In **Unit One**, students read and analyzed graphs about the labor market in general, and learned about job trends specific to the Technology sector. They also learned about the different types of employers in this sector.

In **Unit Two**, students reflected on their own work history, as well as their personal values and interests. They also practiced using career databases such as New York State’s CareerZone and Career Cruising.

In **Unit Three**, students learn about different factors that impact the choice to change careers. They also learn about different career paths in Technology, as well as how to access the training and education required to pursue these careers. Although there are some jobs in Technology that don’t require college degrees, many well-paying careers with the potential for advancement require college degrees.

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### 1 · **CALCULATING WITH BAR GRAPHS: EDUCATION PAYS**

Students read and discuss a graph about levels of educational attainment as they relate to annual earnings, and calculate differences in earnings between various levels of education.

### 2 · **READING TECHNOLOGY CAREER MAPS**

Students read career maps in Information Technology, technical positions in Media and Advertising, and/or Help Desk careers. They discuss the level of education required at each job level and potential paths of advancement in the field.

### 3 · **DENISE’S TECHNOLOGY CAREER MOVEMENT STORY**

Students read a letter about career change from a customer service employee turned IT field technician. They create a map of her moves, including actions taken that made each move possible.

#### 3.1 • Denise’s Career Map

Drawing on their experiences with map-reading, students consider the trajectory Denise took and portray it as a map. They focus on the steps she took to move from one job to another.
4. TECHNOLOGY JOB TRAINING SERIES

Students learn about job training programs—what they are, how to find a good one, what to expect as a participant, and read case studies of high-quality training programs for Technology careers.

4.1 • Job-seeker Terminology
Students learn vocabulary relevant to a job search in any sector, by matching job search terms to their definitions.

4.2 • Know Before You Enroll
Students read a tip sheet and discuss advice about how to find a reputable job training program. They then write letters of advice to friends or family members who might want to enroll in a training program.

4.3 • Developing Questions: Researching Job Training Programs in Technology*
Students develop questions to ask before applying to job training programs, and use them to research CUNY and other respected training programs for cable installers, production assistants, security system installers and more.

5. CUNY CAN GET YOU THERE SERIES: CUNY PROGRAMS IN INFORMATION TECHNOLOGY*

Students are introduced to some CUNY Technology programs and resources to research them, including the CUNY college websites and the Discover CUNY chart of majors.

5.1 • Researching CUNY Degree and Certificate Programs in Information Technology (IT)*
Students learn how to navigate a college website to locate information about degree and certificate programs by exploring the Information Technology (IT) programs on one CUNY campus website.

5.2 • Understanding Degree Program Requirements*
Students look at a sample IT major at a CUNY college and discuss the relevance of general education requirements to the major.

5.3 • CUNY IT Certificates: A+ Certification and BICSI Cable Installation*
Students look at two Information Technology certificates offered at one CUNY campus.

5.4 • How Do I Enroll in CUNY?*
Students learn the steps needed in applying to CUNY certificate and degree programs.

*RAENs will provide regional adaptations.
Calculating With Bar Graphs: 
Education Pays

Students read a graph about lifetime earnings and education attainment, then perform computations based on the numbers.

PREP

- **Read** the graph, *Average Lifetime Earnings and Educational Attainment*
- **Write** the following Agree/Disagree statements on the board:

  People with more education usually earn more money than those with less education.

  People with high school/HSE diplomas usually earn the same amount of money as those who don't have a HS diploma or HSE.

  People who have started college, but not yet earned a degree, earn the same amount as HSE diploma holders who have not had any college.

  People who go to college will be rewarded financially.

MATERIALS

- *Average Lifetime Earnings and Educational Attainment* graph
- *Calculating Earnings* worksheet

EXPLAIN

1. Pursuing higher levels of education and training is a big step. It requires time, money, excellent organization, especially if you have a job and/or family responsibilities, and a lot of hard work. Some people believe it will really help them get ahead financially and professionally. Other people wonder if it is worth the sacrifice. What do you think? Discuss with a partner whether you agree or disagree with the statements on the board.

2. Researchers for the *American Community Survey* had some of these same questions, and studied if people who had higher levels of education earned more money than those with lower levels of education. They found out how much money people earned during their lifetimes, and whether or not their education played a role. Read the graph below to find out what they learned.

3. Distribute the graph.
Average Lifetime Earnings and Educational Attainment

Credit: NYC Labor Market Information Service

* Includes postsecondary certification and technical training.
** Includes medical doctors, lawyers, dentists, and others.


Prepared by The NYC Labor Market Information Service at The Graduate Center, CUNY.

Credit: NYC Labor Market Information Service
**DISCUSSION QUESTIONS**

What does the title mean?

- *The median salary earned by workers in 2014 according to their highest level of education completed. Median means that half the salaries were higher and half were lower.*

What does each bar in the graph represent? Does each dollar figure represent the amount of money everyone with that educational level earned?

- *No, it is the average median salary earned at that education level.*

What does median mean?

- *Median is one way to get a general idea about data. For example, in terms of this graph, does everyone with at least and only a HS or HSE diploma make $36,000 a year? No, there are lots of different salaries. The same is true for all of the other educational levels. We use different ways to determine a general picture of a set of data. Mean (which you may have heard called “average”) is one of them. The way we figure out the median is to take all the salaries of people with only a HS or HSE diploma and imagine them all lined up in order of their salary, from lowest to highest. The salary of the person in the middle is the median salary. That gives us a general idea about what to expect in salary for a person with a HS or HSE diploma.*

What trend or pattern do you notice?

- *Higher the education, the greater the earnings. Some show large jumps. Other increases are smaller.*

What are 3 examples of professional degrees?

- *MD—Medical Doctor, DDS—Doctor of Dental Surgery, M. Arch—Master in Architecture*

4 Distribute the *Calculating Earnings* worksheet. Ask students to work on the problems then discuss them as a class.
Section 1

Calculating Earnings

1. How much more money does someone with a diploma earn than someone who never earns a diploma? Show your work below.

2. Write one sentence explaining what you did to solve this problem.

3. How much more money does someone with an Associates degree earn than someone with only a HS/HSE diploma? Show your work below.
Reading Technology Career Maps

Students read a brochure on careers and career pathways in Information Technology, Media and Advertising and/or Help Desk careers, then work to organize the information and infer the personal qualities and skill requirements necessary for each career. Lastly, they develop questions they have about the careers.

PREP

1. Read the three Technology career brochures included in this lesson and choose the one that seems most relevant to your class. Or you may decide to discuss more than one. Choose the page or pages you will assign students to read and annotate.
   - *Mapping Your Future: Information Technology* describes technical careers in a variety of sectors.
   - *Mapping Your Future: Careers in Media and Advertising* presents technical careers in radio, television, film, print and online media.
   - *Tech Support and Beyond* focuses on help desk and related careers.

2. Select four careers you want students to focus on and write them in the Careers column of the worksheet, *Careers in Technology*.

3. Write the following questions on the board:
   - What do you know about Information Technology (or Media/Advertising or Tech Support) or what do you think it is?
   - How do you know or what makes you think this?
   - What kinds of jobs do you think people who work in Information Technology (or Media/Advertising or Tech Support) do?

MATERIALS

- *Mapping Your Future: Information Technology* handout
- *Careers in Media and Advertising*
- *Tech Support & Beyond*
- *Careers in Technology* worksheet
EXPLAIN

4. Ask students to freewrite for 5-10 minutes in response to the questions on the board.

5. When students are finished, have them share their freewrites with a partner.

6. Distribute pages from the reading or readings you have selected and ask students to read and annotate the parts that you have selected. Ask students to annotate anything that seems important, interesting, or confusing. While they read, they should take note of things they already knew about the field from their pre-writing exercise and new things they learned about it.

DISCUSS

• What do you know now about the field that you didn’t know before reading the career brochure?

• Were you surprised by anything new that you learned?

• If you or someone you know were interested in a career in this field, what are some actions you could take to find out more?

  › Conduct an informational interview with someone working in the field, explore your personal interests and strengths, use the brochure to answer questions about specific jobs within the field.

• Describe one career that you read about that sounds interesting to you.

7. When students are finished, distribute the Careers in Information Technology worksheet and review it. Review the meaning of each category, particularly the difference between a skill (an ability, usually learned, such as driving a car) and a characteristic (a personal trait, such as having a natural interest in mathematical tasks). Ask students to complete the worksheet in pairs.

8. When pairs are finished, discuss their answers as a class.
Mapping Your Future

Information Technology

What is Information Technology (IT)?

Every industry needs to collect, analyze, and manage information. The IT industry is about using technology to do just that. New York City is home to large and small IT companies. Some companies specialize in computer systems. Others develop consumer “apps” like games and social networking. Still, others specialize in IT within other industries like healthcare and finance. Every industry needs to collect and manage information so people with IT skills can find jobs in almost any industry.

There are software and hardware jobs in IT. Hardware jobs deal with computer systems and networks. With more people using smart phones and tablets, the number of hardware jobs has increased even more. Computer engineers design and develop computer systems—the physical structures of a computer such as circuits, networks etc. Software engineers develop programs that run on the hardware. Software jobs have grown because of the Internet.

Entry-level jobs include help desk specialists and field technicians. Help-desk specialists work with users to solve their technological problems. Field technicians install equipment for users. Currently, there is a huge demand for higher-level IT positions and the demand is expected to increase in the future. Examples of higher-level IT positions include programmers and web developers. These jobs require a four-year degree and a substantial amount of technical knowledge and expertise.

The industry changes so fast that people in IT need to be able to learn quickly and be flexible. Most IT jobs are salaried, but there are freelance jobs too.

What you know, how well you know it, and how well you communicate your knowledge and skills are especially important in the interview process for technology jobs. Even more important, how well you are paid will depend on your combined knowledge, skill, and experience. At any given time, there are programming languages and software applications that are in high demand. It is important to know which ones employers are looking for when you are interviewing for a job.
Put Yourself on the Map: How to Use This Brochure

Like any map, this Career Map helps you find your way to new places—in this case, a bunch of careers within one specific industry. (An industry is a loosely defined area of businesses engaged in similar work.) As you read, ask yourself: what different kinds of jobs are there? How does one job lead to the next? Which ones will I like? How much money can I earn, and how long will it take me to get there? What kind of training do I need?

One of the best ways to find a satisfying career is to get clear about your personal interests and strengths. What do you most enjoy doing? What do your friends, teachers, parents say you do best? Do you prefer to work with people, ideas or things? Do you want to be in charge, or work alongside your peers? Which of these jobs will let you be your best?

Once you’ve found a path that sounds like a good fit, it’s time to test it out. Find someone who works in the industry—ask your friends, parents, teachers and neighbors if they can introduce you. Ask if they are willing to talk with you for a few minutes. This is called an “informational interview.” You’re not asking them to find you a job; you’re only asking to listen and learn about their experience. If you ask in a professional manner, many people are happy to speak with you. (If you’re nervous about this, ask a teacher, guidance counselor or parent to help.)

Before you meet with the person, reread the brochure and write down any questions you have, for example:

- What do you spend your day doing in this job?
- How did you get started in this field?
- How much reading, writing or math do you do in your job?
- How do people dress at the work place?
- Do you have a routine set of tasks you do every day or do you do something different every day?
- Do you work the same schedule every week, or does it change?
- What courses would I take in high school or college to prepare for this job?
- What is my next step after high school if I am interested in this field?
- Where can I find people who can help me learn more about this field?

