

The Importance of Teaching Computer Science in High School

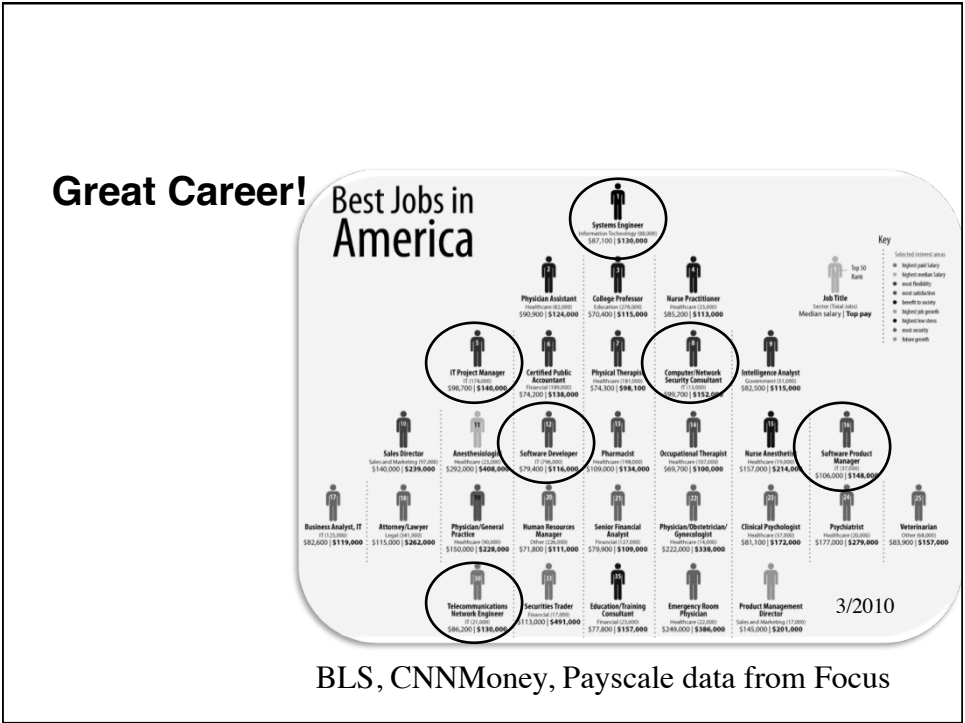
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WHY SHOULD STUDENTS STUDY COMPUTER SCIENCE (CS)?

Flexible, creative, rewarding careers
Unmet workforce need



Three of the top ten occupations are computing

- ◆ **Systems Engineer**  Manage large complex projects
- ◆ **IT Project Manager**  Plan, organize, and oversee the team on a computing project
- ◆ **Network Security Consultant**  Protect important computer systems from infiltration

Source: CNNMoney.com, Best Jobs in America

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Computing offers exciting work that affects our world and the people in it



Create technology for
















- Tracking endangered dolphins
- Mobile forensics labs for instant analysis at crime scenes
- GPS systems that guide blind people
- Scanning DNA for childhood diseases
- Designing and displaying new fashions

Source: dotdiva.org

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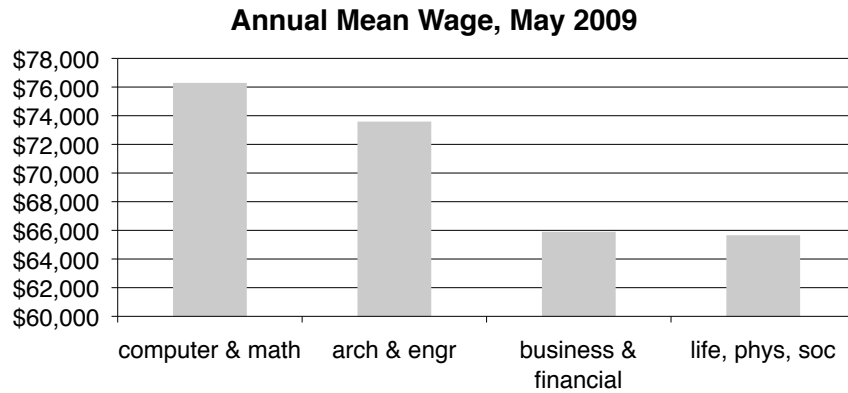
Computer Scientists work in every industry

