

ncwit.org

COUNSELORS
FOR COMPUTING



NCWIT COUNSELORS FOR COMPUTING (C4C) RESOURCE BOOKLET

“

DURING HIGH SCHOOL, I WAS DISCUSSING CAREER OPTIONS WITH MY SCHOOL COUNSELOR. SHE SAW THAT I HAD BEEN TAKING A LOT OF CLASSES THAT UTILIZED PROBLEM-SOLVING SKILLS, SO SHE SUGGESTED I LOOK INTO COMPUTER SCIENCE (CS) AS A CAREER OPTION. WHEN I LEARNED HOW CS COULD BE A GREAT CREATIVE OUTLET FOR ME, I DECIDED TO PURSUE IT IN COLLEGE.

~ Calvin University Student Nikita S.

”

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See the back cover for additional resources you can use.

ABOUT NCWIT COUNSELORS FOR COMPUTING (C4C)

The NCWIT Counselors for Computing (C4C) program provides information and resources that help counselors join the front line of the computing conversation. We bring people and programs together with professional development, knowledge, and resources to give all students access to transformative computing careers. Find out more at www.ncwit.org/c4c.

ABOUT THE NATIONAL CENTER FOR WOMEN & INFORMATION TECHNOLOGY (NCWIT)

NCWIT is a non-profit change leader network of more than 1,600 universities, companies, non-profits, and government organizations nationwide working to increase the influential and meaningful participation of all girls and women — at the intersections of race/ethnicity, class, age, gender identity, sexual orientation, disability status, and other historically marginalized identities — in the field of computing, particularly in terms of innovation and development. Find out more at www.ncwit.org.

A MESSAGE FROM C4C

Dear Counselors and Educators:

NCWIT Counselors for Computing (C4C) is pleased to provide you with this booklet, filled with information and resources you can use to support *ALL* students as they explore Computer Science (CS) education and careers.

As a school counselor, you are an influencer. You advise and encourage students in their education and career aspirations, provide recommendations for course selections, and expose students to occupations through career fairs and internships. If students are to get the exposure and encouragement they need to pursue computing, it is essential that educators like you get up to speed on the knowledge and resources necessary to guide effectively.

CS underlies many other fields and disciplines. By understanding the intersection of CS with other industries, we can best equip today's youth for educational pathways to sustainable careers!

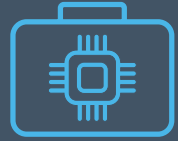
Sincerely,
The NCWIT C4C team

By the Numbers

57 Percent of professional occupations in the 2022 U.S. workforce held by women⁴

27 Percent of professional computing occupations in the 2022 U.S. workforce held by women⁴

23 Percent of total tech C-Suite positions held by women in Fortune 500 companies¹



4.2 million

Number of U.S. computing-related job openings expected by 2031⁵



25 Percent of these jobs that could be filled by U.S. computing bachelor's degree recipients by 2031⁵

55 Percent of Advanced Placement (AP) test-takers in 2022 who were not boys²

46 Percent of AP Calculus test-takers in 2022 who were not boys²

31 Percent of AP Computer Science test-takers in 2022 who were not boys²



389 Percent increase in AP CS exam takers who were not boys⁶

56 Percent of states in 2022 requiring high schools teach CS⁷

5 Number of states in 2022 requiring CS for high school graduation⁸



58 Percent of 2021 bachelor's degree recipients who were women⁹

22 Percent of 2021 Computer and Information Sciences bachelor's degree recipients who were women⁹

22 Percent of 2021 Computer Science bachelor's degree recipients at PhD-granting universities who were women³

37 Percent of 1985 Computer Science bachelor's degree recipients who were women⁹



27 Percent of computing workforce who were women in 2022⁴

3 Percent of computing workforce who were Black or African-American women in 2022⁴

7 Percent of computing workforce who were Asian women in 2022⁴

2 Percent of computing workforce who were Hispanic or Latina women in 2022⁴



SOURCES:

¹Women Business Collaborative, 2022. "Women Corporate Tech Executives in America."

²College Board AP Program Summary Report, 2022.

³Computing Research Association (CRA) Taulbee Survey, 2021.