Make sure to send a thank you note, and in no time you’ll be on your way. For more information about this industry and many others, you can visit www.careerzone.ny.gov
# Types of Employment

<table>
<thead>
<tr>
<th>HOURS/WEEK</th>
<th>SCHEDULE</th>
<th>WAGE/SALARY</th>
<th>PAYMENT</th>
<th>COMMON BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time</td>
<td>Usually 35+</td>
<td>Steady</td>
<td>Annual</td>
<td>Weekly or bi-weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Paid sick leave, vacation time, health insurance, retirement savings</td>
</tr>
<tr>
<td>Part-Time</td>
<td>Usually &lt;35</td>
<td>May vary</td>
<td>Hourly</td>
<td>Weekly or bi-weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Usually none</td>
</tr>
<tr>
<td>Temp</td>
<td>As available</td>
<td>May vary</td>
<td>Hourly</td>
<td>Weekly or bi-weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Usually none</td>
</tr>
<tr>
<td>Self-employed aka Freelance</td>
<td>Varies</td>
<td>Varies</td>
<td>Negotiate rate of pay with client</td>
<td>Upon completion of work or on a schedule of deliverables</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None: must pay own taxes and health insurance</td>
</tr>
<tr>
<td>Union</td>
<td></td>
<td></td>
<td>Typically higher than comparable non-union positions</td>
<td>As negotiated by the union with the employer on behalf of members</td>
</tr>
</tbody>
</table>

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**For Information about the NYC Department of Education CTE Programs:**

http://schools.nyc.gov/ChoicesEnrollment/CTE/ParentsandStudents/default.htm

http://CTECouncil.org

**For additional Information:**

http://computingcareers.acm.org

http://www.bls.gov/ooh/ocos305.htm

(Computer network, systems and database administrators)


**Where can I get additional general information on careers?**

For careers in New York State: www.careerzone.ny.gov

For general career information, including videos of nearly 550 careers: www.acinet.org

For general career information, visit: www.bls.gov/k12/
## Technical Jobs

### Increasing Levels of Education/Training Required

<table>
<thead>
<tr>
<th>Some College and/or Moderate Experience</th>
<th>College and Experience continued</th>
<th>College Plus Extensive Experience or Postgraduate Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Help Desk Specialist</strong></td>
<td><strong>Software Developer</strong></td>
<td><strong>Director, IT Security</strong></td>
</tr>
<tr>
<td>DUTIES: Answers users' questions and solves problems related to printing, word processing, email, and computer operating systems.</td>
<td>DUTIES: Develops, creates, and revises general computer applications software or specialized programs that address client needs.</td>
<td>DUTIES: Directs the strategic design, planning and implementation of network and information security management policies and programs.</td>
</tr>
<tr>
<td>PAY RANGE: $38,000 to $71,000 per year</td>
<td>PAY RANGE: $70,000-$121,000 per year</td>
<td>PAY RANGE: $67,000 to $154,000 per year</td>
</tr>
<tr>
<td><strong>Web Designer</strong></td>
<td><strong>Data Security Analyst</strong></td>
<td><strong>VP Software Development, Computer Engineering</strong></td>
</tr>
<tr>
<td>DUTIES: Designs and modifies websites to meet customer needs. May include creating sketches, designs, and layouts for online content and selecting size, style and arrangement of content.</td>
<td>DUTIES: Plans, implements, upgrades, monitors, and responds to breaches of security measures for networks and information.</td>
<td>DUTIES: Leads the engineering efforts for software development and/or computer engineering.</td>
</tr>
<tr>
<td>PAY RANGE: $38,000 to $75,000 per year</td>
<td>PAY RANGE: $61,000 to $109,000 per year</td>
<td>PAY RANGE: $125,000 and higher</td>
</tr>
</tbody>
</table>

### College and Experience

<table>
<thead>
<tr>
<th><strong>Database Administrator</strong></th>
<th><strong>Information Technology Project Manager</strong></th>
<th><strong>Quality Assurance Analyst</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DUTIES: Manages and updates databases, runs tests of the system and uses knowledge of database management systems to improve operations.</td>
<td>DUTIES: Plans, initiates, and manages information technology (IT) projects often acting as a liaison between business and technical staff.</td>
<td>DUTIES: Develops and executes test plans in order to identify hardware and software problems and their causes.</td>
</tr>
<tr>
<td>PAY RANGE: $56,000 to $105,000 per year</td>
<td>PAY RANGE: $67,000 to $154,000 per year</td>
<td>PAY RANGE: $53,000 to $117,000 per year</td>
</tr>
</tbody>
</table>

### Network and Systems Administrator

DUTIES: Installs, configures, monitors and supports all or part of local area (LAN) or wide area networks (WAN), or network Internet systems.

PAY RANGE: $60,000 to $105,000 per year

### Map Key

- **Expected to grow faster than average in the next 6 years.**
- Licensing or certification required.
- **Pay Range** Typical pay range from entry level to experienced. Jobs that are primarily part-time are expressed as hourly pay; jobs that are primarily full-time are shown with annual pay. Those that could be either are shown both ways.
- **Education** Minimum education and experience requirements. This may vary from employer to employer.

This flyer highlights some jobs, but not all jobs in this sector.
# Technical Jobs

INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED

## Some College and/or Moderate Experience

<table>
<thead>
<tr>
<th>Role</th>
<th>Duties</th>
<th>Pay Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech Retail Salesperson</td>
<td>Sells software, computers and peripherals—such as printers and monitors—to consumers in a retail setting.</td>
<td>$18,000 to $31,000 per year or $10 to $17 per hour</td>
</tr>
<tr>
<td>Sales Engineer</td>
<td>Sells IT hardware or services to business customers. Requires a technical background equivalent to a four-year degree in computer science or engineering.</td>
<td>$58,000 to $112,000 per year</td>
</tr>
</tbody>
</table>

## College and Experience

<table>
<thead>
<tr>
<th>Role</th>
<th>Duties</th>
<th>Pay Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR Specialist</td>
<td>Writes or selects material for release to various media to support the promotion or creation of a public image for IT firms and their products.</td>
<td>$44,000 to $92,000 per year</td>
</tr>
<tr>
<td>Marketing Specialist</td>
<td>Researches market conditions or creates campaigns to publicize IT products and services.</td>
<td>$45,000 to $89,000 per year</td>
</tr>
</tbody>
</table>

## College Plus Experience and/or Postgraduate Degree

<table>
<thead>
<tr>
<th>Role</th>
<th>Duties</th>
<th>Pay Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing Manager</td>
<td>Plans, directs, and coordinates IT marketing policies and programs.</td>
<td>$99,000 to over $200,000 per year</td>
</tr>
<tr>
<td>Sales Manager</td>
<td>Plans, directs, and coordinates the distribution of an IT product or service to the customer.</td>
<td>$105,000 to over $200,000 per year</td>
</tr>
<tr>
<td>VP Sales and Marketing</td>
<td>Manages staff that plans and directs the distribution of IT products or services to customers. Establishes sales territories, quotes, and goals for IT sales.</td>
<td>$175,000 and higher</td>
</tr>
</tbody>
</table>

### Did you know?
- There is a great demand for people with IT skills now and into the foreseeable future.
- Most positions require a four-year degree.
- Degrees in computer science, math, and engineering lead to IT jobs.
- People with IT skills can work in just about any industry.
Tech Jobs in Other Sectors

Almost all tech jobs in IT businesses can be found throughout all industry areas, from education and nonprofits to investment banks. Some industries have specialized information needs and use applications that are not used anywhere else. These industries hire professionals with both IT knowledge and skills in the specific industry where they are working. Below are a few examples of specialized tech jobs in healthcare, banking, and architecture.

<table>
<thead>
<tr>
<th>Some College and/or Experience</th>
<th>College and Some Experience</th>
<th>College Plus Extensive Experience and/or Postgraduate Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEALTH CARE</strong></td>
<td><strong>HEALTH CARE</strong></td>
<td><strong>HEALTH CARE</strong></td>
</tr>
<tr>
<td>Health Information Technician</td>
<td>Health Information Manager</td>
<td>Bioinformatics Programmer</td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Assembles patients’ health information, making sure that medical charts and forms are complete and correct. Communicates with healthcare professionals about diagnoses and treatments. Analyzes data to improve patient care, control cost, and provides documentation as required by law or for use in research studies.</td>
<td>Manages the analysis and transcription of health information systems. Ensures that coding is completed for the current billing cycle and done in accordance with hospital and government regulations.</td>
<td>Works with medical staff or faculty to develop computational solutions to problems in research (for example, gene sequencing) like improving efficiency, processing more data, and visualizing data.</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>$20,000 to $42,000 per year or $14 to $20 per hour</td>
<td>$15,000 to over $100,000 per year</td>
<td>$54,000 to $97,000 per year</td>
</tr>
<tr>
<td><strong>FINANCE</strong></td>
<td><strong>FINANCE</strong></td>
<td><strong>FINANCE</strong></td>
</tr>
<tr>
<td>Credit Analyst</td>
<td>Chief Information Officer</td>
<td>Chief Information Officer</td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Uses specialized software to produce drawings, layouts, sketches, maps, and graphic representations of architectural or engineering designs. Requires technical knowledge and often entails traveling to building project work sites.</td>
<td>Develops trading strategies for investment banks that maximize profit and minimize risk. Tests strategies with statistical modeling techniques using historical market data. Manages information and develops applications that enable traders and other analysts to access market data.</td>
<td>Directs the strategic design, acquisition, management, and maintenance of a firm-wide data storage, analysis, and reporting infrastructure. Develops, implements, and enforces rules and procedures to prevent security breaches.</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>$36,000 to $57,000 per year or $17 to $27 per hour</td>
<td>$55,000 to $130,000 per year</td>
<td>$150,000 and higher</td>
</tr>
<tr>
<td><strong>ARCHITECTURE and ENGINEERING</strong></td>
<td><strong>ARCHITECTURE and ENGINEERING</strong></td>
<td><strong>ARCHITECTURE and ENGINEERING</strong></td>
</tr>
<tr>
<td>Computer-Assisted Design (CAD) Technician</td>
<td>Building Automation Programmer</td>
<td>Director of Building Information Modelling</td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Uses specialized software to produce drawings, layouts, sketches, maps, and graphic representations of architectural or engineering designs. Requires technical knowledge and often entails traveling to building project work sites.</td>
<td>Assists senior engineering managers in developing and maintaining sophisticated automated building management systems. Runs backups, reports and test alarms and security systems.</td>
<td>Works with other executives in an engineering firm to develop best practices in building information modeling systems. Manages construction projects to ensure efficiency and less harm to the environment.</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>$36,000 to $57,000 per year or $17 to $27 per hour</td>
<td>$73,000 to $130,000 per year</td>
<td>$91,000 to $155,000 per year</td>
</tr>
</tbody>
</table>
Mapping Your Future

Media & Advertising

What is Media and Advertising?
New York City is one of the biggest media and advertising centers in the world. Advertising is a way of communicating used to persuade an audience. “Media” refers to the format used to get the message across to them. The industry includes advertising firms, public relations firms, newspapers, video and radio recording, broadcasting, movies, magazines, and books. Many people want to work in this industry but it can be hard to get your “foot in the door.” Qualified people may even take junior level and entry-level jobs just to break in. To get a job with a major firm, you may have to get an internship and show your value to the company before becoming a full-time employee.

