

K - 12

NCWIT
&
ALLIANCE

*Additional Computing
Resources for Educators*

Gotta have IT



→ The National Center for Women & Information Technology (NCWIT) K-12 Alliance presents a comprehensive list of resources to help you explore computing with your students, with activities to do this minute (virtual experiences on the web), next week (robotics kits), next season (camps and clubs) and beyond (career exploration).

EXPLORE COMPUTING

Outreach-in-a-Box: Discovering IT

Invite a computing professional to school. The National Center for Women & Information Technology offers *Outreach-in-a-Box: Discovering IT*, an outreach kit for computing professionals to use to introduce computing to youth in a school program. The program includes a hands-on inquiry lesson with a robotic car. Visit public affairs at your nearest university or technology company and invite a computing professional to visit your school. Next, introduce them to *Outreach-in-a-Box*, which makes outreach easy. www.ncwit.org/outreach

Computer Science-in-a-Box: Unplug Your Curriculum

Introduce fundamental building blocks of computer science, without using computers! Using this sampler from the popular “Computer Science Unplugged” books, teach students of all ages how computers work while addressing critical mathematics and science concepts such

as number systems, algorithms, and manipulating variables and logic. So unplug your computer, and get ready to explore computer science!

www.ncwit.org/unplugged

Computer Science Unplugged

Are your students ready for a deeper dive into computing? The *Unplugged* books and companion web videos provide a series of off-line activities designed to let people of all ages have fun exploring interesting ideas at the heart of computer science, without having to use a computer at all. Download in pdf format from Google Education: www.google.com/educators/activities/unpluggedTeachersDec2006.pdf Also visit Computer Science Unplugged <http://csunplugged.org>, where you will find free activity write-ups, videos, and links to other useful materials. *Computer Science Unplugged* books are available here: www.unplugged.canterbury.ac.nz

PROGRAMMING AND ROBOTICS

Pico Crickets and Super Crickets

Plug lights, motors, and sensors into a Cricket; then write computer programs to tell it how to spin, light up, play music, and move. Build little robots, animated rocking horses, automated gift boxes, and other personal animated toys. These websites show where to get Crickets, and offer project ideas, lesson plans, and more.

Pico Crickets: www.picocricket.com/index.html
Super Crickets: <http://handyboard.com/cricket>

Scratch

Download free Scratch software and start snapping together blocks to create stories, games, and animations you can share on the web. Scratch is designed to empower young people to express themselves fluently and creatively with new technologies.

<http://scratch.mit.edu>

LEGO® Mindstorms™

Design and program real robots. Create everything from a light-sensitive intruder alarm to a robotic rover that can follow a trail, move around obstacles, and even duck into dark corners.

<http://tinyurl.com/y5rcob>

Linechaserz Cars

These toy cars use optical sensors to “chase” lines you draw. Learn computing fundamentals as you explore how this robotic car functions. Investigate how light emitting diodes and infrared emitters/detectors work in concert, and discover the rules that govern the car’s behavior. Purchase yours at Amazon www.amazon.com/Line-Chaserz-Optical-Adventure-Cars/dp/B001S3UT3Q and follow the Activities Guide in *Outreach-in-a-Box: Discovering IT*.

www.ncwit.org/outreach

CREATIVE MEDIA AND COMPUTING

Craft Magazine

Use silver-coated thread and a microprocessor to create a custom light-up tank top. Embroider your skateboard, felt an iPod cocoon, stitch a robot, and more. *Craft* is the first project-based magazine dedicated to the world of out-there and edgy crafts. Get do-it-yourself advice from the 'zine or on the *Craft* website.

www.craftzine.com/magazine

Make Magazine

Make celebrates your right to tweak, hack, and bend any technology to your own will. Get do-it-yourself advice from the 'zine or on the *Make* website. www.makezine.com

Switch

A do-it-yourself webshow that combines design, fashion and technology. Watch designers at work and check out lots of projects in the Learning Library. <http://iheartswitch.com>

CAMPS AND CLUBS

DigiGirlz High Tech Camp

Microsoft’s DigiGirlz High Tech Camp offers girls the opportunity to experience firsthand what it is like to develop cutting-edge technology. Offered regionally across the U.S. to girls 13 years old and above. www.microsoft.com/about/diversity/programs/digigirlz/hightechcamp.aspx

Future Scientists and Engineers of America (FSEA)

For kids who want to start their own tech club, this national nonprofit organization supports after school technology clubs. www.fsea.org

