

YOUTH OPINIONS OF CAREERS IN INFORMATION TECHNOLOGY

December 2017

Technology plays a pivotal role in the lives of teenagers. From entertainment and staying in touch with friends to supporting learning in and outside of the classroom, it is not an exaggeration to say technology is an extension of their being. The latest research from CompTIA confirms these points, as well as revealing a growing interest in information technology (IT) careers. The increasing Interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

KEY POINTS

Digital natives love affair with technology continues

Technology is interwoven in the lives of teens today and there is near universal acknowledgement of the fact that they like/love technology. Not only do they profess a love of technology but they are frequently the first point of call for parents/family in need of assistance or help troubleshooting a technology problem.

Perceptions of careers in information technology (IT) are generally positive, but challenges persist

Teenagers in the 13-17 age range see IT careers as being lucrative with the opportunity to do creative, innovative work. Teens also think that working in technology means the possibility to work in an appealing work environment with smart people and plentiful jobs. Moreover, with the staggering cost of higher education, students are increasingly considering the alternatives. Just about a quarter of respondents (26%) in the research are aware of and cite the availability of pathways into IT careers that bypass the traditional 4-year college degree as appealing.

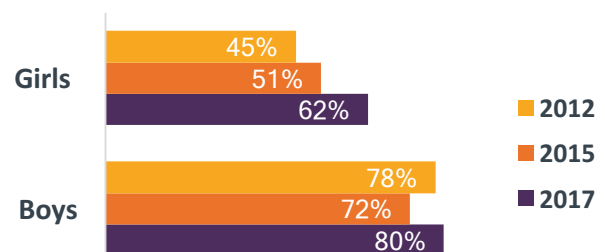
Despite these positives, there are a number of offsetting negative perceptions. Nearly half of teenagers are concerned that careers in IT could be isolating, with long stretches of sitting alone in front of a computer all day. Girls more than boys have this perception.

Interest in IT careers is on the rise, especially among girls

There is growing interest in careers in technology and teenagers today are more open to the possibility of considering a career in the space. Since 2012, net interest has increased by 10 percentage points, according to CompTIA research. When presented as specific occupations, such as working with robotics or designing apps, interest is even higher.

While the trend is heading in the right direction – which is critically important given a shortage of IT workers in many areas, it must be acknowledged that many young people who could be candidates for pursuing a career in IT will fall by the wayside. Some of this can be attributed to information gaps. While most schools provide some type of information or career guidance for IT jobs, nearly 3 in 10 do not provide anything, according to the students in the study.

NET Interest in Considering a Career in IT

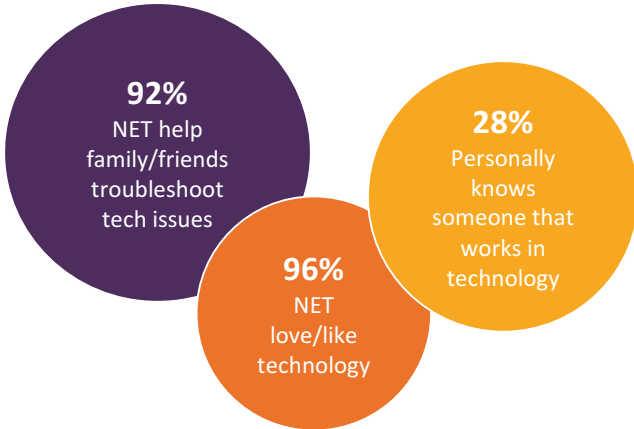


Base: 1,006 U.S. respondents age 13-17, Boys=500, Girls=506

Teens Affirm Their Love of Technology

Technology is an integral part of the lives of teens today and this trend is very consistent with what has been seen in previous iterations of this research in 2012 and 2015. The vast majority go so far as to say they ‘love’ technology – this is slightly more pronounced among boys (74%) when compared to girls (65%).