In creative jobs, experience and talent are often more important than a degree or certificate. It is a fast-changing industry where adapting to change and learning new things is essential. Starting salaries can be lower than in other industries because it is seen as a fun, exciting industry. There are also a lot of tech jobs emerging, as more media campaigns use the Internet, smart phones, and tablets. There are salaried jobs and freelance opportunities in this industry. Marketing, public relations (PR) and advertising skills are needed in all types of industries. People with marketing, PR, and ad skills can find jobs in other industries too. Their skills are needed in many businesses, nonprofit and government agencies.

Put Yourself on the Map: How to Use This Brochure

Like any map, this Career Map helps you find your way to new places – in this case, a bunch of careers within one specific industry. (An industry is a loosely defined area of businesses engaged in similar work.) As you read, ask yourself: what different kinds of jobs are there? How could one job lead to the next? Which ones will I like? How much money can I earn, and how long will it take me to get there? What kind of training do I need?

One of the best ways to find a satisfying career is to get clear about your personal interests and strengths. What do you most enjoy doing? What do your friends, teachers, parents say you do best? Do you prefer to work with people, ideas or things? Do you want to be in charge, or work alongside your peers? Which of these jobs will let you be your best?

Once you’ve found a path that sounds like a good fit, it’s time to test it out. Find someone who works in the industry – ask your friends, parents, teachers and neighbors if they can introduce you. Ask if they are willing to talk with you for a few minutes. This is called an “informational interview.” You’re not asking them to find you a job; you’re only asking to listen and learn about their experience. If you ask in a professional manner, many people are happy to speak with you. (If you’re nervous about this, ask a teacher, guidance counselor or parent to help.)

Before you meet with the person, reread this brochure and write down any questions you have, for example:

- What do you spend your day doing in this job?
- How did you get started in this field?
- How much reading, writing or math do you do in your job?
- How do people dress at the work place?
- Do you have a routine set of tasks you do every day or do you do something different every day?
- Do you work the same schedule every week, or does it change?
- What courses would I take in high school or college to prepare for this job?
- What is my next step after high school if I am interested in this field?
- Where can I find people who can help me learn more about this field?

Make sure to send a thank you note, and in no time you’ll be on your way. For more information about this industry and many others, you can visit www.careerzone.ny.gov
### Types of Employment

<table>
<thead>
<tr>
<th>HOURS/WEEK</th>
<th>SCHEDULE</th>
<th>WAGE/SALARY</th>
<th>PAYMENT</th>
<th>COMMON BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time</td>
<td>Usually 35+</td>
<td>Steady</td>
<td>Annual</td>
<td>Weekly or bi-weekly</td>
</tr>
<tr>
<td>Part-Time</td>
<td>Usually &lt;35</td>
<td>May vary</td>
<td>Hourly</td>
<td>Weekly or bi-weekly</td>
</tr>
<tr>
<td>Temp</td>
<td>As available</td>
<td>May vary</td>
<td>Hourly</td>
<td>Weekly or bi-weekly</td>
</tr>
<tr>
<td>Self-employed aka Freelance</td>
<td>Varies</td>
<td>Varies</td>
<td>Negotiate rate of pay with client</td>
<td>Upon completion of work or on a schedule of deliverables</td>
</tr>
<tr>
<td>Union</td>
<td></td>
<td></td>
<td>Typically higher than comparable non-union positions</td>
<td>As negotiated by the union with the employer on behalf of members</td>
</tr>
</tbody>
</table>

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For information about the DOE CTE Programs:
http://schools.nyc.gov/ChoicesEnrollment/CTE/ParentsandStudents/default.htm
http://CTECouncil.org

For additional information:
http://www.aaaa.org/careers/Pages/default.aspx (advertising)
http://www.prsa.org/ (public relations)
http://www.bls.gov/ooh/media-and-communication/home.htm (broadcasting)

Where can I get additional general information on careers?
For careers in New York State: www.careerzone.ny.gov
For general career information, including videos of nearly 550 careers: www.acinet.org
## Creative Jobs

**INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED**

<table>
<thead>
<tr>
<th>Some College and/or Moderate Experience</th>
<th>College or Experience</th>
<th>College Plus Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Graphic Designer</strong></td>
<td><strong>Copy Writer</strong></td>
<td><strong>Managing Editor</strong></td>
</tr>
<tr>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
</tr>
<tr>
<td>Design or create graphics to meet clients’ needs for letterheads, logos, websites or other media.</td>
<td>Write for ads, publications, or the Internet – often to promote sales.</td>
<td>Overseen editorial staff, manage quality control, and have the final word on materials being published.</td>
</tr>
<tr>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
</tr>
<tr>
<td>$30,000 to $75,000 per year</td>
<td>$30,000 to $50,000 per year</td>
<td>$45,000 to $85,000 per year</td>
</tr>
<tr>
<td><strong>Presentation Designer</strong></td>
<td><strong>Editor</strong></td>
<td><strong>Art Director</strong></td>
</tr>
<tr>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
</tr>
<tr>
<td>Design and create presentation materials on a computer or on paper.</td>
<td>Coordinate and edit written and other material for publication.</td>
<td>Come up with design ideas and approaches and execute them in art or layout design.</td>
</tr>
<tr>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
</tr>
<tr>
<td>$40,000 to $75,000 per year</td>
<td>$40,000 to $100,000 per year</td>
<td>$73,000 to $163,000 per year</td>
</tr>
<tr>
<td><strong>Web or Mobile Media Designer</strong></td>
<td><strong>Application Developer</strong></td>
<td><strong>Creative Technologist</strong></td>
</tr>
<tr>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
</tr>
<tr>
<td>Design, create, and modify websites or mobile or tablet apps.</td>
<td>Create computer applications or utility programs. Develop software solutions to meet customers’ needs.</td>
<td>Help customers decide the best technology to communicate their message. Oversee the design and technical development of media projects.</td>
</tr>
<tr>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
</tr>
<tr>
<td>$40,000 to $75,000 per year</td>
<td>$70,000 to $120,000 per year</td>
<td>$85,000 to $185,000 per year</td>
</tr>
<tr>
<td><strong>Digitizing Technician</strong></td>
<td><strong>Digital Director</strong></td>
<td><strong>Design Director</strong></td>
</tr>
<tr>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
<td><strong>DUTIES:</strong></td>
</tr>
<tr>
<td>Take materials like books or tapes and convert them into something that can be used on computers or other digital media.</td>
<td>Build relationships with prospects, clients and partners in online marketing and media areas.</td>
<td>Overseen and direct design of print and digital media.</td>
</tr>
<tr>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
<td><strong>PAY RANGE:</strong></td>
</tr>
<tr>
<td>$40,000 to $100,000 per year or $19 to $48 per hour</td>
<td>$85,000 to $185,000 per year</td>
<td>$85,000 to $185,000 per year</td>
</tr>
</tbody>
</table>

**MAP KEY**

- Expected to grow faster than average in the next 6 years.
- Licensing or certification required.
- Pay Range: Typical pay range from entry level to experienced. Jobs that are primarily part-time are expressed as hourly pay; jobs that are primarily full-time are shown with annual pay. Those that could be either are shown both ways.
- Education: Minimum education and experience requirements. This may vary from employer to employer.

This flyer highlights some jobs, but not all jobs in this sector.
### Technical Jobs

**INCREASING LEVELS OF EDUCATION/TRAINING REQUIRED**

<table>
<thead>
<tr>
<th>Some College and/or Moderate Experience</th>
<th>College and/or Significant Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Camera Operator</strong></td>
<td><strong>Film Editor</strong></td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Run television, video, or film camera</td>
<td>Edit film, video, or other media and</td>
</tr>
<tr>
<td>for TV broadcasts, advertising, video</td>
<td>synchronize soundtracks with Images.</td>
</tr>
<tr>
<td>production, or the movies.</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>$45,000 to $85,000 per year</td>
</tr>
<tr>
<td>$30,000 to $55,000 per year or</td>
<td></td>
</tr>
<tr>
<td>$14 to $26 per hour</td>
<td></td>
</tr>
<tr>
<td><strong>Sound Engineering Technician</strong></td>
<td><strong>Technical Director</strong></td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Set up and connect audio equipment</td>
<td>Coordinate taping, editing,</td>
</tr>
<tr>
<td>including microphones, sound speakers,</td>
<td>engineering, and maintenance</td>
</tr>
<tr>
<td>recording equipment, and mixing boards.</td>
<td>departments to produce radio or</td>
</tr>
<tr>
<td></td>
<td>television programs.</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>$35,000 to $75,000 per year or</td>
<td>$45,000 to $85,000 per year</td>
</tr>
<tr>
<td>$17 to $36 per hour</td>
<td></td>
</tr>
<tr>
<td><strong>Video Technician</strong></td>
<td><strong>Director</strong></td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Set up video equipment including video</td>
<td>Direct television, radio, video,</td>
</tr>
<tr>
<td>screens, projectors, monitors,</td>
<td>or film productions, make creative</td>
</tr>
<tr>
<td>connect wires and cables.</td>
<td>decisions about scripts, actors,</td>
</tr>
<tr>
<td></td>
<td>design and sound.</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>$35,000 to $70,000 per year or</td>
<td>$55,000 to $150,000 per year</td>
</tr>
<tr>
<td>$18 to $34 per hour</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical Technician</strong></td>
<td><strong>Chief Engineer</strong></td>
</tr>
<tr>
<td>DUTIES:</td>
<td>DUTIES:</td>
</tr>
<tr>
<td>Apply electrical knowledge to design,</td>
<td>Oversee the technology needed to</td>
</tr>
<tr>
<td>build, repair, and adjust electrical</td>
<td>put a broadcast on-the-air. Make</td>
</tr>
<tr>
<td>components, circuitry and controls.</td>
<td>sure equipment is ready for broadcast</td>
</tr>
<tr>
<td></td>
<td>and solve problems when they</td>
</tr>
<tr>
<td>PAY RANGE:</td>
<td>arise.</td>
</tr>
<tr>
<td>$40,000 to $77,000 per year or</td>
<td>PAY RANGE:</td>
</tr>
<tr>
<td>$24 to $37 per hour</td>
<td>$95,000 to $175,000 per year</td>
</tr>
</tbody>
</table>

---

**Did you know?**

- It can be hard to get your “foot in the door” in the industry.
- Qualified people often take lower level jobs just to break into the industry.
- If you want a job with a well-known company, it is a good idea to get an internship first.
- In creative jobs, experience and talent may count more than education.
- It is a fast-changing industry where knowing how to learn new things is key.
- Jobs in the industry often require excellent communication skills.
- There are salaried jobs and freelance opportunities in this industry.
# Administration and Sales Jobs

