technician	Examples: • Electrical Engineering • Mechanical Engineering • Communication Engineering • Chemistry	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Aerospace Engineer*
- *Architectural Engineer*
- *Physicist*
- *Research Technician*
- *Science Teacher*
- *Quality-Control Technician*
- *Science Technician*

Career Map: Scientific and Technical Visualization

Workers in Scientific and Technical Visualization analyze and communicate scientific and technical concepts and principles using computer graphics technology as well as the arts to create data-driven and conceptual graphic models. This pathway provides an excellent foundation for occupations in technology, engineering, science, and the arts.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	Chemistry	Elective
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Foundations of IT recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Drafting I	**Scientific & Technical Visualization I**	**Scientific & Technical Visualization II**	**Digital Media I**
Fundamentals of Technology	**Communication Systems**	**Principles of Technology I**	**Principles of Technology II**
Computer Applications I	Elective	Elective	**Trade & Industrial Co-Op Training 1** (2 credits)

Other Courses in Pathway: T&I Apprenticeship Method; T&I Internship; T&I Advanced Studies; Drafting II & III–Engineering; Technology Advanced Studies; Networking I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Scientific Graphics Technology • Advertising & Graphic Design	Examples: • Illustrator–Technical, Medical, & Scientific • Cartoonist–Motion Picture	Examples: • Art • Graphic Design • Fine/Studio Arts • Advertising	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Art Director*
- *Cartoonist*
- *Multimedia Artist and Animator*
- *Special Effects Technician*
- *Virtual Reality Specialist*
- *Technical, Medical, and Scientific Illustrator*

Career Map: Biotechnology Research and Development

Biotechnology Research and Development workers pursue advances in science and technology to support and improve the diagnosis and treatment of disease. These employees, often working in laboratories and offices in healing settings, perform scientific procedures that further the delivery of healthcare.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Elective (mathematics recommended)
Earth & Environmental Science	Biology	Chemistry	Elective (science recommended)
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective	Elective	
Health Team Relations	**Biomedical Technology**	**Allied Health Sciences I or Medical Sciences I**	**All. Hlth. Scs. II** (2 credits) or **Medical Sciences II**
Elective	Elective	Elective (Anatomy & Physiology recommended)	**Advanced Health Sciences Studies**
Elective	Elective (foreign language recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)

Other Courses in Pathway: Small Business Entrepreneurship, Computer Applications I, Digital Communication Systems

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Health Occupations Students of America (HOSA)
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Clinical Trials Research • Lab/Instrumentation • Quality Control Assurance • Research Assistantship	Example: • Laboratory Technician	Examples: • Biochemistry • Biostatistics • Genetics • Microbiology • Pharmaceutical Science	Examples: • Military Service • On-the-Job Training	Examples: • Certified Nursing Assistant (CNA) • Emergency Medical Technician (EMT) • Pharmacy Technician

CAREER OPTIONS

- *Biochemist*
- *Biostatistician*
- *Geneticist*
- *Lab Technician*
- *Microbiologist*
- *Molecular Biologist*
- *Pharmaceutical Scientist*
- *Quality Control Technician*
- *Research Scientist*
- *Toxicologist*

Career Map: Diagnostic Services

Diagnostic Services create a picture of a client's health at a single point in time. Diagnostic health team members conduct procedures designed to provide information from which a diagnosis may be made.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Elective (mathematics recommended)
Earth & Environmental Science	Biology	Elective (Chemistry recommended)	Elective (Physics recommended)
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective (foreign language recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Health Team Relations	**Biomedical Technology**	**Allied Health Sciences I or Medical Sciences I**	**All. Hlth. Scs. II** (2 credits) or **Medical Sciences II**
Elective	Elective	Elective (Anatomy & Physiology recommended)	**Advanced Health Sciences Studies**
Elective	Elective	Elective	