⁴US Department of Labor (DOL) Bureau of Labor Statistics (BLS), Employed and Experienced Unemployed Persons by Detailed Occupation, Sex, Race, and Hispanic or Latino Ethnicity, Annual Average 2022. (unpublished table from Current Population Survey 2022).

⁵US DOL BLS, Occupational projections, 2021–31 (Occupational Category 15-1100). (Includes new and replacement jobs and assumes current undergraduate degree (CIP 11) production levels persist.)

⁶College Board AP Program Summary Report, 2016, 2022. (2022 data include gender category "another.")

⁷Code.org, State Tracking 9 Policies, 2022.

⁸Code.org, CSTA, & ECEP Alliance, 2022. State of Computer Science Education: Understanding Our National Imperative.

⁹Integrated Postsecondary Education System (IPEDS) at National Center for Education Statistics (NCES), (CIP 99, CIP 11) 2020-21, 1985-86.

WHY SHOULD YOUNG PEOPLE CONSIDER CAREERS IN COMPUTING AND INFORMATION TECHNOLOGY?

MEANINGFUL WORK

Computing and Information Technology (IT) professionals work on creative teams to develop innovative solutions that save lives, solve health problems, improve the environment, and keep us connected. Computing and IT professionals develop information systems and keep computers and networks operating. These jobs are available in nearly every industry, including art, finance, healthcare, and entertainment.

JOB SECURITY AND HIGH SALARIES THROUGH A VARIETY OF EDUCATION PATHWAYS

The U.S. Bureau of Labor Statistics predicts that computing and IT jobs will be among the fastest-growing and highest-paying over the next decade. In May 2021, the median annual salary for computer and IT occupations was \$97,430 — roughly \$52,000 higher than the median salary for all jobs!¹ Plus, students can obtain these high-demand positions through a range of educational pathways, including military experience and professional certifications, as well as two-year, four-year, and graduate degrees.

FLEXIBILITY AND A VARIETY OF CAREER OPTIONS

Many computing and IT careers offer flexible hours or telecommuting, making it easier to manage career and personal life. And, the career options are varied, including:

COMPUTER AND INFORMATION

RESEARCH SCIENTIST // https://bit.ly/CIResearch_2023

COMPUTER NETWORK

ARCHITECT // https://bit.ly/CIArchitect_2023

COMPUTER PROGRAMMER // https://bit.ly/CIProgrammer_2023

COMPUTER SUPPORT SPECIALIST // https://bit.ly/CISupport_2023

DATABASE ADMINISTRATOR // https://bit.ly/CIAdmin_2023

IT PROJECT MANAGER // https://bit.ly/CIManager_2023

INFORMATION SECURITY ANALYST // https://bit.ly/CIAnalyst_2023

SOFTWARE DEVELOPER // https://bit.ly/CISoftware_2023

WEB DEVELOPER // https://bit.ly/CIWebDev_2023

SPECIAL EFFECTS ARTISTS

AND ANIMATORS // https://bit.ly/CIAnimator_2023



View this resource in Spanish at: https://bit.ly/LasJovenes_2023.

WHAT SHOULD YOU TELL YOUNG PEOPLE ABOUT CAREERS IN IT?

IT'S IMPORTANT. They can use their skills to help solve pressing problems in a variety of fields.

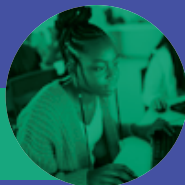
IT'S CREATIVE. They can use their creativity in many different jobs and roles; they will always find new challenges in their work.

IT'S TEAM-ORIENTED. They will do much more than use a computer; they will work with others as part of a creative team.

IT'S VALUED, RESPECTED, AND FLEXIBLE. They will enjoy challenging work in a well-respected field that pays well and often offers flexible hours.

IT'S EVERYWHERE. Most two- and four-year colleges offer programs in computing and related fields. Check out the programs nearest you, and start planning now.

IT'S FUN AND OPENS UP A WORLD OF POSSIBILITIES.



HOW CAN STUDENTS PREPARE NOW FOR A CAREER IN IT?

GET CREATIVE WITH COMPUTERS.

Explore computer programming apps, such as:

Scratch // www.scratch.mit.edu

Alice // www.alice.org

Khan Academy // www.khanacademy.org

Code Academy // www.codecademy.com

TAKE COMPUTER SCIENCE OR IT COURSES. If these classes are not offered at school, students may find them online or at a local community college.

