

A blurred background image showing several children, both boys and girls, sitting at desks and working on laptops. The scene is brightly lit and suggests a classroom or library setting.

Girls Can Code – It is Never Too Early to Start the Conversation

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20th Century Tomboy



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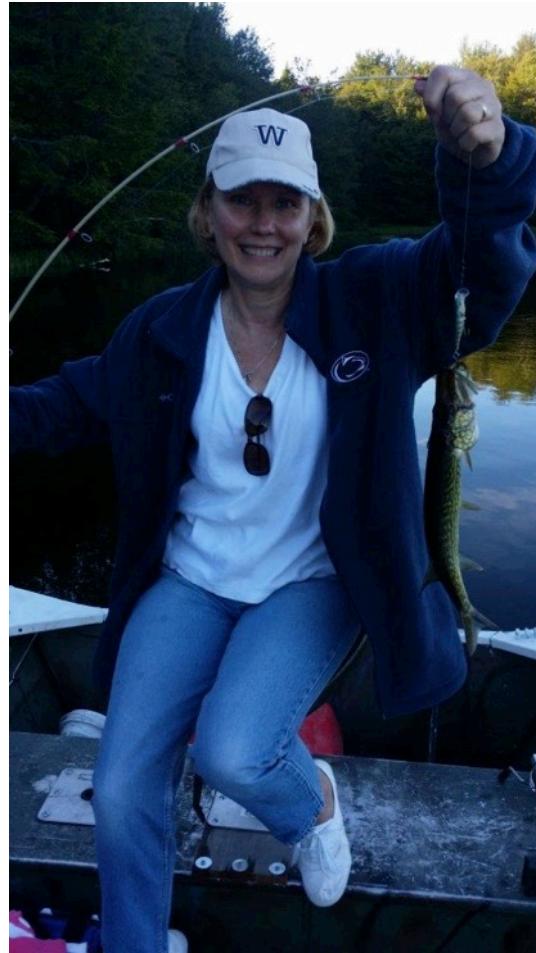
20th Century Tomboy



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The Tomboy

John George Brown (1873)

20th Century Gender Neutral Culture



20th Century Gender Neutral Culture



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20th Century Gender Neutral Culture



Today's Challenge

- US expects 1.4 million computing related job openings from 2010-2022
 - Only 32% of these jobs can be filled by US computing graduates

Today's Challenge

- Men significantly outnumber women in STEM majors and careers
- Women represented
 - 48% of the overall US workforce,
 - 24% of jobs in STEM
- Women represented
 - 12% of the engineering workforce
 - 26% of the computing workforce

Today's Challenge

- Women received 60% of all bachelor degrees
 - 20% of the engineering Bachelors,
 - 24% of Masters,
 - 23% of PhD
- Recruiter face difficulties finding qualified female candidates for entry level STEM jobs
- Pre-pipeline issues traces back to the classroom
 - As far back as the elementary school classroom

Must Understand to Reverse

Factors that disconnect
and discourage women
from pursuing STEM
degrees



- ① Girls can't do math
- ② Girls are not interested in technology subjects
- ③ Girls can only succeed in STEM curriculum if it is watered-down
- ④ Girls are not impacted by parents with respect to the girls' interests and career choices



① Girls & Math

- 8th grade girls scored higher than boys on tests:
 - technology and engineering
 - information and communication technology



① Girls & Math

- High school boys more likely than girls to enroll in:
 - Advanced Placement Calculus
 - Advanced Placement Statistics
 - Advanced Placement Physics



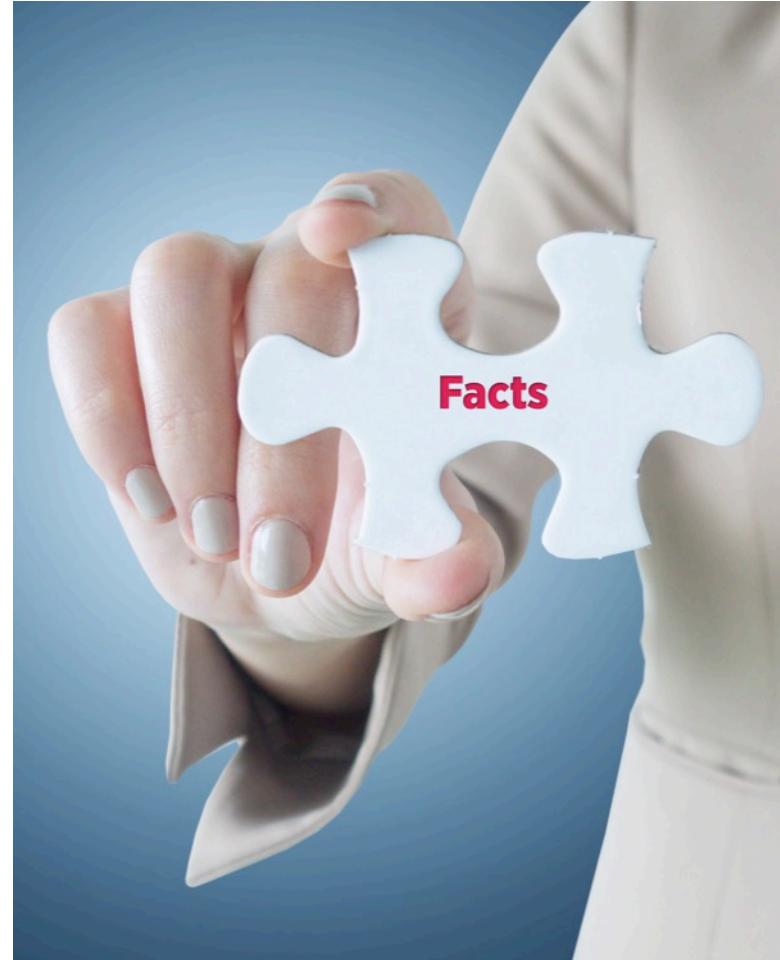
② Girls & Interest

- 3rd and 4th grade girls are likely to say they want to be
 - Astronauts
 - Engineers
 - Scientists
 - Biologist