Other Courses in Pathway: Computer Applications I, Digital Communication Systems, Foods I–Fundamentals, Parenting & Child Development

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Health Occupations Students of America (HOSA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Cardiovascular Technology • Cytotechnology • Medical Sonography • Radiologic Technology	Examples: • Medical Laboratory Technician • Radiographer • X-Ray Equipment Tester	Examples: • Clinical Laboratory Science • Genetics • Exercise Physiology • Medical Technology	Examples: • Military Service • On-the-Job Training	Examples: • Certified Nursing Assistant (CNA) • First Aid/CPR • Emergency Medical Technician (EMT)

CAREER OPTIONS

- *Cardiovascular Technologist*
- *Clinical Lab Technician*
- *ECG/EEG Technologist*
- *Exercise Physiologist*
- *Mammographer*
- *Medical Sonographer*
- *Medical Technologist*
- *Nutritionist*
- *Phlebotomist*
- *Radiologic Technologist*

Career Map: Health Informatics Services

Workers in Health Informatics Services document patient care. Such record keeping results in individual histories that support healthcare maintenance, problem solving, and decision making.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry	Algebra II	Elective (mathematics recommended)
Earth & Environmental Science	Biology	Chemistry	Elective (Physics recommended)
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective (foreign language recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Health Team Relations	**Biomedical Technology**	**Allied Health Sciences I or Medical Sciences I**	**All. Hlth. Scs. II** (2 credits) or **Medical Sciences II**
Elective	Elective	Elective (Anatomy & Physiology recommended)	**Advanced Health Sciences Studies**
Elective	Elective	Elective	

Other Courses in Pathway: Computer Applications I, Digital Communication Systems, Foods I–Fundamentals, Parenting & Child Development

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Health Occupations Students of America (HOSA)
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Health Information • Medical Coding • Medical Transcription • Medical Office Administration	Example: • Medical Secretary	Examples: • Computer Science • Epidemiology • Healthcare Administration • Health Information Administration	Examples: • Military Service • On-the-Job Training	Examples: • Certified Nursing Assistant (CNA) • Emergency Medical Technician (EMT) • Pharmacy Technician

CAREER OPTIONS

- *Healthcare Administrator*
- *Health Unit Coordinator*
- *Medical Assistant*
- *Medical Illustrator*
- *Medical Office Manager*
- *Medical Records Technician*
- *Medical Transcriptionist*
- *Social Worker*

Career Map: Support Services

Support Services workers create and maintain a healthcare delivery environment that supports diagnosis and therapy. They maintain the healthcare setting in a way that ensures the safe and efficient delivery of care.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry	Algebra II	Elective (mathematics recommended)
Earth & Environmental Science	Biology	Chemistry	Elective (Physics recommended)
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (foreign language recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Health Team Relations	**Biomedical Technology**	**Allied Health Sciences I or Medical Sciences I**	**All. Hlth. Scs. II** (2 credits) or **Medical Sciences II**
Elective	Elective	Elective (Anatomy & Physiology recommended)	**Advanced Health Sciences Studies**
Elective	Elective	Elective	Elective (Principles of Technology I recommended)

Other Courses in Pathway: Small Business Entrepreneurship, Computer Applications I, Digital Communication Systems

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Health Occupations Students of America (HOSA)
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Biomedical Equipment Technology • Dietetics • Facility Maintenance Technology	Examples: • Biomedical Equipment Technician • Healthcare Sanitary Technician	Examples: • Biomedical Engineering • Environmental Health • Occupational Health & Safety	Examples: • Military Service • On-the-Job Training	Examples: • Certified Nursing Assistant (CNA) • First Aid/CPR • Emergency Medical Technician (EMT)

CAREER OPTIONS

- *Biomedical/Clinical Engineer/Technician*
- *Central Service Technician*
- *Facilities Manager*
- *Industrial Hygienist*
- *Hospital Maintenance Engineer*
- *Materials Management Engineer*