KEEP TAKING MATH CLASSES, BUT CONSIDER OTHER "CS + X" PATHWAYS. Math skills are important in many jobs, but remember that Computer Science impacts many other areas, such as art, dance, music, and sports. Speak with individuals working in these different fields to better understand the connection.

JOIN AFTER-SCHOOL COMPUTING OR TECHNOLOGY CLUBS. Also, look for summer computing camps. (Check out The Connector (theconnector.org) or NCWIT AspireIT (aspirations.org/aspireit), for example.)

¹United States Bureau of Labor Statistics Occupational Outlook Handbook: Computer and Information Technology Occupations. <https://www.bls.gov/ooh/>

CS + X: COMPUTER SCIENCE IS EVERYWHERE!

Art and Design // Telecommunications // Business Operations // Education // Software Development // Medical Technology // National Security // Alternative Energy // Video Production // Automation and AI // Music Technology // Media Forensics // Game Design

What do these have in common? All depend on people with computing know-how to design and test useful products that satisfy real needs.

Worldwide, economists predict that the number of computing and information technology jobs will grow much faster than other fields over the next ten years.

Individuals with associate's, bachelor's, and graduate degrees in computing earn some of the highest starting salaries.

Plentiful, High-Paying Jobs in Every Industry...

Which Computing Pathway IS RIGHT FOR ME?

DO YOU WANT TO HELP BUILD THE NEXT GENERATION OF SMART PHONES, INTERACTIVE ROBOTS, MEDICAL TECHNOLOGY, OR WEARABLE TECHNOLOGY?

COMPUTER ENGINEERING (CE) professionals design digital hardware and software, such as wearable computers, smart phones, digital players, internet alarm systems, high-tech body scanners, and even laser surgical tools. CE specialists also integrate hardware and software to improve existing technologies.

WOULD YOU LIKE TO INVENT APPS AND SOFTWARE THAT HELP SOLVE REAL-WORLD PROBLEMS?

COMPUTER SCIENCE (CS) professionals create software for a broad range of human needs and problems. They design the software in medical technology, mobile devices, social networking sites, financial systems, forensic-analysis tools, and much more. CS is the foundation for many different computing careers.

ARE YOU THE ONE EVERYONE CALLS WHEN THEY WANT THEIR OWN WEBSITE OR WHEN THEIR COMPUTER ACTS WONKY?

INFORMATION TECHNOLOGY (IT) professionals support, troubleshoot, and design elements of the IT infrastructure — from websites to networks — in all kinds of organizations, businesses, government entities, schools, hospitals, and more. IT specialists combine technical knowledge and practical, hands-on expertise to support an organization's technology and the people who use it.

DO YOU SEE THE BIG PICTURE FROM NEED TO SOLUTION?

SOFTWARE ENGINEERS (SE) see the whole picture too, identifying user needs, meeting customers' budgets, and designing and testing usable software. SE specialists use communication skills to interface between customers and programmers. Software engineering courses are offered both within Computer Science and computer engineering programs and as separate degrees.

ARE YOU INTERESTED IN UNDERSTANDING HOW COMPUTERS CAN MAKE BUSINESSES WORK BETTER?

INFORMATION SYSTEMS (IS) specialists design and manage computing systems that help large and small organizations achieve their goals. IS professionals combine business and computing knowledge with communication skills to build technical systems that work. Most IS programs are found in business schools.

DO YOU HAVE A KEEN ATTENTION TO DETAIL? CAN YOU TELL A GOOD STORY? ARE YOU CURIOUS ABOUT HOW PEOPLE INTERFACE WITH AN APP, A SYSTEM, OR A PRODUCT?

USER EXPERIENCE (UX) careers involve the science of exploring human-computer interaction, examining how people (users) experience technology. UX careers are among the fastest-growing and most exciting occupations in the industry. There are several pathways of UX opportunities, but the most common jobs are UX researchers and UX designers. UX researchers analyze the behavior, needs, and patterns of users to ensure that customers are having a positive experience. UX designers are involved in the creation and design of products to make sure they're accessible and user-friendly.