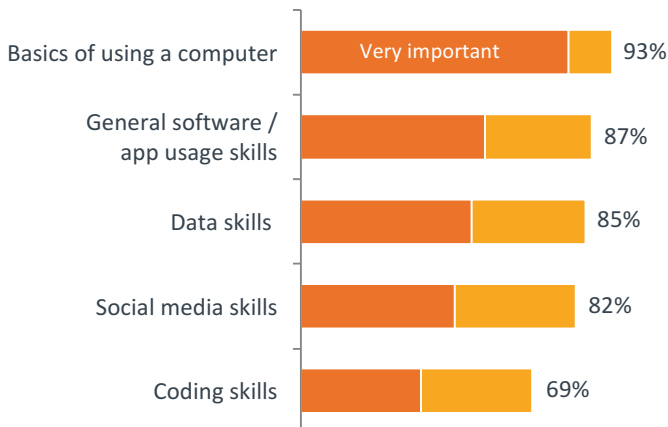
The data indicates love of technology is consistently high across ages, regions, and race. (See Appendix for details)



Teens also realize that the skills they gain from using technology are eminently transferable to future careers – more so with basic computer skills or using apps when compared to coding skills. Confirming other research in this area, girls find more value in social media skills. More boys than girls believe that coding has applicability in future jobs.

Interestingly, data skills rate relatively high. While most students gain exposure to using data and some degree of data analysis through their high school years, it’s impressive to see so many make the leap ahead in anticipating the importance of data skills to future endeavors.

Student Rating of Skills that will be Important to Their Future



Perceptions of Careers in Information Technology

An analysis of what teenagers think of jobs in technology reflect both largely positive and some negative perceptions. Chief among the positives is the perception that jobs in IT pay well and the potential to do creative, interesting work on innovative ideas. The opportunity to use technology to make a difference and help people is also cited by the majority of teenagers. Many of these positive perceptions are very consistent with what teenagers thought in previous iterations of this study. There are also no notable differences between what teenage boys and girls note when it comes to positive aspects of working in a technology job.

To a lesser extent, there is a perception good math and science skills are a pre-requisite for an IT career and that the work is difficult and complicated.

Some perceptions change as students get older such as believing that working in IT provides the opportunity to use technology to make a difference or the availability of tech jobs likely because they have had access to more information as they get closer to making decisions about college/potential career paths.

When asked about interest in specific areas of IT, designing video games (was especially popular among boys with 65% saying they could see themselves working in this area), designing apps for smartphones, and working in emerging technology like robotics were popular among teenagers. The relatively high interest in specific IT careers, represents an opportunity to build more interest in IT careers, in general.

	Age 13	Age 17
Positive Perceptions		
Pays well	58%	58%
Opportunity to be creative / work on new products, apps, etc.	60%	56%
Opportunity to use technology to make a difference	49%	57%
Lots of available jobs	33%	46%
Appealing work environment / work with fun, smart people	42%	43%
A job that's well respected	29%	40%
Negative Perceptions		
Working alone sitting in front of a computer all day	39%	45%
Difficult, complicated work	30%	40%
Jobs are mostly located in Silicon Valley and large cities	19%	21%
Boring work	16%	21%

Information Sources for IT Careers

The sources that can be used to communicate to students about IT careers are teachers or the career counselor in school. The majority of students in our sample look to schools to provide information on potential career options. Boys (41%) more than girls (33%) find YouTube videos with career guidance useful.

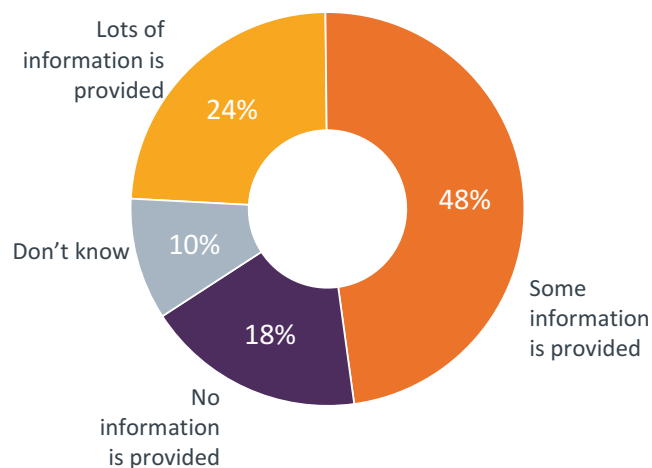
Teens tend to look to people in their close circle, family or people who they know that work in the industry as reliable sources of information. This might represent a problem because less than 3 in 10 (33% of boys and 24% of girls) know someone that actually works for a technology company or has a job in technology. The solution might be to provide more job specific information (along the lines of a day in the life of IT workers in various jobs) to bridge the gap of not knowing someone who can provide information on the specifics or the first hand information that teens might be looking for.