Source: dotdiva.org

<p>I design how animated characters move on film.</p>  <p>Kendal Seger Animation/Film</p>	<p>I created a smartphone app for art museum visitors.</p>  <p>Juchena Edwards Art History/ Education</p>	<p>I develop computer simulations that increase our knowledge of nearby galaxies.</p>  <p>Gurina Desai Astronomy</p>
<p>I help bring high-speed Internet to disadvantaged communities around the world.</p>  <p>Clare Liggett Communications/ Internet Technology</p>	<p>I develop software for a cochlear implant that will help people who are deaf to hear.</p>  <p>Sahray Gambaro Disabilities</p>	<p>I create 3-D fashion design software.</p>  <p>Anamary Leal Fashion & Design/ Computer Graphics</p>
<p>I develop software that can design easy-to-build shelters for victims of disasters.</p>  <p>Claudia Cost Humanitarian & Disaster Relief</p>	<p>I research ways to fight cybercrime and identify theft.</p>  <p>Yvessa Shields Internet Technology/ Forensics</p>	<p>I developed a "virtual nurse" for hospital patients.</p>  <p>Laura Pfeifer Medicine</p>
<p>I work with artists and musicians to create software for music video games.</p>  <p>Mallard Lederer Music/Gaming</p>	<p>I helped develop a microfinance site that combats poverty.</p>  <p>Janella Talerino Poverty & Social Justice</p>	<p>I research how people in low-income communities use technology to address violence.</p>  <p>Sheena Lewis Public Safety/ Poverty</p>
<p>I develop digital body sensors that can save the lives of firefighters.</p>  <p>Mildán Amaro-Rivera Public Safety/ Medicine</p>	<p>I create musical robots that can play duets.</p>  <p>Jingica Lim Robotics/Music</p>	<p>I develop features for a mobile app that helps people meet up with friends.</p>  <p>Sibhan Dune Social Networking</p>

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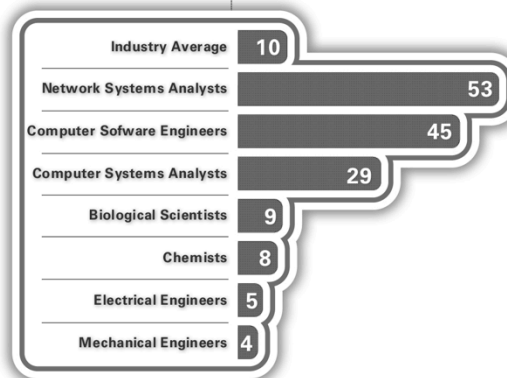
Computing occupations are well paid



Source: Bureau of Labor Statistics (BLS)

Computing is where the jobs are going to be

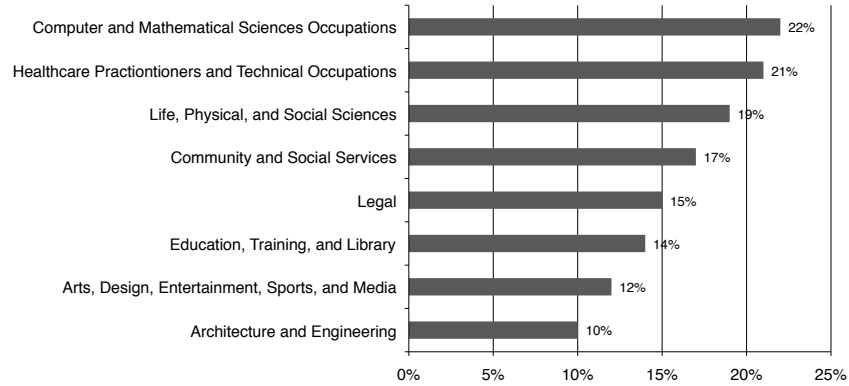
Projected Percent Change,
STEM Occupations 2006-2016