Career Map: Therapeutic Services

Workers in Therapeutic Services deliver a variety of treatment and care regimens that maintain or improve the health status of patients over time. These workers include physicians, veterinarians, dentists, psychologists, and the various people who assist them in the delivery of car

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry	Algebra II	Elective (mathematics recommended)
Earth & Environmental Science	Biology	Chemistry	Elective (science recommended)
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective (foreign language recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Health Team Relations	**Biomedical Technology**	**Allied Health Sciences I or Medical Sciences I**	**All. Hlth. Scs. II** (2 credits) or **Medical Sciences II**
Elective	Elective (Sports Medicine recommended)	Elective (Anatomy & Physiology recommended)	**Advanced Health Sciences Studies**
Elective	Elective	Elective	

Other Courses in Pathway: Small Business Entrepreneurship, Computer Applications I, Parenting and Child Development, Digital Communication Systems, Foods I–Fundamentals

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Health Occupations Students of America (HOSA)
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Dental Hygiene • Nursing Assistantship • Practical Nursing • Orthodontic Technology • Prosthetics	Example: • Not applicable	Examples: • Midwifery • Nursing • Pharmacy • Occupational Therapy • Veterinary Medicine	Examples: • Military Service • On-the-Job Training	Examples: • Certified Nursing Assistant (CNA) • Emergency Medical Technician (EMT) • Pharmacy Technician

CAREER OPTIONS

- *Athletic Trainer*
- *Certified Nursing Assistant*
- *Chiropractor*
- *Dental Lab Technician*
- *Dentist*
- *Dietician*
- *Massage Therapist*
- *Mortician*
- *Pharmacist*
- *Physical Therapist/Assistant*
- *Optometrist*
- *Respiratory Therapist*

Career Map: Metals Manufacturing Technology

Workers in Metals Manufacturing design, fabricate, and repair metal products using a variety of metalworking equipment and processes.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environment Science	Biology	**Principles of Technology I**	**Principles of Technology II**
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective		**T&I Cooperative Training I** (2 credits)
ITIE or Fundamentals of Technology	**Manufacturing Systems**	**Welding I**	**Welding Technology I**
Computer Applications I	**Drafting I**	Elective	Elective
Elective	**Metals Manufacturing Technology I**	**Metals Manufacturing Technology II** (2 credits)	**Trade & Industrial Advanced Studies**

Other Courses in Pathway: Trade & Industrial Apprenticeship Method, Trade & Industrial Internship, Trade & Industrial Cooperative Training II, Electronics I, Welding II, Digital Communication Systems, Career Management

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Technology Student Association (TSA)
- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Facility Maintenance Technology • Industrial Engineering Technology • Machining Technology	Examples: • Die Designer • Machinist • Machine Setter • Engine-Lathe Set-Up Operator	Examples: • Industrial Manufacturing • Industrial Manufacturing Technology • Industrial Production Technology	Examples: • Military Service • On-The-Job Training	Example: • Precision Machining Level 1

CAREER OPTIONS

- *Industrial Machinery Repairer*
- *Materials Engineer*
- *Machinist and Numerical Control Machine Tool Programmer*
- *Metalworking and Plastics-Working Machine Operator*
- *Millwright*
- *Teacher*
- *Tool and Die Maker*

Career Map: Welding Technology

Welders design, fabricate, and repair metal products using a variety of welding and cutting processes.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	**Principles of Technology I**	**Principles of Technology II**
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective		**Metals Manufacturing Technology I**
ITIE or Fundamentals of Technology	**Welding I**	**Welding II** (2 credits)	**Trade & Industrial Advanced Studies**
Computer Applications I	**Drafting I**	**T&I Cooperative Training I** (2 credits)	**T&I Cooperative Training II** (2 credits)
Elective	**Manufacturing Systems**		