The first hand experience that teens seek could also come from apprenticeship programs or on-the-job exposure to different IT career options.

Many schools provide IT career related information. While the number of schools providing at least some IT career related information has increased to 72% in 2017 when compared to 62% in 2015, there is potentially an information gap here that is inhibiting students' pursuit of IT careers.

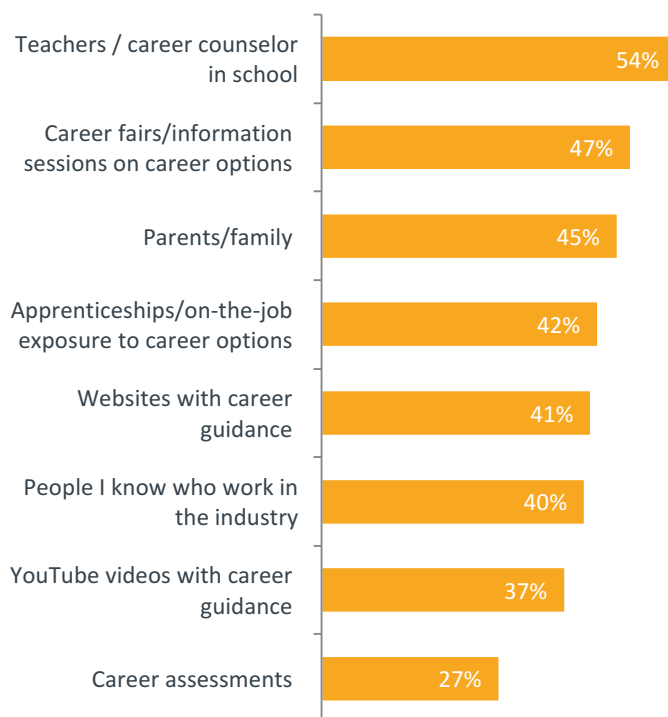
The data suggests that there will be more than 1 million IT job openings due to growth and replacement needs in 2024 (see Appendix for details) underscoring the need to understand teens perceptions of IT careers.

Schools and IT Career Information



Base: 1,006 U.S. respondents age 13-17, Boys=500, Girls=506

Where Students Turn for Career Guidance



Exploring Career Pathways

Four out of 5 teenagers have given some thought to potential future careers. About half say they have a pretty good idea of what they want to do while the other half say they are considering a number of options. Seven in 10 teenagers are open to the possibility of a career in the IT arena. This represents an uptick in interest in IT careers – in 2015, 62% said they were interested in an IT career. The increasing interest in IT careers is likely driven by rising interest among girls.

While the growing interest in IT careers is positive, it could likely be higher. Some of this might be attributed to the lack of information about IT careers – less than a third know someone who works in IT and it is noteworthy that 45% look to parents/family when trying to learn about career options. Programs such as those from the Creating IT Futures, [FUSE](#) and [TechGirly](#) are examples of efforts aimed at bridging the information gap when it comes to IT career guidance.

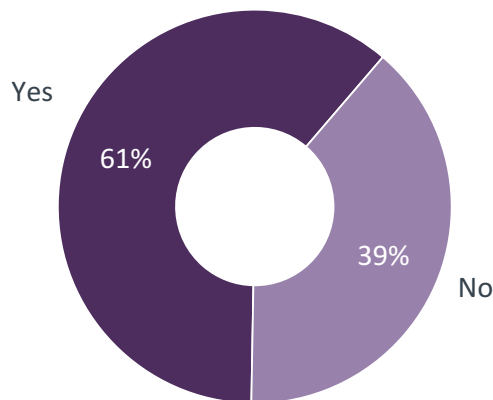
Data from the National Science Foundation (NSF, Science and Engineering Indicators, 2016) indicates that female students do as well as male students in math and science and female students enroll in high level mathematics and science courses at similar rates as their male peers, with the exception of computer science and engineering. Women earned more than half (57%) of bachelor's degrees in all fields in 2013 and half of science and engineering bachelor's degrees.

Teens Ponder the Future of Work

While technological displacement and automation has been a facet of life since the industrial revolution, recent advances in artificial intelligence have raised new questions – and new concerns. In addition to the usual stories about the wonders of autonomous vehicles, robotics, or virtual reality, media outlets, governments, and other institutions increasingly ponder the impact to the workforce.