## Increasing Levels of Education/Training Required

<table>
<thead>
<tr>
<th>High School and Some Experience</th>
<th>College or Experience</th>
<th>College Plus Experience/Certification and/or Postgraduate Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative Assistant</strong></td>
<td><strong>Ad Account Executive</strong></td>
<td><strong>Certified Public Accountants</strong></td>
</tr>
<tr>
<td><strong>DUTIES:</strong> Support executives and managers in media and advertising firms. Screen calls and take messages. Coordinate travel arrangements, compile and maintain news clips and media lists, do Internet research, organize office and maintain files, draft letters and newsletters, and schedule appointments.</td>
<td><strong>DUTIES:</strong> Sell advertising space or time in publications, or on signs, TV, radio, or the Internet. Develop and maintain client relationships and close sales. Do product demonstrations in person, or by phone or webinar.</td>
<td><strong>DUTIES:</strong> Keep track of the financial well being of a media or advertising firm. For example, may calculate assets, profits and losses and tax liability.</td>
</tr>
<tr>
<td><strong>PAY RANGE:</strong> $26,000 to $44,000 per year or $12 to $22 per hour</td>
<td><strong>PAY RANGE:</strong> $40,000 to $90,000 per year</td>
<td><strong>PAY RANGE:</strong> $55,000 to $100,000 per year</td>
</tr>
<tr>
<td><strong>Bookkeeper</strong></td>
<td><strong>Talent Development Specialist</strong></td>
<td><strong>VP Market Research</strong></td>
</tr>
<tr>
<td><strong>DUTIES:</strong> Take care of accounting work for a media, advertising or public relations firm. Do the day to day work on accounts payable and receivable, prepare invoices and pay bills. Bookkeepers often work part-time and have flexible hours.</td>
<td><strong>DUTIES:</strong> Recruit, screen, interview, and hire workers into available positions. May do staff training or college recruitment for the industry. This work requires an eye for the unique skills needed in the broadcast or advertising industries.</td>
<td><strong>DUTIES:</strong> Oversee media research. Communicate with clients to understand their needs. Develop methods, design and direct research and make recommendations based on findings. Research could be about market activity, competitors’ performance, customer preferences, or future trends that could affect clients’ business.</td>
</tr>
<tr>
<td><strong>PAY RANGE:</strong> $30,000 to $45,000 per year or $14 to $22 per hour</td>
<td><strong>PAY RANGE:</strong> $40,000 to $85,000 per year</td>
<td><strong>PAY RANGE:</strong> $100,000 per year and higher</td>
</tr>
<tr>
<td></td>
<td><strong>Media Market Research Analyst</strong></td>
<td><strong>VP Sales and Marketing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>DUTIES:</strong> Research market conditions or collect information to get a sense of the sales potential of a product or service. Do research on competing firms’ prices, and sales and marketing methods.</td>
<td><strong>DUTIES:</strong> Manage ad account executives by setting territories and sales quotas. Build new business opportunities and generate revenue for newspapers, television programs, and/or websites. Make sure that clients’ needs are being met.</td>
</tr>
<tr>
<td></td>
<td><strong>PAY RANGE:</strong> $85,000 to $185,000 per year</td>
<td><strong>PAY RANGE:</strong> $100,000 per year and higher</td>
</tr>
<tr>
<td></td>
<td><strong>Talent Development Manager</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>DUTIES:</strong> Plan, direct, or coordinate human resources activities and staff of an advertising or public relations firm. Talent development work requires an understanding of and eye for the unique skills needed in the broadcast or advertising industries.</td>
<td></td>
</tr>
</tbody>
</table>
Technology is everywhere and so are tech jobs. With virtually everyone using computers, smartphones, tablets and other devices, there is more and more demand for people to answer user questions and make sure that everything is operating smoothly.

**WHAT IS TECH SUPPORT?**
Tech support staff help computer users.
- The job might be called Help Desk Technician, Desktop Support Specialist, or IT Specialist.
- Tech support staff set up and take care of computers, scanners, printers and other devices.
- They install software, troubleshoot problems with email, software or lost files, and make sure servers and networks are working the way they are supposed to.
- They keep track of everything they do so that they can build on what they have learned before.

**WHERE DO TECH SUPPORT PEOPLE WORK?**
- Tech support people work for every type of employer.
- The top industries are computer companies, colleges and universities, and elementary and secondary schools.
- Corporate headquarters, government offices, legal services, non-profit organizations, and health care providers all hire tech support professionals.

**WHO LIKES TO WORK IN TECH SUPPORT?**
People who enjoy this work:
- Like working with technology and helping people.
- Are good at figuring out what the computer user is saying, calming him or her down, and communicating in non-technical language.
- Have patience and are positive and reassuring.
- Enjoy solving problems and can think out-of-the-box.
- Can document every step they take to solve the problem.

**WHAT KIND OF PAY AND HOURS ARE INVOLVED IN THIS TYPE OF WORK?**
- Most tech support people have full-time work schedules.
- While some facilities might offer 24/7 tech support, most employers offer support to computer users during the standard work day, typically 8 AM – 6 PM.
- In New York City in 2015, an entry-level tech support person earned approximately $38,150.
- Pay increases with experience, education, and moving to higher level jobs on the career path.

**HOW CAN I PREPARE TO WORK IN TECH SUPPORT?**
- Entry level jobs in tech support require at least a high school diploma or equivalent and employers prefer an industry-recognized certification such as CompTIA’s A+.
- Many employers prefer an associate degree.
- In addition to technical skills, employers are looking for good customer support and helping skills.
- Advancing to higher level positions in tech support usually requires an associate degree or a bachelor’s degree.
- The typical major for tech support people is Computer Information Systems.

**WHAT DOES THE FUTURE LOOK LIKE FOR TECH SUPPORT?**
- Between 2012 and 2022, these jobs are projected to grow by 22 percent.
- There are thousands of online job advertisements for tech support positions every year.
WHAT DOES A CAREER IN TECH SUPPORT LOOK LIKE?

Jobs in tech support vary by the type of job and from employer to employer. Usually, the Help Desk function is tended, with people at higher tiers handling more complicated problems. With more experience, education, and certifications, tech support professionals can move from entry-level roles such as Help Desk Tier 1, Desktop Support or IT Specialist to other jobs on this career map.

This career map is based on the real experiences of actual people. The information comes from real online work histories of people who have worked in tech support in the New York City Metropolitan Area. PayScale, Inc. and Monster Government Solutions supplied this data.

NETWORK AND COMPUTER SYSTEMS ADMINISTRATOR

Computer network administrators manage the day-to-day operation of those networks. They make sure that email and data storage networks work properly. They help make decisions about buying new hardware and software for their organization's network. People who work in these jobs are also critical part of almost every organization. Popular certifications include: Network+, CCNA, and MCSE.

PROJECT MANAGER

There are many types of project managers. Some plan and manage IT projects like network design, while others may oversee software projects. They serve as a liaison between business and technical aspects of projects. They make sure that deadlines, standards, and cost targets are met. The most popular certification for this job is Project Management Professional (PMP).

COMPUTER SYSTEMS ANALYST

People in these jobs plan, direct or coordinate activities in technology fields. They help determine the IT goals of an organization and are responsible for implementing computer systems to meet these goals. People in these jobs often work more than 40 hours per week and are "on call" in case of IT emergencies.

COMPUTER AND INFORMATION SYSTEM MANAGER

People in these jobs plan, direct or coordinate activities in technology fields. They help determine the IT goals of an organization and are responsible for implementing computer systems to meet these goals. People in these jobs often work more than 40 hours per week and are "on call" in case of IT emergencies.
WHAT ARE SOME OTHER TYPES OF CAREERS IN TECH?

In addition to jobs in tech support, there are many other types of tech jobs. Most of these jobs have to do with creating and managing software, which may also be known as computer programming. Here are some of the major types of software jobs:

**WEB DEVELOPMENT**

Web development brings together the programming skills and communication skills needed to design appealing applications for consumers. There are many functions in web development. Depending on the company, people can carry out some or all of them. For example, some jobs in this field involve designing websites, and others involve developing content. There are jobs for people who monitor a website's performance, such as its speed and traffic. Some people specialize in making sure that the website makes sense and is appealing. Other people program the “back-end,” like the databases that run in the background of sites like Amazon or Facebook. Typical education: Bachelor’s degree. Typical major: Computer Science or Web Development.

**SOFTWARE DEVELOPMENT**

Software includes operating systems like Windows, office applications like Excel, mobile “apps” and games. People who work in these jobs are the creative minds behind the computer programs. Some jobs focus on making sure the customers get what they want. Other jobs involve writing the programs that make the software run. People in this field usually know more than one programming language. While certain programming skills, such as JavaScript, Microsoft C#, Java, and C++ are in high demand, different industries demand different software skills. Typical education: Bachelor’s degree. Typical major: Computer Science.

**DATABASE MANAGEMENT**

Database managers or administrators use specialized software to collect, store, organize, and analyze data, such as financial information, customer shipping records, or student data. They make sure that data are well-documented, available to users, and secure from unauthorized access. Typical education: Bachelor’s degree. Typical major: Computer Science or Data Science.

**CYBERSECURITY**

People who work in this field carry out security measures to protect computer networks, systems, and the information they hold. Their responsibilities are continually expanding as the number of cyberattacks increases. Cybersecurity jobs are in demand and growing across the economy. The fastest increases in demand are in industries that manage volumes of consumer data, such as Finance, Health Care and Retail Trade. Online job postings for cybersecurity have grown three times as fast as openings for IT jobs overall. Cybersecurity positions are more likely to require certifications than other IT jobs. Some also require a government security clearance. Typical education: Bachelor’s degree and at least three years’ experience and/or Masters of Business Administration (MBA) in Information Systems. Typical major: Computer Science.

FOR MORE INFORMATION

If you would like to request more career maps, please contact the Center for Economic & Workforce Development at Kingsborough Community College at cewd@kbcc.cuny.edu or (718) 368-4637.

If you would like to learn more about the research methodology or to create a map that focuses on a different occupation or field, please email NYCLMIS at nyclmis@gc.cuny.edu or (212) 817-2031.
### WHAT PROGRAMS AT CUNY PREPARE PEOPLE FOR THE JOBS ON THIS CAREER MAP?

<table>
<thead>
<tr>
<th>CERTIFICATIONS</th>
<th>ASSOCIATE DEGREE</th>
<th>BACHELOR’S DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMPTIA</strong></td>
<td><strong>CISCO</strong></td>
<td><strong>OTHER</strong></td>
</tr>
<tr>
<td><strong>CIS = COMPUTER INFORMATION SYSTEMS</strong></td>
<td><strong>A+</strong></td>
<td><strong>NETWORK</strong></td>
</tr>
<tr>
<td><strong>CS = COMPUTER SCIENCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IT = INFORMATION TECHNOLOGY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BARUCH COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BOROUGH OF MANHATTAN COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GUTTMAN COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HUNTER COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>JOHN JAY COLLEGE OF CRIMINAL JUSTICE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SCHOOL OF PROFESSIONAL STUDIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>THE CITY COLLEGE OF NEW YORK</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BRONX COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HOSTOS COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LEHMAN COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LAGUARDIA COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>QUEENS COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>QUEENSBOROUGH COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>YORK COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BROOKLYN COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>KINGSBOROUGH COMMUNITY COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MEDGAR EVERS COLLEGE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NEW YORK CITY COLLEGE OF TECHNOLOGY</strong></td>
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<td><strong>COLLEGE OF STATEN ISLAND</strong></td>
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</table>

*12-credit certification program in Computer Information Systems

**NOTE:** THIS TABLE IS ACCURATE FOR THE 2015-2016 ACADEMIC YEAR. CUNY SCHOOLS CONTINUALLY UPDATE THEIR DEGREE AND CERTIFICATE OFFERINGS. PLEASE CONSULT EACH SCHOOL’S WEBSITE FOR THE MOST CURRENT OFFERINGS.

### TECH SUPPORT CERTIFICATIONS

**COMPTIA** ([www.comptia.org](http://www.comptia.org)) is a non-profit trade association that provides vendor-neutral professional certifications for the information technology (IT) industry. These are the certifications most requested by employers in online job ads:

- **CompTIA A+** tests competence as a computer technician. It includes many technologies and operating systems from such companies as Microsoft, Apple, Novell and Linux. In order to receive this certification, a candidate must pass two exams. It is intended for IT professionals with 500 hours of hands-on experience.