Other Courses in Pathway: T&I Apprenticeship Method, T&I Internship, Electronics I, Small Business Entrepreneurship, Career Management, Digital Communication Systems, Metals Manufacturing II

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Technology Student Association (TSA) • SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples • Facility Maintenance Technology • Industrial Engineering Technology • Welding Technology	Examples: • Boilermaker • Boilermaker Fitter • Metal Fabricator • Ornamental Iron Worker • Welder	Examples: • Industrial Technology Education • Technology Education • Technology/Industrial Arts Education	Examples: • Military Service • On-the-Job Training	Example: • Industry Identified

CAREER OPTIONS

- *Cutters*
- *Industrial Machinery Repairers*
- *Millwright*
- *Pipefitter*
- *Steamfitter*
- *Structural and Reinforcing Metal Workers*
- *Welders*
- *Welding Machine Operators*
- *Welding Engineers*

Career Map: Consumer Services

Workers in consumer services assist individuals with decisions and problems relating to finance, real estate, insurance, and the purchase of consumer goods.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective (Sociology recommended)	Elective (Spanish I recommended)	Elective (Spanish II recommended)
Teen Living	**Parenting & Child Development**	**Foods I–Fundamentals**	**Life Management**
Digital Communication Systems	**Computer Applications I**	**Housing & Interiors I**	**Apparel Development I**
Elective (Principals of Bus. & Pers. Finance recommended)	Elective (Computerized Accounting I recommended)	Elective (Business Law recommended)	**Small Business Entrepreneurship**

Other Courses in Pathway: Career Management; Culinary Arts and Hospitality I; Early Childhood Education I & II; Family and Consumer Sciences Advanced Studies; Foods II–Advanced

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Family, Career, and Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Business Administration/ Customer Service • Health Care Management • Library & Information Technology	Example: • Not applicable	Examples: • Consumer & Family Sciences • Economics • Business Administration • Accounting	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Consumer Credit/Counselor*
- *Consumer Research Department Representative*
- *Certified Financial Planner*
- *Consumer Advocate*
- *Consumer Affairs Officer*
- *Consumer Service Representative*
- *Financial Advisor*
- *Employee Benefits Representative*
- *Market Researcher*

Career Map: Cosmetology

Cosmetologists cut, style, color, and wave hair and advise patrons on how to care for their hair, skin, nails, and scalp.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Technical Mathematics I	Technical Mathematics II	Elective
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Art I recommended)	Elective	
Teen Living	**Apparel Development I**	**Cosmetology I** (3 credits)	**Cosmetology II** (3 credits)
Introduction to Trade & Industrial Education	Elective		**Small Business Entrepreneurship**
Career Management	Elective		**Life Management**

Other Courses in Pathway: Digital Communications Systems, Foods I–Fundamentals, Housing & Interiors I, Computer Applications I

Work-Based Learning Opportunities	Career-Technical Student Organizations
• Apprenticeship • Job Shadowing • Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• SkillsUSA–The Student Organization for Trade & Industrial Education • Family, Career, and Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Cosmetologist • Manicurist • Esthetician • Nail Technician • Cosmetology Teacher	Example: • Cosmetologist	Example: • Not applicable	Examples: • Military Service • On-the-Job Training	Example: • Cosmetology License

CAREER OPTIONS

- *Competition Stylist*
- *Cosmetology Instructor*
- *Electrologist*
- *Field Technician*
- *Licensed Cosmetologist*
- *Make-up Artist*
- *Manager-Operator*
- *Manufacturer's Representative*
- *Nail Technician*
- *Platform Stylist*
- *Salon Owner*

Career Map: Early Childhood Development and Services

Workers in Early Childhood Development and Services nurture and teach children, as well as enhance family wellness. They provide services in childcare centers, nursery schools, preschools, public schools, private households, family childear homes, and before- and after-school programs for children from birth through age eight.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Elective
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Sociology recommended)	Elective (Spanish I recommended)	Elective (Spanish II recommended)
Teen Living	**Parenting & Child Development**	**Early Childhood Education I** (2 credits)	**Early Childhood Education II** (2 credits)
Digital Communication Systems	**Computer Applications I**	**Foods I–Fundamentals**	**Life Management**
Elective	Elective		**Small Business Entrepreneurship**