DO YOU LIKE A GOOD CHALLENGE AND WANT TO HELP COMPANIES, SCHOOLS, AND THE GOVERNMENT KEEP THEIR INFORMATION SAFE?

CYBERSECURITY professionals, or information security analysts, plan and develop measures to protect an organization's computer networks and systems. A cybersecurity analyst's primary responsibility is to thwart hackers from stealing important online data and information through cyberattacks and to ultimately protect our privacy.

Cybersecurity career pathways are diverse, and jobs in this field can be found everywhere, including the retail/fashion industry, corporations, non-profit organizations, educational institutions, the military, and government organizations.



View this resource in Spanish at:
https://bit.ly/QueCamino_2023.

Partnership for Advancing Computing Education (PACE)



Find out more at <https://jobs.acm.org>.

COMMUNITY COLLEGE PATHWAY TO IT AND COMPUTING CAREERS

ARE ANY OF THESE TRUE FOR YOU?

Are you somebody who...

- enjoys finding better ways to get things done and wonders how you might use that in a job?
- is interested in understanding how technology can help solve some of the world's most pressing problems?
- wants a good job with good pay, soon?
- is interested in staying local?
- is looking for an affordable start to your college education?

Then you might want to enroll in a community college.

By enrolling in a two-year college you can pursue these IT and computing career paths:

- **Industry-recognized certifications** can qualify you for good jobs in a short period of time.
- **A two-year associate's degree** prepares you for computer programming, network administration, computer support, web design, health care information, and other technical jobs.
- **Transfer to a four-year college or university** enables you to work toward a bachelor's degree in Computer Science. If this is your plan, be sure to take community college coursework will transfer.



For more free resources, visit www.ncwit.org/C4C.

JOBS ARE AVAILABLE...

IT and computing jobs make up one of the fastest-growing sectors in the U.S economy, with a projected growth rate of **15%** for the 2021-31 decade—well above the average for all occupations. Demand for computing professionals is expected to continue increasing over the long term.

...AND PAY WELL.

Salaries in IT and computing are high and can take less time to achieve than those in other sectors. The median annual wage for IT and computing professions was \$97,430 in May 2021, compared to \$45,760 for all occupations.

GET STARTED NOW!

1. Take math, IT, and Computer Science classes.
2. Look for extracurricular computing activities.
3. Do research and meet with advisors at two-year colleges.
 - Ask about certification programs recognized by local technology companies.
 - Learn which courses apply to a four-year degree or major (if you plan to transfer).
4. Apply for admission to community college.
5. Develop a program plan with a faculty member or academic advisor for the degree you're considering.

WITH A TWO-YEAR DEGREE OR TECHNICAL CERTIFICATE...

Sample Job Titles	Projected Growth 2021-2031	2022 Average Annual Wage	2022 Average Hourly Wage
Computer User Support Specialist	6%	\$61,580	\$29.61
Computer Network Support Specialist	6%	\$76,060	\$36.57
Sound Engineering Technician	10%	\$75,590	\$36.34
Health Information Technologist	17%	\$65,280	\$31.38
Aerospace Engineering and Operations	6%	\$68,340	\$32.86

WITH A FOUR-YEAR OR ADVANCED COMPUTER SCIENCE DEGREE...

Sample Job Titles	Projected Growth 2021-2031	2022 Average Annual Wage	2022 Average Hourly Wage
Database Administrator	9%	\$110,400	\$49.65
Network & Computer Systems Administrator	3%	\$97,160	\$43.52
Web Developers	23%	\$87,580	\$37.78
Software Developer, Quality Assurance Analysts, and Testers	25%	\$124,940	\$54.90
Information Security Analyst	35%	\$119,860	\$53.85
Computer Systems Analyst	9%	\$107,530	\$49.15
Computer and Information Systems Manager	16%	\$173,670	\$78.88



Cybersecurity workers are key to keeping us safe.

SOURCES:

U.S. Department of Labor, Occupational Projections 2021-2031, www.bls.gov/emp
 U.S. Department of Labor, Occupational Outlook Handbook 2022 Edition, www.bls.gov/oon
 O*NET Online, Rapid Growth Occupations 2021-2031, www.onetonline.org
 American Association of Community Colleges, www.aacc.nche.edu

MILITARY PATHWAY TO IT AND COMPUTING CAREERS

ARE ANY OF THESE TRUE FOR YOU?