- **CompTIA Network+** measures skill as a network technician, understanding of network hardware, installation and troubleshooting. CompTIA recommends having the A+ certification and nine months of networking experience before taking the exam, but this is not required.

**CompTIA Security+** deals with computer security topics such as cryptography, access control, disaster recovery and risk management. It is recommended that candidates have two years of security-related work experience before sitting for this exam.

**Cisco Systems, Inc.** ([www.cisco.com](http://www.cisco.com)) designs, manufactures, and sells networking equipment. It is the largest networking company in the world. The company sponsors certifications at different levels for Cisco products. The certifications most commonly mentioned in online job ads are:

- **Cisco Certified Entry Networking Technician (CCENT).** This certification was introduced relatively recently and validates skills required for entry-level network support jobs.

- **Cisco Certified Network Associate (CCNA).** The basic CCNA certification focuses on routing and switching, and covers skills necessary for small or medium-sized networks. Cisco offers other, more specialized CCNA certifications related to specific job roles and technologies.

**Cisco Certified Network Professional (CCNP).** This certification recognizes more advanced networking knowledge and skills. Like the CCNA, there are a variety of CCNP certifications that relate to different roles and job titles. A valid CCNA certification is required to obtain a CCNP certification.

**Microsoft** ([www.microsoft.com/en-us/learning/default.aspx](http://www.microsoft.com/en-us/learning/default.aspx)), offers certifications that can help a Windows Server administrator demonstrate expertise. These include the Microsoft Certified Professional (MCP), the Microsoft Certified Solutions Associate (MCSA) and the Microsoft Certified Solutions Expert (MCSE).

These organizations often update their certification options, so it is important to check with them before preparing for or deciding on a certification.
## Careers in Technology

Use the information in the brochure to infer what skills and qualities are necessary for each career. Then try to come up with as many kinds of businesses as possible that would employ someone in this career. Finally, develop two questions you have about this career that weren’t answered in the brochure.

<table>
<thead>
<tr>
<th>Career</th>
<th>Skills necessary for this career</th>
<th>Characteristics necessary for this career</th>
<th>What education or training does this career require?</th>
<th>What kinds of businesses employ people in this career?</th>
<th>Two questions I have about this career 1.</th>
<th>Two questions I have about this career 2.</th>
</tr>
</thead>
</table>
Denise’s Technology Career
Movement Story

Students read a story about Denise, a technology worker who went back to school and changed jobs multiple times to find a career in Technology that was a good fit for her.

PREP
Read Denise’s Story: “Technology was the key to my career change.”

Be prepared to explain vocabulary: proficient, versatile and alumni.

MATERIALS
Denise’s Story: “Technology was the key to my career change.”

EXPLAIN

1. Denise’s Story: “Technology was the key to my career change,” is the story of a worker who was passionate about and skilled in technology, but changed jobs several times before finding a career she was happy with.
   
   Ask: Even if you aren’t interested in a career in IT, how could an article about a worker moving between various jobs be useful to you?
   
   I might want to make a career change now or in the future. It could be useful to learn about what the steps someone took to move from job to job.

2. Distribute Denise’s Story: “Technology was the key to my career change” and ask students to read it. When they have finished, write the following questions on the board and ask students to discuss them in pairs:

   - Why didn’t Denise like her customer service job? What kind of job did she get later, and how was it different?
   - How did Denise feel about going back to school and changing jobs when she realized she didn’t like her first job? Why?
   - What does Denise mean by “soft skills”? Can you give an example?
   - Why didn’t Denise like her job as a help desk technician?
   - How did Denise end up finding her job as an IT field specialist?
   - Denise’s first and second jobs were not the right job for her. What factors, other than salary, would make a job right for you?
Denise’s Story: “Technology was the key to my career change.”

It is no secret that technology jobs are everywhere. These days there are technology jobs in nearly every workplace imaginable. Pursuing training in technology skills can make a lot of sense for people thinking about pursuing a career for the first time or making a career change. Technology education can open doors of opportunity practically anywhere you want to go. Perhaps you won’t be surprised to learn then, that technology was the key to my career change.

Finding my passion
I am a 26-year-old single mom with a high school equivalency diploma who worked in customer service for many years. I started working long before I left high school. Since I was the oldest of six kids growing up, I had to work to help out my family and, as a result, I fell behind in my studies and eventually quit school. I started out working as a cashier in a department store. After I left high school, I worked my way up to becoming a supervisor. Along the way, I developed various technology skills because cashiers were required to use the computer systems to ring up customer purchases. In addition, we were required to become proficient in the computer programs that kept track of our inventory, employee schedules, clocking in and out of shifts, and making sure the store’s money and private information were kept safe. Most people don’t think about how much technology is necessary to keep a retail store running—I know I didn’t before I worked at one! Being promoted to supervisor of my department was great because I made more money, had more responsibility, and as a result, continued to gain more technology and people skills. I was able to move out of my parents’ place and get an apartment with some friends, all the while still giving my parents money to help out with my brothers and sisters. I felt like I had finally started my own life, but I wasn’t truly happy with my career. I liked helping people, but I didn’t like selling them things and I didn’t like being responsible for making sure other employees did what they were supposed to do. I knew it was time for a change. But to what?

I’ve always loved computers ever since I was little and my mother taught me how to use the computer at the public library to find the science fiction books I loved to read. I thought it was so cool how all the names and information about all the books in every library in all of New York City lived inside one little computer and I could find out about anything I wanted with the click of a mouse. Computers just always seemed to come naturally to me and sometimes one of the computers at the department store wouldn’t work right or the wifi would go down, and I would figure out how to fix it so we wouldn’t have to call in the computer support.
specialists. I really started to love the process of fixing technology problems and my co-workers and even my bosses began to rely on me when technology needed simple troubleshooting. Of course, I wasn't always able to figure out the problem and sometimes we would have to call in the specialists.

One day at work, a computer systems support specialist came in to resolve an issue for us and I got to talking with her while I was on my lunch break. I asked her about how she became a support specialist and she told me that she had gotten an associate’s degree from New York City College of Technology in Computer Information Systems and encouraged me to go online and check it out. She also said that the company she worked for often paid for her to take classes to get certified in new technology because technology changes so fast these days, there’s always something new you have to learn. Plus, she said, you already have work experience since you’re trained on all the systems here.

I realized she was right and for the first time, I felt really excited thinking about what I might be able to do with my career. As soon as I got out of work, I went straight to the library and researched the City Tech program online. I found out that the Associate’s degree in Computer Information Systems prepared students for all kinds of entry level technology careers in computer programming, database programming, web programming, and systems/network administration and support. This sounded great because I didn't know exactly what I wanted my career to be—I just knew that I felt excited and passionate about computers. Even though I felt excited about the idea of going to college, I was afraid that I wouldn’t get accepted because, let’s face it, I didn’t even pass high school math—did people like me really belong in technology careers? I figured there was only one way to find out. So I applied. And I got in! I had to apply for financial aid and figure out childcare for the evenings when I had class after work, but I decided going back to school was the next step I wanted to take.

I kept working in my supervisory position at the department store for the next two years while attending City Tech. All the while, I kept getting more hands-on experience with technology at work and doing research about technology careers online in my spare time. It was hard to go to school and work full time—I had to ask friends and family to pitch in more with taking care of my daughter and I would often have to stay up most of the night after she went to bed to do my homework—but I just kept reminding myself that it would only be like this for two years and that it would improve our lives in the long run.

I graduated with an Associate’s degree in Computer Information Systems from City Tech and within a couple of months, I was able to find a job as a help desk technician with a company called TechnoBuddy. My job was to help our clients online and over the phone who were having technical problems with the
hardware or software at their small businesses. It was thrilling finally getting to apply all the new skills I’d learned in school. I spoke the language of technology now and felt confident in my ability to troubleshoot complex problems across a range of computer platforms and systems. Due to my previous career in customer service, I was a pro at what are known as the “soft skills” of the job—getting along with clients even when they’re in a bad mood because their systems are down and it’s messing up their whole work day; treating people with kindness, humor and respect while helping them resolve complicated issues; and having great communication skills so that even when I am explaining complex technical issues to our clients, they can understand what I’m saying and we can solve their problems together. However, all this aside, I quickly realized that being a help desk technician at TechnoBuddy was not the right job for me. I didn’t like the long hours at a desk, on the phone or staring at a computer screen. I loved helping people and I loved working with technology, but I hated being stuck in an office all day. I wanted to get my hands dirty! And I wanted to be able to interact with people face-to-face.

**It’s what you know and who you know**

I knew that my education was versatile and could be applied to many different kinds of careers. I just had to find one that was right for me. I was nervous about what it would be like to change careers. I wondered if it would feel like I was having to start all over again from the beginning. Then I remembered that our professors at City Tech always told us to expect new tech careers to require different additional training and certifications. But that once we had the foundational knowledge of technology language and processes, working with different programs, systems, and devices would come naturally (or at least easier!) to us and this would be an important quality employers across sectors would be looking for. I searched for jobs online and spoke with everyone in my network I could think of—friends, family, former co-workers, classmates—to put the word out that I was looking for something new. One of my former classmates suggested that I go to a networking event City Tech was hosting for alumni. At the event, I met other all sorts of other tech professionals—IT specialists, health information technicians, recording technicians who worked in the music industry - who had all graduated from the City Tech program. To my surprise, they wanted to know what I was doing, what career I was interested in pursuing, and how we might be able to connect each other to resources the other one didn’t have. I was so excited to learn there was a whole group of smart, professional people who wanted to get to know me and help me out just because we graduated from the same school.

As it turns out, a guy I met at the alumni event worked for a major national transportation company who was hiring IT field specialists. He said the field...
specialists got to travel to different places every day and actually do the hands-on work of troubleshooting hardware and software in person, wherever the company was having an issue. He was an IT manager at the company and said he was more than happy to put in a good word for me if I wanted to submit my resume. And he really came through for me. About 24 hours after submitting my resume online to the company, I got a phone call inviting me in for an interview! I couldn’t believe it. I’d always heard people say, “It’s not what you know, it’s who you know.” Now I knew they really weren’t kidding! But of course, it’s also what you know. My fellow City Tech alumni helped get my foot in the door, but it was my skills, training, previous experience, people skills, passion and professionalism that got me my current job as an IT field specialist.

On any given day, I get to travel to our company’s locations all over the Greater New York City area and help keep things running smoothly. I meet new people and get to work on solving different issues all the time. Every day is a new day and I am responsible for everything from providing hardware and software technical support to training new employees on how to use our operating systems and business application software. Investigating and resolving software and hardware problems for my colleagues is probably my favorite part of the job. Whenever I am out on a job, sometimes in a place I’ve never been to before and perhaps would never have experienced if it wasn’t for my career, I am reminded of the systems support specialist that came to the department store that day when I was contemplating making a career change and inspired me to follow what I was passionate about. She was right when she said the education I received in school would build upon the skills and work experience I already had, and because technology workers are necessary everywhere in today’s job market, I was able to change my career, not only once, but twice, allowing me to find what I was really meant to do. Who knows? Maybe I’ll decide I want to do something new again 5, 10 or 20 years from now. Technology careers require that you stay up to date on current trends, always learning and growing, so I’ll be ready when the time comes. Technology isn’t going anywhere and the opportunities are only going to keep getting bigger!
Denise’s Career Map

Drawing on their experiences with map-reading, students consider the trajectory Denise took and portray it as a map. They identify the steps she took to move from one job to another.