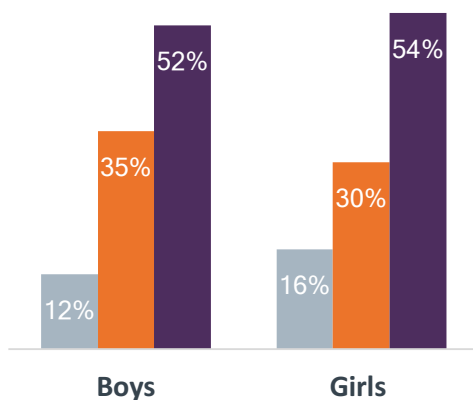
These discussions are not lost on young people. Six in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. A third report not being concerned and expect future technologies are unlikely to replace human jobs. Older students are more aware of this trend and are more concerned about automation. Being closer to graduation and facing the working world might explain the reason for increased interest in the potential impact of automation (see Appendix for data by age).

Awareness of Automation Trend and Possible Displacement of Workers



Concern Over Possible Job Loss Due to Automation

■ Don't know ■ Not concerned ■ Concerned



Base: 1,006 U.S. respondents age 13-17, Boys=500, Girls=506

About This Research

CompTIA's *Youth Opinions of Careers in Information Technology* study explores what young people (ages 13-17 years) think about a job in the technology industry and the prospects of considering a career in IT.

The quantitative study consisted of an online survey fielded to 13 to 17 year old respondents during November 2017. A total of 1,006 respondents participated in the survey, yielding an overall margin of sampling error at 95% confidence of +/- 3.2 percentage points. Sampling error is larger for subgroups of the data. Prior year surveys had similar sample sizes and margins of error.

As with any survey, sampling error is only one source of possible error. While non-sampling error cannot be accurately calculated, precautionary steps were taken in all phases of the survey design, collection and processing of the data to minimize its influence.

CompTIA is responsible for all content and analysis. Any questions regarding the study should be directed to CompTIA Research and Market Intelligence staff at research@comptia.org.

CompTIA is a member of the market research industry's Insights Association and adheres to its internationally respected Code of Standards.

About CompTIA

The Computing Technology Industry Association (CompTIA) is the leading non-profit trade association serving the information technology industry and workforce.

With approximately 2,000 member companies, 3,000 academic and training partners, 100,000-plus registered users and more than 2 million IT certifications issued, CompTIA is dedicated to advancing industry growth through educational programs, market research, networking events, professional certifications and public policy advocacy.

[Creating IT Futures](#), the charitable arm of CompTIA, is taking on this workforce challenge through research, program development and partnering. The organization creates on-ramps for more individuals, including young people, to prepare for, secure and succeed in IT careers.

APPENDIX

Teens Affirm Their Love of Technology

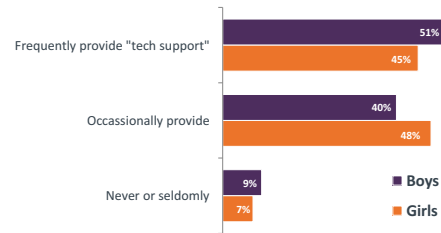
Relationship with Technology	Gender			Region				Race		
	Total	Boys	Girls	North East	Mid West	South	West	White	Black	Hispanic
Love technology	69%	74%	65%	68%	72%	69%	69%	68%	75%	70%
Like technology	27%	23%	31%	28%	25%	27%	26%	29%	23%	24%
Technology is just okay	3%	3%	4%	4%	3%	4%	4%	3%	2%	5%
Dislike technology	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Teens Put Their Tech Skills to Use in Helping Family Members and Friends

Overall, 48% frequently provide "tech support," such as answering questions or troubleshooting issues with computers, software or mobile devices for family members or friends.

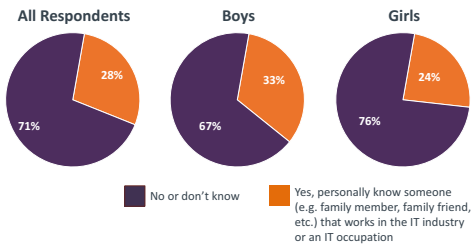


CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Many Teens Do Not Have First-Hand Knowledge of What It Is Like to Work in IT

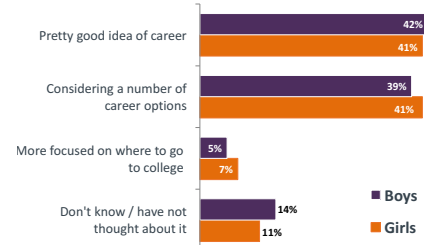
Incidence of personally knowing someone that works in the IT industry or an IT occupation.



CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Teens Begin to Think About Career Options



CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Positive Perceptions of Working in IT Occupations by Segment

Perceptions of a job in IT	Gender			Age				
	Total	Boys	Girls	13	14	15	16	17
Pays well	64%	65%	63%	58%	67%	71%	68%	58%
Opportunity to be creative	59%	59%	58%	60%	60%	60%	59%	56%
Interesting work	53%	54%	51%	50%	43%	59%	59%	52%
Opportunity to use technology to make a difference	51%	50%	53%	49%	49%	50%	50%	57%
Opportunity to use technology to help people	50%	49%	52%	46%	50%	50%	54%	51%
Lots of available jobs	44%	44%	44%	33%	44%	47%	51%	46%
Appealing work environment	42%	42%	42%	42%	40%	46%	41%	43%
Having a job that's well respected	35%	32%	37%	29%	32%	38%	34%	40%
Opportunity to get a job in tech without a four-year college degree	26%	26%	26%	23%	21%	32%	29%	25%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Negative Perceptions of Working in IT Occupations by Segment

Perceptions of a job in IT	Gender			Age				
	Total	Boys	Girls	13	14	15	16	17
Working alone sitting in front of a computer all day	43%	39%	48%	39%	45%	47%	41%	45%
Requires good math and science skills	36%	34%	38%	33%	32%	37%	38%	40%
Difficult, complicated work	34%	31%	37%	30%	30%	31%	40%	40%
Jobs are mostly located in Silicon Valley and large cities	24%	21%	27%	19%	22%	27%	30%	21%
Requires too much training/education to get a job in tech	23%	24%	22%	21%	20%	21%	25%	26%
Boring work	20%	18%	21%	16%	18%	16%	26%	21%
Just for tech geeks	14%	12%	16%	15%	20%	15%	10%	12%
Not a lot of people like me in tech	11%	12%	11%	10%	12%	12%	14%	8%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Interest in Specific Areas of Technology

	Gender		
	Total	Boys	Girls
Designing video games	49%	65%	34%
Designing apps for smart phones	41%	42%	40%
Designing websites	34%	34%	34%
Working with emerging technology, i.e. robotics, virtual reality, etc.	33%	41%	25%
Working to help others use technology, i.e. answering their questions or fixing their computer problems, etc.	25%	26%	23%
Working in cybersecurity / defending against hackers	23%	27%	18%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Schools and Information about Technology Careers

	Gender			Age				
	Total	Boys	Girls	13	14	15	16	17
Yes, lots of information is provided	24%	27%	21%	19%	20%	26%	28%	28%
Yes, some information is provided	48%	46%	50%	42%	48%	49%	50%	49%
Interesting work	53%	54%	51%	50%	43%	59%	59%	52%
No, nothing is provided that I am aware of	18%	18%	18%	26%	20%	15%	14%	15%
Don't Know	10%	10%	11%	13%	12%	11%	7%	9%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

APPENDIX

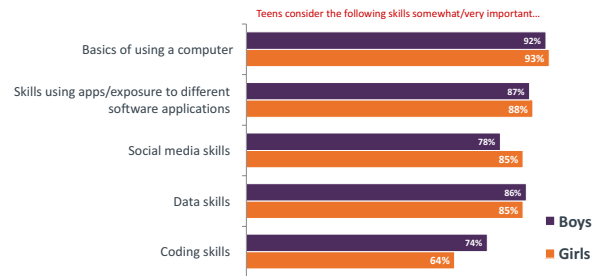
Sources for Career Guidance

	Total	Gender	
		Boys	Girls
Teachers / career counselor in school	54%	51%	57%
Career fairs / information sessions on job/career options	47%	42%	51%
Parents / family	45%	45%	45%
Apprenticeships / on-the-job exposure to career options	42%	39%	44%
Websites with career guidance	41%	40%	42%
People I know who work in the industry/field	40%	42%	39%
YouTube videos with career guidance	37%	41%	33%
Career assessments	27%	24%	30%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Perceptions of Applicability of Skills to Future Careers



CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Young Express Concern Over the Possibility of Automation

	Age				
	13	14	15	16	17
Somewhat concerned - these technologies may mean fewer jobs for people like me	49%	49%	59%	53%	55%
Not that concerned - don't see these technologies able to do the jobs of humans	32%	35%	31%	36%	29%
Don't Know	19%	16%	11%	11%	16%

CompTIA

Base: Total 1,006 U.S. respondents age 13-17, Male=500, Female=506

Number of Young People Age 13-17

Age	Total	Gender	
		Boys	Girls
13	4,104,631	2,069,481	2,035,150
14	4,082,735	2,077,664	2,005,071
15	4,126,701	2,102,060	2,024,641
16	4,509,137	2,345,633	2,163,504
17	4,442,238	2,194,094	2,248,144
Total	21,265,442	10,788,932	10,476,510

CompTIA

Base: Current Population Survey, US Census

U.S. TECH OCCUPATION GROWTH PROJECTIONS

APPENDIX A.8

Core IT Occupations	Projected Employment 2024	Job Openings Due to Growth and Replacement Needs, 2014-2024
11-3021 Computer and Information Systems Managers	402,200	94,800
15-1111 Computer and Information Research Scientists	28,200	6,000
15-1121 Computer Systems Analysts	686,300	191,600
15-1122 Information Security Analysts	97,700	25,500
15-1131 Computer Programmers	302,200	81,000
15-1132 Software Developers, Applications	853,700	238,000
15-1133 Software Developers, Systems Software	447,000	107,900
15-1134 Web Developers	188,000	58,600
15-1141 Database Administrators	133,400	39,200
15-1142 Network and Computer Systems Administrators	422,800	79,400
15-1143 Computer Network Architects	158,900	31,500
15-1151 Computer User Support Specialists	661,000	150,500
15-1152 Computer Network Support Specialists	194,600	36,900
15-1199 Computer Occupations, All Other	240,800	37,700
17-2061 Computer Hardware Engineers	80,100	18,400
49-2011 Computer, Automated Teller, and Office Machine Repairers	134,800	28,600
SUBTOTAL	5,021,800	1,225,600
ENGINEERING, TECHNICIANS, REPAIRER, AND ASSEMBLER OCCUPATIONS		
11-9041 Engineering Managers	185,800	59,500
17-2011 Aerospace Engineers	70,800	20,700
17-2031 Biomedical Engineers	27,200	10,900
17-2071 Electrical Engineers	180,200	41,100
17-2072 Electronics Engineers, Except Computer	135,500	30,300
17-2112 Industrial Engineers	243,200	72,800
17-2131 Materials Engineers	25,600	9,200
17-2141 Mechanical Engineers	292,100	102,500
17-2199 Engineers, All Other	142,300	38,000
17-3021 Aerospace Engineering and Operations Technicians	11,800	3,200
17-3023 Electrical and Electronics Engineering Technicians	136,600	34,100
17-3024 Electro-Mechanical Technicians	14,800	3,700
17-3026 Industrial Engineering Technicians	63,500	16,300
17-3027 Mechanical Engineering Technicians	49,300	12,800
17-3029 Engineering Technicians, Except Drafters, All Other	69,900	17,100
27-4011 Audio and Video Equipment Technicians	79,400	21,900
27-4012 Broadcast Technicians	28,200	5,700
27-4014 Sound Engineering Technicians	17,400	4,300
43-9011 Computer Operators	49,500	4,600
51-4011 Computer-Controlled Machine Tool Operators, Metal and Plastic	174,800	71,200
51-4012 Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	29,900	12,400
49-2021 Radio, Cellular, and Tower Equipment Installers and Repairs	14,400	2,100
49-2022 Telecommunications Equipment Installers and Repairers, Except Line Installers	210,800	19,700
51-2020 Electronic Equipment Assemblers and Finishers	255,800	33,100
49-2090 Other Repairers, Installers, and Technicians	250,800	59,000
SUBTOTAL	2,759,600	701,200
TOTAL	7,781,400	1,926,800

Source: U.S. Bureau of Labor Statistics

CompTIA

Copyright (c) 2017 CompTIA Properties, LLC. | CompTIA.org | Cyberstates Page 106