Source: Bureau of Labor Statistics, Monthly Labor Review, November 2007

More Job Growth Expected than any other Category of Professional Occupations

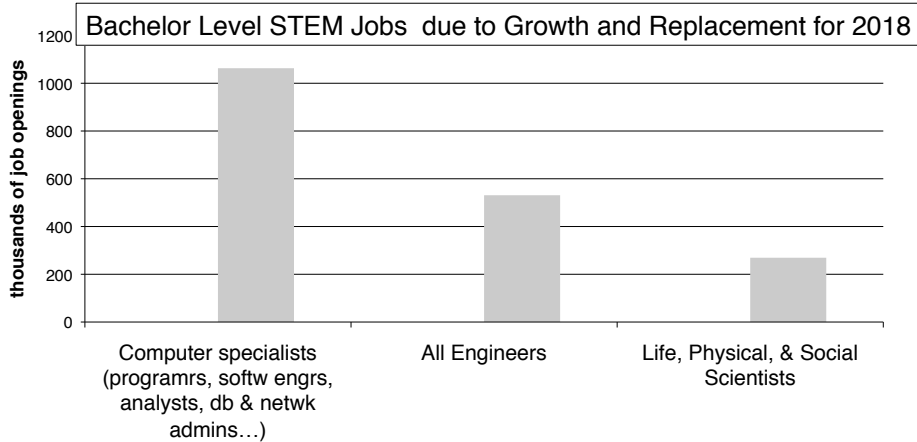
Predicted Job Growth, 2000-2018



NCWIT. Source: U.S. Department of Labor, Bureau of Labor Statistics

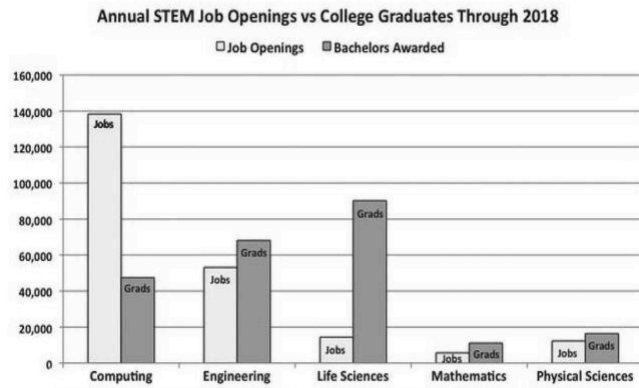
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CS outpaces other expected total job openings



Source: U.S. Bureau of Labor Statistics Employment Projections Table 1.6

Workforce needs could go unmet



**...unless
we attract
more
students**

Data Sources: US-BLS Employment Projections, 2008-2018 (http://www.bls.gov/emp/ep_table_102.pdf), National Science Foundation Division of Science Resource Statistics (<http://www.nsf.gov/statistics/nsf08321/tables/tab5.xls>), and National Center for Education Statistics (http://nces.ed.gov/programs/digest/d08/tables/dt08_286.asp).



WHY OFFER CS IN HIGH SCHOOL?

CS teaches vital 21st century skills

- ◆ Design, logical reasoning, and problem solving
- ◆ Creating and adapting, not just using, technology



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Colleges often expect familiarity

- ◆ Students are more likely to succeed in computing if they have positive early experiences