PREP

• Be prepared to define the terms: key, legend, symbol, feature.
• Draw a Career Map based on Denise’s story that you can reference when working with students.

MATERIALS

• Chart paper and markers
• Teacher’s map of Denise’s Career Changes

DISCUSSION

Ask: What is a map?

› A visual representation of a geographic location.

How is it used?

› For navigation. To learn how to travel between points, or how to find where you are, if you’re lost.

Some maps have a key or legend. What does a key on a map usually tell you?

› It includes symbols that correspond to various types of landmarks on the map such as medical facilities and religious buildings.

Why is this important?

› It locates the landmark and identifies its purpose.

Have you ever used a NYC* subway map? What are some of the features and symbols on it and what do they represent?

› Example: Different colored lines, representing subway lines, squares for terminal stations, open circles and closed circles for express and local stops, dotted lines for subway tracks currently under construction.

Have you ever used another kind of map? What kind? What was easy or difficult about using it? What are some symbols you might find on a map?

› Straight lines, dotted lines, triangles, circles icons, for example of mountains or restaurants.

VOCABULARY

key
legend
symbol
feature
Draw Denise’s Career Map

Divide students into groups to draw Denise’s career map. Distribute the paper and markers to each group.

DISCUSS INSTRUCTIONS

1. Take out one piece of loose leaf paper for the group. Before you draw the map, list Denise’s jobs in order. Next to each job, list anything Denise did to help her move forward in her career.

   Example: Talking to others who work in the field or attending networking events.

2. On a separate piece of paper, draw a map as follows:
   - Write the jobs and draw a circle around each job.
   - Write the steps Denise took to get each job or next point on her career path and draw a box around each step.
   - Draw dotted lines connecting the jobs and steps showing an order of progression.

3. Draw a legend or key, explaining what the circles, boxes and dotted lines mean.

![Career Map Diagram](example map)

KEY:
- Step
- Job
Technology Job Training Series

Students learn about job training programs—what they are, how to find a good one, and what to expect as a participant. They then develop questions and conduct research on high-quality training programs for Technology careers.

ACTIVITIES IN THIS SERIES

4.1 • Job-Seeker Terminology

4.2 • Know Before You Enroll

4.3 • Developing Questions: Researching Job Training Programs in Technology
Job-Seeker Terminology

Students learn vocabulary relevant to a job search in any sector, by matching job search terms to their definitions.

PREP

- Create one index card for each student, containing either a type of Job-Seeker term or a description of the term. It’s okay if some of them repeat.

EXPLAIN

1. Explain that there are lots of programs that help people find jobs and help employers fill positions, and lots of differences between them.

2. Distribute one card to each student, making sure each card has a match, and ask students to find their match.

3. Once students find their match, have pairs share their description with the class.

4. Discuss definitions as a class.
## Job-Seeker Terminology Definition of Job-Seeker Terminology

<table>
<thead>
<tr>
<th>Job-Seeker Terminology</th>
<th>Definition of Job-Seeker Terminology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job Training</strong></td>
<td>A program, either fee-based or free, in which participants learn a specific workplace skill, such as refrigerator repair or commercial driving. May include job search assistance.</td>
</tr>
<tr>
<td><strong>Job Placement</strong></td>
<td>A service that assists participants in applying for jobs. It may be part of a job training program or may exist on its own.</td>
</tr>
<tr>
<td><strong>Job Readiness</strong></td>
<td>Teaches general workplace skills such as professional dress and communication, how to write a resume and cover letter, how to prepare for an interview, and workplace expectations such as punctuality and cell phone use.</td>
</tr>
<tr>
<td><strong>Career Advisement/Coaching</strong></td>
<td>One-on-one meetings to discuss a job-seeker’s interests and skills, where to look for jobs and educational opportunities.</td>
</tr>
<tr>
<td><strong>Employment Agency or Office</strong></td>
<td>A company, hired by businesses, to interview and hire new employees, and used by job-seekers to find jobs.</td>
</tr>
<tr>
<td><strong>Degree</strong></td>
<td>A document earned from a college or university showing completion of coursework in a particular area of study. Usually requires a minimum of 2-3 years.</td>
</tr>
<tr>
<td><strong>Certificate</strong></td>
<td>A document earned from a college or university, community based organization, union or private company, showing mastery of a specific job-related skill.</td>
</tr>
<tr>
<td><strong>Apprenticeship</strong></td>
<td>“Earn while you learn.” This is paid training in a particular job-related skill, often including classroom and work experience hours. Participants are sometimes hired by the company that trained them and sometimes receive job placement assistance. They are common in the building trades and more recently in the culinary arts.</td>
</tr>
<tr>
<td><strong>Pre-Apprenticeship</strong></td>
<td>A program that provides participants with the skills they need to participate in a paid training program, such as literacy and math skills related to the job.</td>
</tr>
<tr>
<td><strong>Internship/Field Placement/Practicum</strong></td>
<td>Supervised work experience and workplace-based training often done for school or college credit. It may be accompanied by or part of a class in which training experiences are discussed.</td>
</tr>
<tr>
<td><strong>Trainee</strong></td>
<td>A person who is being trained in a particular job. Most trainees are paid for their training.</td>
</tr>
<tr>
<td><strong>Probation</strong></td>
<td>A period early in employment during which an employee must demonstrate her competency at her job before being considered a permanent employee.</td>
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</table>
Know Before You Enroll*

Students learn how to choose a high quality job training program by reading a training program selection tip sheet and using it to write a letter of advice to a young person in their life who is planning to enroll in a job training program.

PREP

- This activity may be done following the previous activity on researching local job training programs, or may be done on its own.
- Read the Know Before You Enroll tip sheet.

MATERIALS

- Know Before You Enroll tip sheet
- Job Training Advice Letter writing assignment

EXPLAIN

1. The New York City Mayor’s Office discovered that many students were graduating from job training programs with a lot of debt and without jobs or useful certifications promised by the programs. They created an ad campaign to help New Yorkers choose high quality training programs that would help them be prepared for and find employment in their field. Although it was created in New York City, much of the advice applies to job training programs anywhere.

2. Distribute the Know Before You Enroll tip sheet, and ask students to read and annotate it. In particular, they should underline and take notes about:

   - Any tips in the handout that seem like good ideas, or ones that they hadn’t thought about before.
   - Anything that is confusing to them.

3. Have students share their ideas from the handout in small groups.

   Which were the best ideas from the handout, and why? What questions did you have or which parts, if any, seemed confusing?
4 Tell students that they will now use what they learned for a writing assignment. It's often good to look back at a reading to check what it says, but it's also good to turn it over and not look at it, to challenge your memory of what it said, and to make sure you're writing about it in your own words. Tell students to put away their handout to write.

5 Distribute the writing assignment and review the directions.

6 Before they write, ask students to discuss in pairs the best pieces of advice from the reading (without looking at the reading).

7 Once students have written the letters, ask them to re-read the tip sheet and mark any points they remembered incorrectly, or any useful points they did not include. Then revise their letters to include these points, putting all information in their own words.
Know Before You Enroll Tip Sheet

THE ISSUE

As the number of enrollees in job training programs grows, there is concern about these schools’ high cost and aggressive marketing. For-profit schools widely market their services on subways and buses, TV and radio, and in community and ethnic newspapers, but many students are unaware of the potential implications of enrolling in a for-profit school or of the free and low-cost education and training programs that are available.

I saw an ad on TV for a two-year school where I could learn graphic design and threw away $25,000 on a worthless diploma. My credits don’t transfer toward a bachelor’s degree, and the school never helped me get the internships and jobs they promised.

Thanks to the City’s Financial Empowerment Centers, I’m paying back my loans and saving to go to CUNY.

— Garvin, Brooklyn

Visit nyc.gov or call 311 and ask about free and low-cost education and training options and financial counseling.

Know Before You Enroll

Before you take on debt or pay to enroll in a school or training program, do your homework first. Here are 10 important tips to help you protect your money.

1. **Free and low-cost adult education and training options are available.** Visit nyc.gov or call 311 and ask about free and low-cost adult education and job training options. You can attend classes at the Department of Education, City University of New York (CUNY), public libraries, community-based organizations, Workforce1 Career Centers, and more.

2. **If a school or training program sounds too good to be true, it probably is.**

3. **Research, research, research.** Consider multiple schools before deciding which one is right for you. Ask for information on graduation and completion rates, student loan debt, and whether or not the credits you get will transfer to other schools. Sit in on a class, ask to speak to former students who have completed the program, and visit nyc.gov to read reviews from real students in the NYC Training Guide. Ask to see a list of employers that hire graduates, and call those businesses to ask their opinion of the school. You should also research the general field you’re interested in to make sure it’s the right fit and there’s potential for job availability and growth.

4. **Avoid unlicensed schools.** Some schools are operating illegally. If you go to an unlicensed school, you can’t take exams to become licensed in many fields such as nursing. Visit nyc.gov or call the New York State Education Department at (212) 643-4700 or (818) 474-3800 to check if a vocational or trade school is licensed. Remember, even if a school has a license, it might not be well run, so research the school before you sign up. Call 311 or visit nyc.gov to file a complaint about an unlicensed school.

5. **Don’t sign up the day you visit a school.** Before you sign up, you need to understand how much the program will cost and how you will pay for it. Do not make such an important decision on the spot! Take your time, and research the school. Visit nyc.gov for the NYC Training Guide to learn more about specific schools and programs.

6. **Never sign anything you don’t understand.** If a school pressures you to sign a contract or agreement on the spot, walk away. You have the right to bring home important forms so you can read them more carefully and review them with people you trust.

7. **Ask for the school’s tuition cancellation policy in writing.** The policy should describe how you can get a refund if you need to cancel or withdraw. However, once you have signed up, it can be tough to get your money back.

8. **Be careful of taking on a lot of debt.** Some schools charge tens of thousands of dollars. Often, the “financial aid” that is available isn’t free money, but rather loans you have to pay back—with interest. School loans last a long time, and there’s a limit on how much money you can borrow. Loans can also lower your credit score if you don’t pay them back on time. Make sure you understand the terms and will be able to make the payments. Remember that free and low-cost education and training options are available. See tip #1.

9. **Avoid schools that “guarantee employment” after you graduate.** A school can’t guarantee that you’ll get a job when you graduate. Many times, the schools that make these types of promises don’t actually place you in a job.

10. **You have the right to file a complaint.** Did you enroll in a school or training program but didn’t get what you were promised? Call 311 or visit nyc.gov to file a complaint.

Are you in debt from school? Visit nyc.gov or call 311 and ask for an NYC Financial Empowerment Center, where you can get free one-on-one professional financial counseling.
Job Training Advice Letter

Imagine that your nephew/cousin/friend is planning to enroll in a job training program. Write a letter of advice, explaining what they should do to make sure they choose a high quality program that will help them meet their career goals. In your letter, make sure to use and explain the best pieces of advice you learned from the reading. The letter is started for you below.

Dear ___________________,

I heard that you were planning to enroll in ____________________________. I’m excited for you, and

I also wanted to offer some advice before you enroll. __________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

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Developing Questions: Researching Job Training Programs in Technology*

Students learn about local* training programs available for entry-level technology jobs by developing research questions to find out more about the programs, then researching training websites and discussing their findings.

PREP

• This activity references the previous lesson, Know Before You Enroll. It is recommended that all lessons in the series be done sequentially. If you have not done the previous lesson, you may want to incorporate the Know Before You Enroll tip sheet into this lesson.