Are you somebody who...

- Wants to serve your country?
- Is looking for on-the-job training?
- Is interested in learning and creating technologies that can make your country safer?
- Wants to pursue further education or needs financial help to go to college?

You might want to join the military and apply for an information technology (IT) assignment.



For more free resources, visit www.ncwit.org/C4C.

POSITIVE OUTLOOK CONTINUES FOR MILITARY JOBS

Protecting our cyber infrastructure is a top priority for the Department of Defense, as we depend on cyberspace for nearly every civilian and military function. As the need for skilled cyber and IT experts in the military continues to grow, job outlooks remain strong.

MILITARY IT ASSIGNMENTS LEAD TO QUALITY CIVILIAN JOBS



Information technology specialists in the military learn to develop software and design and maintain computer systems that support our national security. These assignments can lead to jobs right out of service or make you ready for college degree programs that result in good jobs.

TECHNICAL JOBS ARE GROWING

Civilian technology jobs are among the fastest growing jobs in the U.S.; they are expected to increase by **15%** between 2021-2031. Jobs in the tech sector are stable, rewarding, and flexible.

GET STARTED NOW!

1. Take math, IT, and Computer Science classes.
2. Look for extracurricular computing or technology activities.
3. Graduate from high school.
4. Meet enlistment requirements: www.todaysmilitary.com.
5. Learn about IT assignments in different branches of the military through the Armed Services Vocational Aptitude Battery (ASVAB) Career Exploration Program: www.asvabprogram.com.
6. Ask the recruiter for the branch you choose to assess your chances of being accepted for training in IT occupations and take the ASVAB aptitude exam to see how well you score.
7. Specify an IT assignment in your military contract.

Enlisted Careers	Average Military Salary	Service Branches
Cyber Security Specialists  Cybersecurity workers are key to keeping us safe.	\$81,108	U.S. Army, Marines, Navy, U.S. Air Force, Space Force
Cyber-Operations Specialists	\$81,108	U.S. Army, Marines, Navy, U.S. Air Force, Space Force
Network and Database Administrators	\$62,503	U.S. Army, Marines, Navy, U.S. Air Force, Coast Guard
Officer Careers	Average Military Salary	Service Branches
Cyber Security Officers  Cybersecurity workers are key to keeping us safe.	\$85,304	US Army, Navy
Cyber Warfare Officers	\$82,287	Marines, Air Force, Space Force
Cyber-Operations Officers	\$86,625	Army, Marines, Navy, Air Force
IT Managers	\$85,680	U.S. Army, Marines, Navy, Coast Guard
Programmers and Developers	\$77,641	Marines, Navy

DoD STEM offers educational programs, internships, and scholarships for students and many career development opportunities for educators. To learn more about DoD STEM opportunities, visit www.dodstem.us.



SOURCES:

U.S. Department of Labor, Occupational Outlook Handbook, 2022 Edition, www.bls.gov/ooh

U.S. Department of Defense, 2023, <http://www.todaysmilitary.com/careers-benefits/career-fields/cybersecurity-and-information-technology>

UNIVERSITY PATHWAY TO IT AND COMPUTING CAREERS

ARE ANY OF THESE TRUE FOR YOU?

Are you someone who...

- enjoys solving puzzles or logic problems?
- is good at breaking big problems into smaller parts?
- is interested in understanding how computers can help solve some of the world's most pressing problems?
- likes finding better and faster ways to get things done?
- wants to help build the next generation of smart phones, 3D virtual reality environments, or high-tech clothing?

You might want to enroll in a university or four-year college and get a degree in computing!



For more free resources, visit www.ncwit.org/C4C.

IT AND COMPUTING JOBS ARE PLENTIFUL...

IT and computing jobs are growing fast and opportunities for computer science degree holders are especially abundant. Employment in technology is likely to grow by **15%** between 2021 and 2031, much faster than the average for all occupations. Software development is the largest subfield, and is expected to see the third-largest increase in jobs of any occupation over the 2021-31 decade.

...AND THEY PAY WELL.

The average starting salary offered to Computer Science graduates is \$72,843 in 2023, according to the National Association of Colleges and Employers.