Other Courses in Pathway: Apparel Development I, Career Management, Computer Applications I, Culinary Arts & Hospitality I, Family & Consumer Sciences Advanced Studies, Food II–Advanced, Housing & Interiors I

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Family, Career, and Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Childcare and Parenting • Child Development	Example: • Child Care Development Specialist	Example: • Child Development and Family Relations with concentration in Early Childhood Education or Child and Family Studies	Examples: • Military Service • On-the-Job Training	Example: • Child Care License

CAREER OPTIONS

- *Assistant Director, Childcare Facilities*
- *Childcare Assistant Worker*
- *Director, Childcar e Facilities*
- *Educator for Parents*
- *Nanny*
- *Preschool Teacher*
- *Teacher Assistant*
- *Family Social Worker*

Career Map: Family and Community Services

Workers in Family and Community Services help the homeless and infirm cope with the circumstances of daily living, counsel emotionally disturbed individuals, train the unemployed, care for the elderly and the disabled, help the needy obtain financial assistance, and solicit contributions for various social services organizations.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	Chemistry	Physics
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Sociology recommended)	Elective (foreign language recommended)	Elective (Spanish II recommended)
Teen Living	**Parenting & Child Development**	**Foods I–Fundamentals**	**Family & Consumer Sciences Advanced Studies**
Digital Communication Systems	**Computer Applications I**	**Early Childhood Education I** (2 credits)	**Early Childhood Education II** (2 credits)
Career Management	Elective		**Life Management**

Other Courses in Pathway: Apparel Development I, Culinary Arts and Hospitality I, Foods II–Advanced, Housing and Interiors I, Small Business Entrepreneurship

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship • Cooperative Education • Job Shadowing	• Paid/Unpaid Internship • School-Based Enterprise • Service Learning	• Family, Career, and Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Childcare and Parenting • Child Development	Examples: • Child Care Development Specialist • Youth Development Practitioner	Examples: • Human Services • Rehabilitation • Social Work • Family & Consumer Sciences	Examples: • Military Service • On-the-Job Training	Example: • None at present

CAREER OPTIONS

- *Adult Day Care Worker*
- *Community Service Director*
- *Coordinator of Volunteers*
- *Emergency and Relief Worker*
- *Geriatric Service Worker*
- *Grief Counselor*
- *Social and Human Services Assistant*
- *Social Services Worker*

Career Map: Foods, Nutrition, and Wellness

Workers in Foods, Nutrition, and Wellness perform food production and management activities in all aspects of the business. Career opportunities may be found in small niche businesses, catering, or even businesses run out of the home.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	**FACS Advanced Studies**
World History	Civics & Economics	U.S. History	Elective
Health/Physical Education	Elective (Business & Electronic Communications recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Teen Living	**Foods I–Fundamentals**	**Foods II—Advanced**	**FACS Apprenticeship/ Internship**
Computer Applications I	Elective	**Small Business Entrepreneurship**	**Life Management**
Elective (Art I recommended)	Elective (Art II recommended)	Elective (Marketing recommended)	Elective (Marketing Management recommended)

Other Courses in Pathway: Culinary Arts & Hospitality I, Career Management, Digital Communication Systems

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Family, Career, & Community Leaders of America (FCCLA)

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Culinary Technology • Hotel & Restaurant Management • Travel & Hospitality	Examples: • Baker • Butcher • Candy Maker • Cook/Chef • Food Service Manager	Examples: • Food, Nutrition, & Food Service Management • Culinary Arts • Food & Nutrition–Dietetics	Examples: • Military Service • On-the-Job Training	Example: • ServSafe