MATERIALS

• Computers are recommended for this activity. If not available, use the job training websites listed in the directions below and print out program information to distribute paper copies to students.
• Developing Research Questions for Job Training Programs worksheet
• Technology Training Program Research worksheet

EXPLAIN

1 One option for preparing to enter the Technology workforce is a job training program. Why would someone want to do a job training program instead of going to college?

   It might be less expensive than college, not as much time is required, it prepares participants for a specific job that requires only a short-term training program.

2 Tell students that today they will research job training programs, including ones for cable installation*, web development* and computer programming*. Before they read about those programs, they are going to brainstorm questions that they might ask when investigating them.

3 Divide the students into groups. Ask groups to brainstorm questions they might ask a job training program. They may want to recall some of the job training tips from the previous activity as they develop their questions.
Once the brainstorms are complete, have students share their lists of questions with the class. Take notes on the board to create a master list of questions, and add questions they may not have thought about.

Some key questions include:

- What are the program requirements?
- How long is the training program? What is the schedule?
- What will I learn in the training?
- What kinds of jobs does the training prepare people for?
- How much (if anything) does the training program cost? Is there any financial aid available?
- What does the program do to help graduates find jobs?
- What are the job placement rates for graduates?

Distribute the Developing Research Questions for Job Training Programs worksheet, and have students write 6 questions from their brainstorm or others they think of that they want answered when they research job training programs.

Distribute the Technology Training Programs Research worksheet and let students choose from the following training websites to research a training program. Write the URLs on the board.

- Brooklyn Networks cable installation training at Brooklyn Workforce Innovations*:
  http://bwiny.org/pages/programs/brooklynnetworksa.html
- NPower/Technology Service Corps*:
- NYC Tech Talent Pipeline*:
  http://www.techtalentpipeline.nyc/
- Coalition for Queens: Access Code*:
  http://www.c4q.nyc/accesscode/

Ask students to complete the job training research sheet. Circulate to help students notice which information is and isn’t on the website.

If computers are not available, distribute paper copies of the job training programs listed above.
DISCUSS

- What did you learn from this research about job training programs (about the programs, possible careers, or how to research a training program)?

- What else would you need to do besides look at the website to be fully informed about the training program?

- What qualities make a good job training program?

- Did you learn about a job training program that was interesting to you? Why or why not?
Developing Research Questions for Job Training Programs

Write six questions you would like answered about your chosen job training program.

1.

2.

3.

4.

5.

6.
Technology Training Program Research

Now that you have researched your chosen job training program, use the Know Before You Enroll Tips to try to determine the quality of the program. For each tip in the left column, discuss how your job training program does or does not measure up and how you determined this.

Job Training Program Name: ________________________________

Program Location/Company: ________________________________

<table>
<thead>
<tr>
<th>Know Before You Enroll Tip</th>
<th>How Does My Job Training Program Measure Up?</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Free and low-cost adult education and training options are available.</td>
<td></td>
</tr>
<tr>
<td>#4 Avoid unlicensed schools.</td>
<td></td>
</tr>
<tr>
<td>#7 Ask for the school’s tuition cancellation policy in writing.</td>
<td></td>
</tr>
<tr>
<td>#9 Avoid schools that “guarantee employment” after you graduate.</td>
<td></td>
</tr>
</tbody>
</table>

Do you consider your job training program to be of high quality? Why or why not?

What additional questions do you have?

Are you interested in this training? If yes, why? If no, how can this research activity assist you in researching training programs in your field?
Now that students have been exposed to many careers and are developing preferences, they will begin to wonder, how can I work in this field? CUNY offers dozens of certificate and degree programs in Information Technology. Students do not need to choose one immediately, but should become comfortable learning how to research them.

**ACTIVITIES IN THIS SERIES:**

- 5.1 • Researching CUNY Degree and Certificate Programs in Information Technology*
- 5.2 • Understanding Degree Program Requirements*
- 5.3 • CUNY IT Certificates: A+ Certification and BICSI Cable Installation*
- 5.4 • How Do I Enroll in CUNY?*
Background on CUNY*

The City University of New York has campuses in all five New York City boroughs. It is comprised of 24 colleges in total, offering Associate’s, Bachelor’s, Master’s, Doctoral and Professional degrees, in addition to Certificate programs. Degree programs are offered through the college’s academic departments. Certificate programs are generally offered through the Continuing Education departments.

CUNY COMMUNITY COLLEGES

CUNY’s community colleges, also known as 2-year colleges, include the Borough of Manhattan Community College, Bronx Community College, Guttman Community College, Hostos Community College, Kingsborough Community College, LaGuardia Community College and Queensborough Community College. These colleges offer Associate’s degrees and Certificates. Many adult education students enter degree programs through CUNY’s community colleges.

CUNY SENIOR COLLEGES

CUNY’s senior colleges include Baruch College, Brooklyn College, Queens College, York College, The City College of New York, Lehman College, Hunter College and John Jay College of Criminal Justice. All of these offer Bachelor’s degrees. Medgar Evers College, New York City College of Technology and the College of Staten Island offer Bachelor’s and Associate’s degrees.
Understanding Degrees vs. Certificates

Most CUNY colleges* offer both certificate and degree programs. Following are some of the main distinctions.

**WHAT ARE DEGREES AND CERTIFICATES?**

College degrees require several years of study and include coursework in a student’s major as well as foundational coursework in subjects like English, Math and Science. Degree programs require that students have high school or equivalent diplomas, be accepted for admission to the college, and pass placement exams before enrolling in courses for credit. Most Associate’s degrees require 60-65 credits.

Certificate programs vary in their requirements and details. Some are credit-bearing, while others are not. Most require a high school or equivalent diploma, but some do not. Some certificate credits earned may transfer into a degree program if students decide to pursue a degree at a later date. Some lead to licensure, which may have requirements of its own, such as legal residency.

**HOW CAN I PAY FOR DEGREES AND CERTIFICATES?**

The tuition for degree programs is a flat rate for full-time students, those who take 12 or more credits per semester. Part-time students, those who take fewer than 12 credits per semester, are charged a rate per credit hour. Students who receive Financial Aid from the federal and/or state governments can use these grants toward tuition. Other sources of financial support for degree programs include loans and scholarships. CUNY also offers a payment plan allowing students to pay tuition in installments.

The college’s Financial Aid cannot be used for non-degree programs. Financial support for Certificate programs include other government grants, loans and scholarships. Public Assistance grants can be used toward many Certificate programs.

Some students who are not eligible for federal or state Financial Aid may be eligible for scholarships specifically intended for them, such as in the case of undocumented students.
WHICH IS BETTER, DEGREE OR CERTIFICATE?

Both are valid and useful forms of education. Students need to assess their own situations and career goals in order to decide which is right for them. They should consider:

- How much time they can devote to education, on a weekly basis and in total numbers of years.
- What kind of career they are interested in preparing for.
- How much money they can spend on education, including paying out of pocket, using payment plans, or financial aid if eligible. The college websites list tuition charges as well as information on applying for financial aid, scholarships and payment plans.
- If they are willing to take on the sometimes lengthy process of applying for scholarships, including writing personal essays.
- How much weight the credential (degree or certificate) carries in the labor market, in particular, if it is required or beneficial for the career they want to pursue.
Researching CUNY Degree and Certificate Programs in Information Technology*

Students practice using a college website to locate degree and certificate programs in Information Technology, then choose one degree program to research in further detail.

PREP

1. Go to the Borough of Manhattan Community College (BMCC)* website, www.bmcc.cuny.edu. Click on Academics, then Academic Programs and read about the Technology degrees offered, particularly the Computer Information Systems major.

2. Next, visit the Continuing Education department by going back to the main Academics page and clicking on Continuing Education. Then click on Find Your Course and explore Information Technology courses.

3. Be prepared to discuss the terms: college major, college degree, certificates and credential. (See previous pages for definitions.)

4. Write the URL for Borough of Manhattan Community College on the board: www.bmcc.cuny.edu

MATERIALS

- This session requires use of a computer lab.
- Information Technology Majors and Certificates at Borough of Manhattan Community College* worksheet
- Exploring a College IT Degree worksheet

EXPLAIN

1. Colleges and universities generally offer a number of different programs that culminate in students earning certificates, Associate’s degrees and Bachelor’s degrees, among others. **What are the big differences between these programs?**

   - Amount of time in program, cost, level of credential, depth of study, courses offered.
What is the difference between a college major and a college degree?

A major is the subject, program or area of study. A degree is the credential you earn when you complete the program (Bachelor’s, Associate’s, Master’s, etc.).

In many, though not all fields, a degree is considered a higher level credential than a certification, but some careers do not require more than a certificate, so both are important to consider. Most jobs in the Technology field require a degree or certificates. Today you’re going to explore Information Technology (IT) programs that BMCC* offers.

Distribute Information Technology (IT) Certificates and Majors at Borough of Manhattan Community College worksheet.

Ask students to navigate to the college’s website (written on the board), then click on Academics, then Continuing Education, then Find Your Course, and identify certificate programs in Information Technology and write them on the worksheet. There are a lot; They should choose a few that sound interesting or that they would like to learn more about, and write them on the worksheet.

Ask students to navigate back to Academics, then Academic Programs, and identify majors that prepare students for careers in Information Technology, keeping in mind that they may go by a variety of different names, and write them on the worksheet.

Discuss the experience of using the website. Was it easy to navigate? Difficult? What helped you find what you were looking for?

BMCC has so many offerings in Information Technology. When choosing a program, it’s important to find out in-depth information about exactly what you will be studying and what the credential will prepare you for. We’re going to explore one degree program more in-depth: The Associate’s of Applied Science (A.A.S.) in Computer Information Systems. Ask students to navigate to the description of this degree.

Distribute Exploring a College Technology Degree worksheet. Ask students to complete the worksheet based on the information on the A.A.S. in Computer Information Systems degree program.
Information Technology (IT) Certificates and Majors at Borough of Manhattan Community College

Use the college website to find majors and certificates in Information Technology offered at the college. For college majors that lead to degrees, look under the Academics section of the website. For certificate programs, look in the Continuing Education Department. List a minimum of 8 in total.

College Website: www.__________________________cuny.edu

CERTIFICATES IN INFORMATION TECHNOLOGY
1. 
2. 
3. 
4. 

Describe where on the college website you found this information:

MAJORS LEADING TO DEGREES IN INFORMATION TECHNOLOGY
1. 
2. 
3. 
4. 

Describe where on the college website you found this information:
Exploring a College Information Technology Degree

Go to www.bmcc.cuny.edu. Use the college website to read about the Computer Information Systems major, then paraphrase the information to complete the questions below. Make sure the answers are in your own words.

1. What is the name of the program?

2. What type of degree is it (Associate’s in …)?

3. Name three things you will learn or practice in this program.
   1. 
   2. 
   3. 

4. How many credits does the degree require?

5. Where is the office on campus to find out more about it?

6. Is there an internship, placement, or practice portion of this program? Explain.

7. Write about one part of the program that sounds interesting to you and explain why. Write about one part that sounds like it might be difficult for you and explain why.
Understanding Degree Program Requirements*

Students read a description of a sample Technology major and identify the roles of various general education requirements within the overall course of study. Requirements of majors at other colleges may be organized differently from those at CUNY.

PREP

Researching college degrees involves learning about which courses are required of which majors. Every major has course requirements. Some requirements specify a particular course; other requirements allow students to choose from several related courses. Most students are required to take two semesters of English composition. Other requirements may include Math, Science, Humanities, Social Sciences, Foreign Languages and/or Arts courses. Sometimes students have difficulty understanding the relevance of general education requirements to their major.