Want in? A college degree in a computing major will make it happen. Read on to see how your interests line up with different degrees and careers in computing.

GET STARTED NOW!

1. Take math, IT, and Computer Science classes.
2. Look for extracurricular computing activities.
3. Talk with your school counselor and Computer Science teacher about your interests and let them advise you.
4. Do research: meet with advisors at colleges and universities.
5. Apply at the universities or colleges with programs that suit your interests.

Degree Programs	Some Job Titles Include	Projected Growth 2021-2031	2022 Average Annual Wage	2022 Average Hourly Wage
COMPUTER SCIENCE and ENGINEERING (CSE) professionals design and build software. They design, define, and organize many aspects of a complex software product. CSE is a foundation for many different computing careers.	Computer and Information Research Scientist	21%	\$155,880	\$74.94
	Software Developer	25%	\$132,930	\$62.91
	Information Security Analyst	35%	\$119,860	\$57.63
INFORMATION SYSTEMS (IS) specialists design and manage computing systems that help organizations achieve their goals. Most IS programs are found in business schools.	Computer and Information Systems Manager	16%	\$173,670	\$83.49
	Computer Systems Analyst	9%	\$107,530	\$51.70
INFORMATION TECHNOLOGY (IT) professionals support, troubleshoot, and design elements of the IT infrastructure (websites to networks) in organizations including businesses, government, schools, health care, and more.	Database Administrator	9%	\$110,400	\$49.29
	Web Developer	23%	\$87,580	\$42.11
	Network and Computer Systems Administrator	3%	\$97,160	\$46.71
	Computer Network Architect	4%	\$129,490	\$62.25



Cybersecurity workers are key to keeping us safe.

SOURCES:

U.S. Department of Labor, Occupational Outlook Handbook, 2022 Edition, www.bls.gov/ooh
 ACM Computing Careers Website, <https://jobs.acm.org>
 National Association of Colleges and Employers, Winter 2023 Salary Survey, www.nacweb.org
 U.S. Department of Labor, Occupational Projections 2021-2031, <http://www.bls.gov/emp>

TOP 10 WAYS

NOT A SCHOOL COUNSELOR?

Read these tips to engage school counselors as allies in the effort to increase student access to Computer Science education and careers.

School counselors are eager to direct students to viable education and career opportunities. Consider these key points for collaboration as you plan to meet with counselors to discuss ways their professional responsibilities align with your goals to increase student access to computing.

1

“DEMYSTIFY” CS

Counselors guide students to your courses when they understand what Computer Science is and what the courses are like.

TIP: Meet with counselors and share an introductory lesson from your curriculum or an “unplugged” activity so they experience computational thinking first hand.

TIP: The beauty of CS is that it is project-based and results in artifacts of learning that can be shared. Send students to the counseling center to share their projects and excitement about CS.



2

“REPOSITION” COMPUTING AND COMPUTING JOBS

CS isn’t just for students who will pursue computing after high school. The computational thinking that underpins CS is fundamental to success in many fields, and in life!

TIP: Share the Google-sponsored Careers with Code magazine, which presents many interesting expressions of computing across disciplines and fields.

3

HELP COUNSELORS AND STUDENTS SEE THAT TECH JOBS ARE EVERYWHERE

Counselors direct students to viable job opportunities, but may think that computing professionals only work in Silicon Valley or in tech hubs in big cities.

TIP: Explain that computing underpins modern innovation in fields students care about, such as healthcare and digital arts, and that the majority of tech jobs are outside the tech sector.

4

EXAMINE THE MASTER SCHEDULE FOR UNINTENDED OBSTACLES

Counselors can shape the school’s master schedule to make it amenable to student participation in CS.

TIP: Are students unable to enroll in CS because of a course scheduling conflict? With your counselor, identify and resolve systemic barriers that affect who takes CS. Lay the foundation for a year-to-year course progression that provides students with comprehensive and sustained experiences in computing.

5

USE DATA TO TRACK WHO TAKES CS AND SET GOALS FOR BROADENING PARTICIPATION

Counselors can contribute to setting and accomplishing class composition goals. The composition of your class should be as diverse as English or social studies classes.

TIP: Examine school data to evaluate Computer Science enrollment patterns. Set shared goals for changing the composition of CS classes so they are representative of the student body.