CAREER OPTIONS

- *Baker*
- *Banquet and Catering Sales*
- *Caterer*
- *Chef*
- *Kitchen Supervisor*
- *Line Cook*
- *Sous Chef*

Career Map: Restaurant and Food Services

Workers in Restaurant and Food Services produce and manage food services in restaurants, hotels, country clubs, resorts, hospitals, nursing homes, military installations, bakeries, cruise ships, airlines, public schools, universities, and industries. Food industry workers typically perform production and management activities in both the front of the house and the back of the house.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective (Travel, Tourism, & Rec. Marketing recommended)
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Speech I recommended)	Elective (foreign language recommended)	Elective (foreign language recommended)
Teen Living	**Foods I–Fundamentals**	**Culinary Arts & Hospitality I** (2 credits)	**Culinary Arts & Hospitality II** (2 credits)
Digital Communication Systems	Elective (Business & Electronic Communications recommended)		**Life Management or FACS Advanced Studies**
Elective (Art I recommended)	Elective (Art II recommended)	Elective (Art III recommended)	**Small Business Entrepreneurship**

Other Courses in Pathway: Food Science, Computer Applications I, Career Management, Foods II–Advanced

Work-Based Learning Opportunities		Career-Technical Student Organizations
• Apprenticeship	• Paid/Unpaid Internship	• Family, Career, & Community Leaders of America (FCCLA)
• Cooperative Education	• School-Based Enterprise	
• Job Shadowing	• Service Learning	

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Culinary Technology • Hotel & Restaurant Management • Travel & Hospitality	Examples: • Baker • Butcher • Candy Maker • Cook • Meat Cutter	Examples: • Food, Nutrition, & Food Service Management • Culinary Arts • Food Systems Management	Examples: • Military Service • On-the-Job Training	Example: • ServSafe®

CAREER OPTIONS

- *Baker*
- *Banquet and Catering Salesperson*
- *Caterer*
- *Dietary Manager*
- *Executive Chef*
- *Food and Beverage Manager*
- *Food Broker*
- *Kitchen Supervisor*
- *Maitre D'hotel*
- *Restaurant Manager*

Career Map: Automotive Systems Technology

Automotive systems technicians service, maintain, and repair automobiles, trucks, and related transportation vehicles and components that serve the auto industry.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective (Welding I recommended)
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective	Elective	
ITIE or Fundamentals of Technology	**Automotive Service Technology I**	**Automotive Service Technology II** (2 credits)	**Automotive Service Technology III** (2 credits)
Computer Applications I	**Drafting I**	**Principles of Technology I**	Elective (Principles of Technology II recommended)
Elective	**Electronics I**		Elective (Electronics II recommended–2 credits)

Other Courses in Pathway: Small Business Entrepreneurship; Trade & Industrial Advanced Studies; Trade & Industrial Cooperative Training I & II; Career Management; Digital Communication Systems; Transportation Systems

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

- Technology Student Association (TSA)
- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Example: • Automotive Systems Technology • Marine Propulsion Systems • Motorcycle Mechanics	Examples: • Automotive Technician • Automotive Machinist • Marine Engine Machinist • Aircraft Mechanic	Examples: • Applied Science Technologies • General Engineering • Mechanical Engineering • Automotive Engineering	Examples: • Military Service • On-the-Job Training	Example: • Automotive Service Excellence (ASE)

CAREER OPTIONS

- *Automotive Service Technician*
- *Brake Technician*
- *Driveability Technician*
- *Electrical/Electronic Technician*
- *Garage Owner and Auto Parts Person*
- *Service Manager*
- *Shop Supervisor*
- *Transmission/Transaxle Technician*

Career Map: Collision Repair

Workers in Collision Repair are experts in the construction of the automobile body and have mastered techniques of collision repair, auto body rebuilding, and refinishing.