Requirements for majors are divided into three main areas—Curriculum Requirements, which are the courses that relate directly to the major; and General Education requirements, which are divided into two parts: Required Core and Flexible Core requirements. Course requirements of the major are usually outlined in the description of the major in the Academics section of the college website. See the description of the Computer Information Systems major at Borough of Manhattan Community College on the next page as an example.

Read the Computer Information Systems description in the BMCC website, and practice navigating there from the Academics area of the BMCC website.

MATERIALS

This session requires use of a computer lab.
EXPLAIN

1. Today we’re going to practice navigating a college website to learn how to identify the courses required for a given major. We’re going to use Computer Information Systems as a sample major. In the future, you will be able to research a major or certificate that you are interested in, using your skill in navigating college websites.

   What do you think the Computer Information Systems major is all about?
   - Preparing students for a career working with computer programs and systems.

2. What courses do you think are required for this major?
   - computer programming, database, networks, web development

3. Today we’re going to learn how to navigate a college website to find the required courses. We’re going to use Computer Information Systems as an example so that in the future you will be able to look at the major or certificate that you are interested in. Write www.bmcc.cuny.edu on the board and have students navigate there, circulating to make sure they are all on the correct page. Then ask them to click on Academics, then Academic Programs, then Computer Information Systems (A.A.S.).

4. Explain that the major requirements come in two parts: **curriculum requirements** and **general education requirements**. General education requirements are further divided into **core** and **flexible core** requirements. Curriculum requirements are the courses that directly relate to the major or career. Core and flexible core requirements are courses that students in this and other majors take across a variety of departments, many of which prepare students for further study in their major area.

5. Ask students to read through all the requirements and explain that each requirement is linked to a course description that includes more detailed information.

6. Divide students into groups of three and ask them to complete the *Understanding General Education Requirements* worksheet.
## Computer Information Systems (CIS)

Computer Information Systems focuses on the application of computers in a business environment with an emphasis on the analysis and design of business information systems. Upon completion of program requirements, students are awarded the Associate in Applied Science (A.A.S.) degree.

### Common Core

### Required Common Core

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 150</td>
<td>Introduction to Statistics</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 200</td>
<td>Introduction to Discrete Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 206</td>
<td>Precalculus</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 301</td>
<td>Analytic Geometry and Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>

### Life and Physical Sciences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 110</td>
<td>General Astronomy</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHY 110</td>
<td>General Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

### Total Required Common Core 14

### Flexible Core

Choose 6 credits from 1 or 2 of the following areas:

<table>
<thead>
<tr>
<th>Area</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative Expression</td>
<td>3</td>
</tr>
<tr>
<td>Individual and Society</td>
<td>3</td>
</tr>
<tr>
<td>U.S. Experience in its Diversity</td>
<td>3</td>
</tr>
<tr>
<td>World Cultures and Global Issues</td>
<td>3</td>
</tr>
<tr>
<td>Scientific World</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 110</td>
<td>Computer Programming I</td>
<td>4</td>
</tr>
</tbody>
</table>

### Total Flexible Core 10

### Total Common Core 24
### Curriculum Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 210</td>
<td>Computer Programming II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 345</td>
<td>Telecommunication Networks I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 440</td>
<td>UNIX</td>
<td>3</td>
</tr>
<tr>
<td>CIS 395</td>
<td>Database Systems I</td>
<td>4</td>
</tr>
<tr>
<td>CIS 495</td>
<td>Database Systems II</td>
<td>3</td>
</tr>
<tr>
<td>CIS 385</td>
<td>Web Programming I</td>
<td>3</td>
</tr>
<tr>
<td>CIS 485</td>
<td>Web Programming II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 122</td>
<td>Accounting Principles I</td>
<td>3</td>
</tr>
<tr>
<td>BUS 104</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUS 200</td>
<td>Business Organization and Management</td>
<td>3</td>
</tr>
<tr>
<td>XXX XXX</td>
<td>Elective—Choose from ACC, BUS, CIS, CSC or MMP courses</td>
<td>6</td>
</tr>
</tbody>
</table>

| Total Curriculum Credits | 36 |
| Total Program Credits   | 60 |
Understanding General Education Requirements*

Read the Computer Information Systems description on the Borough of Manhattan Community College website, http://www.bmcc.cuny.edu. For each course listed, click on the link to read the course description, then reach your own conclusions about how the course will benefit Computer Information Systems students to answer the questions below.

1. **English Composition**
   How will this course help Technology professionals?

2. **Life and Physical Sciences**
   Why do you think this course is required?

3. **Creative Expression**
   What is this and why is it required for Computer Information Systems majors?
Section 5.2

4. What do students do in CIS 345 and why is it required?

5. Describe 3 differences between the Flexible Core and Curriculum Requirements.

7. Having learned about Computer Information Systems, is this a career you would consider pursuing? Why or why not?
CUNY IT Certificates: A+ Certification and BICSI Cable Installation*

Having researched degree programs, students will now learn about certificate programs. The handout on the following page is meant to give students a glimpse of two of the most widely recognized entry-level technology credentials offered at some CUNY campuses. Unlike most of the CareerKit activities, it is meant for informational purposes only and is not meant to reinforce literacy skills.

EXPLAIN

1. Certificate programs can be credit-bearing or not, require one semester or many semesters of study, may be open to diploma-holders only or may be open to those who have not yet earned diplomas. There is a lot of variation in certificate programs. In CUNY, they are housed in the Continuing Education departments. As the needs of industries change, colleges are adding and updating certificate programs all the time. The most up-to-date information can be found through the Continuing Education offices.

2. One notable certificate program is A+ Certification Test Prep. Among the certifications available for computer professionals, A+ is one of the most frequently cited as a starting point for careers in Information Technology (IT). Many people view A+ certification as an entry point to find jobs as computer service technicians or to gain enough skills to move on to further training. CUNY campuses offer an A+ certificate program, preparing students for the A+ certification exam.

3. Another valuable technology certificate program is BICSI Cable Installation. The current rise and inevitable continued growth of the need for internet access positions cable installation as a career on the rise. Cable installers work in homes and businesses to install and repair telecommunications cables. This includes phone lines, internet cables and cable television. If it comes into your home or office through a cable, then a cable installer put it there. Cable installers typically drive to people’s homes in vans or trucks that are outfitted with the tools and materials needed to install or repair cables, and are prepared for different types of installations, whether they be under the house, on top of a building or up a pole. They test lines when there is trouble reported by the customer, and modify, adjust or replace equipment that is malfunctioning. This is a good job for people who like working with the public.

* The fliers on the next pages outline these certificate programs at New York City College of Technology/ CUNY. There may be differences in requirements and program details in similar certificate programs at different CUNY colleges, so researching individual programs is always recommended.
A+ CERTIFICATION TEST PREP WITH LAB

Sec B: Tues & Thurs, 6–9 pm, 1/26–4/14
Sec C: Tues & Thurs, 6–9 pm, 4/26–6/30

70 Hours, $950
(Two payment installment plan available)

This course provides hands-on applications and instruction in areas covered by the two CompTIA certification examinations. Topics covered in the course include motherboards, memory, processors, video, storage media and devices, printers, operating systems, networking, virtualization, mobile devices, security and troubleshooting. Additional expenditures of approximately $130 in text books and personal tools will be needed for this course. (The A+ exams are not offered as part of this program. Students must make exam arrangements and pay independently).

Prerequisite: Basic computer application skills

BICSI CABLE INSTALLATION

BIC 100
Fri, 6:00–9:00 pm, 1/29–6/10

54 Hours, $800
(Two payment installment plan available)

Prepare for a career in the expanding telecommunications industry with this Level 1 intensive training course in cabling installation approved by the Building Industry Consulting Services International, Inc. (BICSI). Successful completers will receive a completion certificate from the college. Students are also encouraged to apply for the BICSI Registered Installer Level 1 certification examination. Successful completion of both the written and performance parts of the Level 1 certification exam will enhance employment opportunities. Students will need to purchase a training manual, about $125.
How Do I Enroll in CUNY?*

CERTIFICATES

CUNY certificate programs are administered through the colleges’ Continuing Education departments. Students should contact the college’s Continuing Education office to determine if there are any prerequisites, as well as the cost, schedule, location, deadlines and other pertinent information. Many programs require a high school diploma or equivalency as a prerequisite, but some, such as home health aide, do not.

In addition to the programs that CUNY offers, there are a range of low-cost or free short-term certificate programs in New York City offered at community-based organizations.

DEGREES

Once students have received a high school diploma or equivalent, they may apply to a CUNY college. They should research which college they want to attend, in order to find the best fit for their needs and interests. Once they are accepted, they will take placement exams in Reading, Writing and Math, which will determine whether they are placed into credit or developmental (remedial) courses. Students who need remediation should consider enrolling in CUNY Start or CLIP to improve basic skills at a low cost.

STEP 1: Research programs and colleges

There are many factors to consider when researching a college program, such as:

- Does it offer the major I am interested in?
- Where is the college located and how will I get there?
- Can I afford the tuition, either through payment, financial aid or scholarships?
- Are classes offered at times that work for me?
- How much time will I need to devote to attending classes, commuting and class preparation, including reading, completing assignments, group projects, and preparing for exams?

STEP 2: (May be concurrent to Step 1) Earn high school or equivalent diploma.

STEP 3: Apply to CUNY through the college’s Admission Office, known as Direct Admit, or online through the college website.
**STEP 4:** Apply for Financial Aid—Pell, the federal grant and TAP, the New York State grant, through the website, www.fafsa.gov

**STEP 5:** Once accepted, take CUNY placement exams in Reading, Writing and Math.

**STEP 6:** If remediation is required, enroll in CLIP or CUNY Start.

The CUNY Language Immersion Program is for students who are non-native English speakers and need to improve their reading and writing in English before enrolling in credit-bearing college courses.

CUNY Start is for fluent English speakers who need to improve reading, writing or math skills before enrolling in credit-bearing courses.

**STEP 7:** Attend New Student Orientations.
Special Programs

Beginning college can be overwhelming to many new students. The following CUNY programs provide students with smaller settings and more individual attention, academic support, such as instructional immersion and tutoring, financial support, such as contributing to tuition, travel expenses and book costs, and personal and academic advisement.

LOW COST PROGRAMS FOR STUDENTS WITH REMEDIAL NEEDS

CLIP (CUNY Language Immersion Program)—An intensive English as a Second Language (ESL) program for CUNY students who need to improve their academic English language skills. Classes meet five hours a day, five days a week, in day or evening sessions in all five boroughs.

CUNY Start—Provides intensive preparation in academic reading, writing, math, and advisement. An academic program with social supports, CUNY Start helps students prepare for college level courses and re-take placement exams in Reading, Writing and Math.

FINANCIAL AND ACADEMIC SUPPORTS FOR DEGREE STUDENTS

ASAP (Accelerated Studies in Associate’s Programs)—Helps associate degree students earn their degrees as quickly as possible, ideally within three years. ASAP includes a consolidated block schedule, cohorts by major, small class size, and requires full-time study. It also includes tuition waivers for financial aid-eligible students, textbook assistance, and monthly MetroCards.

College Discovery—Available to financially eligible students, College Discovery offers a pre-college summer program, tutoring, counseling and advisement, tuition assistance, book and materials stipends.

The above programs are university-wide programs. Individual CUNY colleges offer additional programs. Representatives are often available to present on panels or to classes.