Girls Go Tech

Girl Scouts of the USA offers camps and programs where girls can explore their interests in science, math and technology. www.girlsgotech.org

Operation SMART – Girls Incorporated®

Operation SMART is an after-school program designed to engage girls and young women in inquiry-based science, technology, engineering, and math through hands-on, minds-on experiences. www.girlsinc.org/about/programs/operation-smart.html

Sally Ride Science Camps

Science camps provide girls in grades 4–9 an opportunity to explore science, technology and engineering and to experience life on a college campus. www.sallyridecamps.com

CAREER EXPLORATION

A Day in the Life (video)

In 2-minute profiles, *A Day in the Life* shows the lives of recent graduates from University of Washington School of Computer Science & Engineering. Meet bright young women engaged in secure, highly collaborative, creative, diverse, challenging, and well-compensated work. These role models resonate with young people who might not otherwise consider computer science as a profession. www.cs.washington.edu/WhyCSE

Power to Change the World (video)

University of Washington Computer Science & Engineering undergraduate students, graduate students, alumnae, and faculty explain why they

chose computer science as their field and demonstrate that it is exciting, diverse, and full of opportunities. www.cs.washington.edu/WhyCSE

Career Ideas for Kids Who Like Computers (book)

Take a quiz and learn if your future lies in the high-tech world of computers. *Career Ideas for Kids Who Like Computers* gives the scoop on exciting careers including Artificial Intelligence, Computer Game Design, Computer Programming, Hardware Engineering, Multimedia, and more. <http://tinyurl.com/cstg79>

CAREER EXPLORATION *(continued)*

Girls and Information Technology (fact sheet) – Girls Incorporated®

Do you know what proportion of girls and young women are preparing for careers requiring computer science skills? Learn this and other key information from the Girls Incorporated® *Girls and Information Technology Fact Sheet*.

www.girlsinc.org/downloads/GirlsandIT.pdf

You Can Be Anything (video and lesson plan) – Center for Women & Information Technology

“You Can Be Anything” uses the power of media to give young people, particularly girls and young women, a positive impression of the

career opportunities available in information technology (IT) and science-related fields where technology plays a major role. The lesson plan is focused on encouraging middle- and high-school girls and community college women to move beyond being just consumers or users of IT to fully participating in all aspects of information technology. www.umbc.edu/cwit/video.html

What Do You Like? Exploring Career Information – Bureau of Labor Statistics (BLS)

The BLS site lets kids scout out careers in every field—including technical ones. www.bls.gov/k12

CHALLENGES AND COMPETITIONS

Best Robots, Inc.

Boosting Engineering, Science, and Technology (BEST) is a national nonprofit organization that engages teams of middle- and high-school students in fun, high-energy engineering problem-solving competitions that involve designing and building remote-controlled robots. www.bestinc.org

Discovery Youth Scientist Challenge

Winners of local middle-school science fair competitions are eligible to compete in the Discovery and 3M Young Scientist Challenge. This science contest is especially for students in grades 5–8. The Young Scientist website provides all the information you need to participate.

www.youngscientistchallenge.com

FIRST Lego League (FLL)

FLL involves teams of students ages 9 to 14 in creating robots (using Lego Mindstorms™ technology) within a hands-on, minds-on, sport-like atmosphere. www.usfirst.org/what/fll

FIRST Robotics Competition (FRC)

FRC is a unique varsity sport of the mind designed to help high-school-aged young people discover how interesting and rewarding the life of engineers and researchers can be.

www.usfirst.org/what/frc

Robotic Technology and Engineering Challenge

From the Society of Manufacturing Engineers, this competition for students from middle school through university enhances students' understanding of manufacturing processes. The contest offers an innovative way for students to apply classroom knowledge to real world situations.

www.nationalroboticschallenge.org

Sally Ride Science Toy Challenge

Inventing toys is a great way to learn about science, engineering, and the design process. Teams who accept astronaut Sally Ride's Toy Challenge might just win a weekend VIP tour of NASA's Kennedy Space Center in Florida!

www.toychallenge.com

USA Computing Olympiad

The USACO holds six Internet Contests during the academic-year, and in the late Spring conducts the US Open, a proctored exam. Based on the results of these contests, over 15 USA students and a handful of the best international students are invited (expenses-paid) to the USA Invitational Computing Olympiad for a week of fierce competition, activities, and fellowship. The USAICO results are used to determine the four members of the USA Team who represent the USA at the International Olympiad in Informatics (IOI), held annually at exotic locations around the world. www.uwp.edu/sws/usaco