Secondary Career Development Schedule *(Pathway courses are listed in bold type.)*

Grade 9	Grade 10	Grade 11	Grade 12
English I	English II	English III	English IV
Algebra I	Geometry or Technical Mathematics I	Algebra II or Technical Mathematics II	Advanced Functions & Modeling
Earth & Environmental Science	Biology	A physical science	Elective
World History	Civics & Economics	U.S. History	
Health/Physical Education	Elective (Welding I recommended)	Elective (Welding II recommended—2 credits)	
ITIE or Fundamentals of Technology	**Collision Repair Technology I**	**Collision Repair Technology II** (2 credits)	**Trade & Industrial Advanced Studies**
Digital Communication Systems	**Electronics I**	Elective	**Trade & Industrial Co-op Training I** (2 credits)
Elective	**Automotive Service Technology I**		**Small Business Entrepreneurship**

Other Courses in Pathway: Trade & Industrial Cooperative Training II, Transportation Systems

Work-Based Learning Opportunities

- Apprenticeship
- Cooperative Education
- Job Shadowing
- Paid/Unpaid Internship
- School-Based Enterprise
- Service Learning

Career-Technical Student Organizations

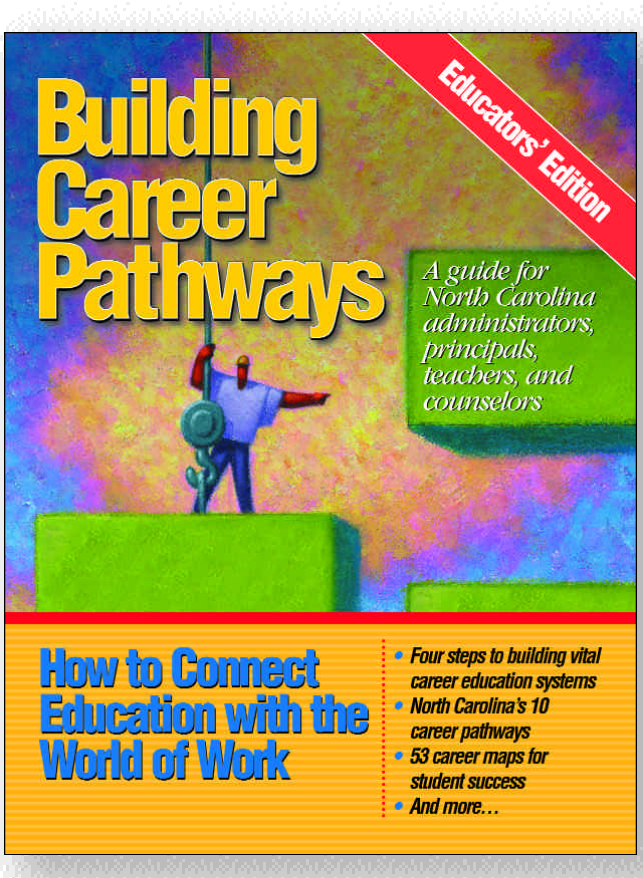
- Technology Student Association (TSA)
- SkillsUSA–The Student Organization for Trade & Industrial Education

POSTSECONDARY OPTIONS

Community College or Proprietary Programs	Adult Registered Apprenticeships	Four-Year College and University Programs	Other	Certifications
Examples: • Auto Body Repair • Automotive Parts Sales Representative • Insurance Adjuster	Examples: • Auto Body Repairer • Auto Body Estimator • Aircraft Body Technician	Examples: • Applied Science Technologies • Mechanical Engineering • Automobile Design • Automotive Engineering	Examples: • Military Service • On-the-Job Training	Examples: • I-CAR • Automotive Service Excellence (ASE)

CAREER OPTIONS

- *Automotive Parts Person*
- *Automotive Refinisher*
- *Auto Upholsterer*
- *Business Owner*
- *Collision Body Repair Technician*
- *Collision Estimator*
- *Glass Technician*
- *Structural and Non-structural Repairer*



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