6**PRESENT CS AS A WAY TO ACHIEVE MORE EQUITABLE OUTCOMES FOR ALL STUDENTS**

Counselors care about equity and social justice and are motivated to guide students to studies that prepare them for quality jobs. Partner with counselors to advocate for all students to have access to CS.

TIP: Share data around the underrepresentation of women and other groups in computing. Ask counselors what you might do together to change the equation.

7**PAINT A FRESH PICTURE OF WHO “DOES COMPUTING”**

As with the general public, counselors may have a narrow sense of who is “right” for computing.

TIP: Have an excited student drop by the counseling center and share what she created with CS. Tell her to say what she likes about studying Computer Science.

**8****RECRUIT STRATEGICALLY**

It’s hard to be in the minority, especially when you’re a teen or preteen. Students from traditionally underrepresented groups feel a greater sense of belonging if people like them are in class.

TIP: Together with counselors, actively recruit students of shared backgrounds or interest. Suggest they recruit in groups, for instance, from the girls soccer team.

9**INTRODUCE PEOPLE WHO DO THE WORK**

Counselors meet with students for grade-specific career development each year.

TIP: Help counselors show students what their future may hold by presenting them with engaging and diverse role models. They can invite computing professionals, school alumni studying CS, or NCWIT Aspirations winners to the school career fair or plan for a class visit.

10**INFUSE COMPUTING INTO EXISTING ACTIVITIES IN THE SCHOOL CALENDAR**

Counselors plan school-wide events into which CS can be infused. How might CS connect to Drug and Alcohol Awareness Week, Kindness Campaigns, Field, Spirit or Mix-It-Up-at-Lunch days?

TIP: You don’t have to do it alone. Strategize with your school counselor about incorporating CS themes into the school’s events calendar. While you’re at it, invite your school counselor on CS-related field trips.

**RELATED RESOURCES**

Download these resources for use with your counselor colleagues:

Top 10 Ways to Engage Underrepresented Students in Computing // www.ncwit.org/top10engagestudents

Top 10 Ways of Recruiting High School Women into Your Computing Classes // www.ncwit.org/top10recruithighschool

Computing: Get the Most from Your College Degree // www.ncwit.org/csqualityoflife



WHAT CAN YOU DO NEXT?

CHECK OUT WHAT OTHER COUNSELORS HAVE DONE

1 CHECK THE MASTER SCHEDULE FOR INHERENT CONFLICTS THAT PREVENT GROUPS OF STUDENTS FROM TAKING COMPUTING CLASSES:

"I set about identifying the changes that I could influence from my position. It became evident that the overarching themes were equity and access to classes that could have an impact on post-secondary plans. By looking at class enrollment data, we made intentional changes to the master schedule, dropped out-dated prerequisites, and monitored for our implicit bias."

- Jennifer C., Director of School Counseling, NJ

2 HOST AN EVENT THAT INSPIRES STUDENTS:

"I partnered with my local university to roll out a CSPdWeek program. I took all of the resources that I had been introduced to by C4C and began to integrate them into my school setting. This year, we celebrated CSEdWeek with an Hour of Code Fair. There were plenty of CS guests who came to share: CodeVA, VSU Computer Science Department, SCHS Robotics Team, SCHS Programming Class, and a host of volunteers."

- Drexel W. P. Jr., School Counselor, VA

3 START AN AFTERSCHOOL CLUB:

"I started a CyberPatriots club with learners new to the field of cybersecurity, and our club quickly became a family. My students didn't have local role models in cybersecurity who look like them. They decided that they not only wanted to learn about the field, but they also would become mentors for the younger students who would benefit from seeing diverse role models across intersections of race and gender identity who also came from difficult economic/ social backgrounds. Initially, my students were curious about and excited to learn more about cybersecurity. They ultimately became champions of Computer Science (CS) and created a community of support. Their "Can-Do" attitude ignites interest in cybersecurity and demonstrates that CS is for ALL students."