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Contribute to local economy



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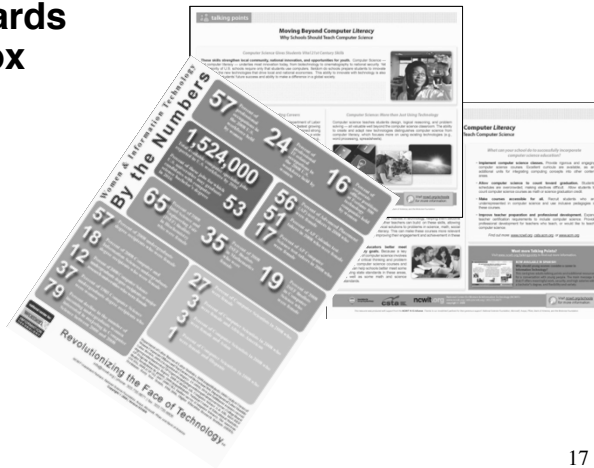
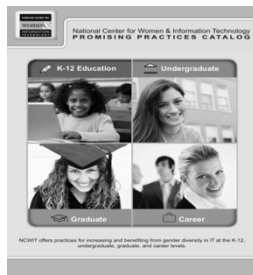


**SOURCES FOR MORE
INFORMATION**

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NCWIT has free resources for more information

Talking Points Cards
 Programs in a Box
 Practice Sheets
 Facts & Figures



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CSTA has free resources for more information

Additional Resources for Talking with Curriculum Decision Makers

Association for Computing Machinery (ACM)

ACM provides a variety of materials for working with educators and policymakers. www.casdwk.org

Computer Science Teachers Association (CSTA)

The CSTA Leadership Cohort consists of trained teacher leaders from each state who advocate for K-12 computer science education. More information on the Leadership Cohort, including contacts in each state, can be found at: <http://csta.acm.org/Advocacy/Outreach/sub/LeadershipCohort.html>

Make your case with local education and workforce data

While national data can be quite useful, it often is even more persuasive to have local data to back up your arguments. [Download a PDF copy of data NCWIT uses in Colorado.](#)

You can create a similar data set with local employment data from your State Department of Labor's website, and there is state-specific education data available at the National Center for Education Statistics website, or email us at datarequest@ncwit.org.

K-12 Curriculum Resources

Computer Science Teachers Association (CSTA)

CSTA provides the ACM Model Curriculum for K-12 Computer Science available at: <http://csta.acm.org/Curriculum/sub/ACMK12CSModel.html>

CSTA provides three levels of Objectives and Outcomes documents (Level 1, Level 2, Level 3) to support computer science learning available at: <http://csta.acm.org/Curriculum/sub/Implementation.html>

CSTA also endorses the "Exploring Computer Science" Curriculum for implementing a rigorous, college-prep course for juniors and seniors. The curriculum is available at: <http://csta.acm.org/Curriculum/sub/ExploringCS.html>

NCWIT

- "How Do You Introduce Computing in an Engaging Way?" series and its six accompanying case studies, www.ncwit.org/practices.
- NCWIT's Computer Science-in-a-Box: Unplug Your Curriculum offers a selection of activities designed for use with students ages 9 to 14, www.ncwit.org/unplugged. Additional activities and resources are also available at www.csunplugged.org.

Software Programs

- Scratch lets kids create 2D animations and games using drag-and-drop programming, www.scratch.mit.edu.
- Alice lets students create 3D movies and games, www.alice.org. Storytelling Alice is a programming environment with storytelling features designed for middle school students (particularly girls), www.alice.org/kelleher/storytelling/
- Python is open source software that works well as a first language, www.python.org.
- AgentSheets lets you develop agent-based games and situations; a free trial download is available, www.agentsheets.com. AgentSheets offers educators resources for incorporating AgentSheets in the classroom, www.agentsheets.com/education.

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Questions



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A collage of images featuring women in various technological and professional contexts. The top row shows a woman holding a globe, a woman pointing at a screen, and a woman looking at a screen with a grid of icons. The bottom row shows a smiling woman, a woman using a magnifying glass, and a close-up of a woman's face. The text "Revolutionizing the Face of Technology" and the logo for the National Center for Women & Information Technology are also present.

Revolutionizing the Face of Technology

national center for
women
INFORMATION
TECHNOLOGY