- Sean M., School Counselor, GA

4 SHARE CONTENT THAT GIVES STUDENTS NEW ROLE MODELS:

"I loved Superman as a kid, but when I dressed as him one Halloween, I was told I could not be Superman because I didn't look like him. It broke my heart because before then, I never imagined I could not be Superman because of my color. As I got older, I realized that it is important for students to be able to see a reflection of themselves in their heroes. That way, they can visualize themselves being in that role one day. TECHNOLOchicas are Hispanic and Latinx heroes! Their visibility is a confirmation to my young women that they too can have a voice and make important contributions in STEAM, specifically CS! They too can be heroes!!!"

- Shannon G., Science Teacher, MD

5 TELL STUDENTS ABOUT HOW COMPUTING CAN BE COMBINED WITH OTHER FIELDS OF INTEREST:

"I talked to my freshman students during a career management lesson about the various ways they could incorporate a CS-related degree to the career option they were initially interested in. Many students were surprised by all the "extra" options available (by) adding CS."

- Jill V., School Counselor, ND

6 USE VR HEADSETS IN COMBINATION WITH GOOGLE EXPEDITIONS OR OTHER EDUCATIONAL CONTENT:

"I have a few VR headsets that I leave in our counseling office in the waiting area. Students and parents are naturally inclined to pick it up and try it. I have a set of directions right by it with a sign that says, 'YES, try this while you wait to see a counselor.' As always, most students don't need much help navigating the VR headset or tools. It gives me an easy segue into conversation with students that is different than the typical, 'How is your day going?' And, it's a great way to discuss all the pathways to Computer Science education."

- Andreanna M., Lead High School Counselor, CA

OTHER IDEAS

1. Invite older high school students who are currently taking CS to speak with elementary and middle school students. Invite grads or students from the local college majoring in CS to come back and talk to current students.
2. Host an in-person or virtual "Meet the Pros" lunch where students hear from a professional while they eat. Tap into TECHNOLOchicas (<https://technolochicas.org/>) for a video database of Latinas succeeding in their technology-related fields as a way to inspire and motivate students.
3. Ask students, "What problems do you want to solve?" and engage in a CS + X conversation. Watch this short video from Jaime Casap: <https://www.ncwit.org/JaimeCasapShort>. Or, view his full TEDx talk: <https://www.ncwit.org/JaimeCasapTED>.
4. Reach out to NCWIT for even more ideas. For example, this "Celebrating CSEdWeek 2020" document compiles free resources and easy-to-implement activities that you can use to generate excitement and increase participation in CSEdWeek at your school: <https://www.ncwit.org/CSEdWeek2020resource>.

ADDITIONAL RESOURCES



ASPIRATIONS
IN COMPUTING

ASPIRATIONS IN COMPUTING (AiC)

The NCWIT Aspirations in Computing (AiC) program honors students and educators for their profound efforts to revolutionize the face of technology. The Award for AiC honors 9th-12th grade students who self-identify as women, genderqueer, or non-binary for their computing-related achievements and interests; and, the AiC Educator Award identifies exemplary formal and informal educators who play a pivotal role in encouraging their students to explore their interests in computing. Learn how to apply and spread the word about AiC Recognitions: www.aspirations.org/AiCAwardRecognitions.



MODERN FIGURES PODCAST

Modern Figures Podcast guest stars Black women in computing who share their stories and perspectives on technical, societal, and personal topics. Geared toward women of color in STEM, especially high school and college students, the podcast also highlights the interestingly relatable, pivotal moments along their journey in computing. Find out more at modernfigurespodcast.com.



TECHNOLOCHICAS

TECHNOLOchicas is a national initiative co-produced by NCWIT and Televisa Foundation, that speaks to young Latinas and their families, raising awareness about opportunities and careers in technology. Ambassadors from diverse backgrounds share their technology career experiences, turning broadcast television, local events, social media, and online videos into tools of inspiration. In speaking engagements, workshop volunteering, interviews, and outreach, TECHNOLOchicas' powerful stereotype-shattering encounters inspire young women to chart their own trajectories. Learn more at technolochicas.org.



NCWIT RESOURCES

For more NCWIT resources that you can use to support ALL students as they explore Computer Science education and careers, visit www.ncwit.org/C4Cmaterials.

C4C is a project of the NCWIT K-12 Alliance, made possible by Apple, the Merck Company Foundation, DoD STEM, Google, Palo Alto Networks, and the Cognizant U.S. Foundation.



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