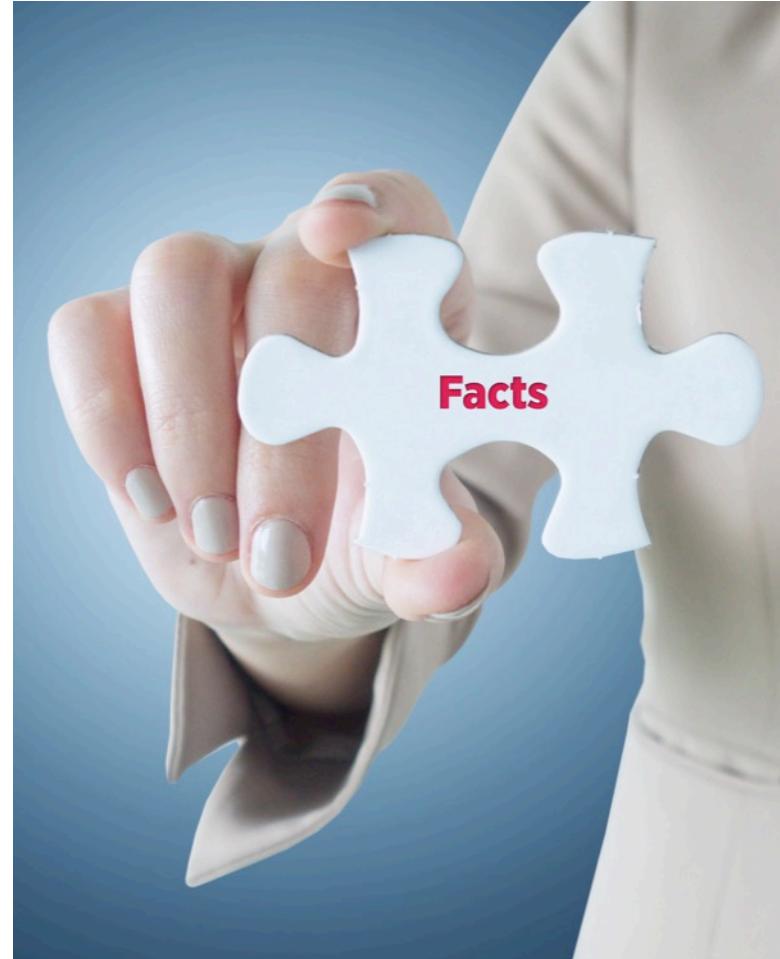
② Girls & Interest

- 60% of the girls interested in STEM
 - Know more about other careers than they do about STEM careers
- 79% of the girls NOT interested in STEM
 - Know more about other careers than they do about STEM careers



② Girls & Interest

- Middle school girls loss performance, interest, engagement, and ambition.
- High school girls are supported to be good at
 - Social studies,
 - Life arts,
 - Humanities, and
 - Avoid STEM subjects



③ Girls & Capabilities

- Girls have the abilities and critical thinking skills to succeed in tech and engineering
- Girls who believed they had the abilities did better than those who did not



④ Girls & Parental Impact

- Parents are girls' primary roles models
- Need to consider the ways families influence girls
- Encouragement from family can foster and reinforce girls' interest in STEM



Who Are They...



Reading and Writing



Girls like reading and writing about adventure books

Social and Nurturing



Girls are interested in relationships with and feelings of others

Exploration and Discovery



Girls enjoy the hands-on aspect of exploration and discovery

Purpose and Meaningful



Girls want activities where there is a purpose or some social impact

Real and Relevant



Girls want activities
that are real,
contextual, and
relevant to their
everyday experiences

Women In STEM



PARENT'S INFLUENCE



PARENT'S INFLUENCE



FATHER POWER



How to Start Talking and Doing...



Hold High Expectations

- Encourage and expect daughter to:
 - Do well in STEM
 - Take on more than the minimally required coursework
- Show sincere confidence in your daughter's ability to succeed in STEM



Hold High Expectations

- Help your daughter learn to set personal STEM goals related to
 - effort,
 - performance,
 - participation, and
 - dispositions



Hold High Expectations

- Help your daughter know that STEM success is based on
 - Effort and appropriate experiences
 - NOT natural ability
- STEM subjects are understandable subjects that can be **figured out**



Hold High Expectations

- Praise effort and reasoning to a greater degree than correct answers



Hold High Expectations

- Ask your daughter to explain what she did in school that day
 - Have her tell at least one thing she learned
 - An activity she did, something she found confusing, or one thing she would like to learn more about
- Stay abreast of what homework your daughter has due and be sure she completes it



Build Positive Beliefs

- Help your daughter believe it is acceptable to like and be good at STEM
- Point out successful females in STEM
- Help your daughter see that female in STEM display a range of personal characteristics and interests



Source: NASA.gov

Build Positive Beliefs

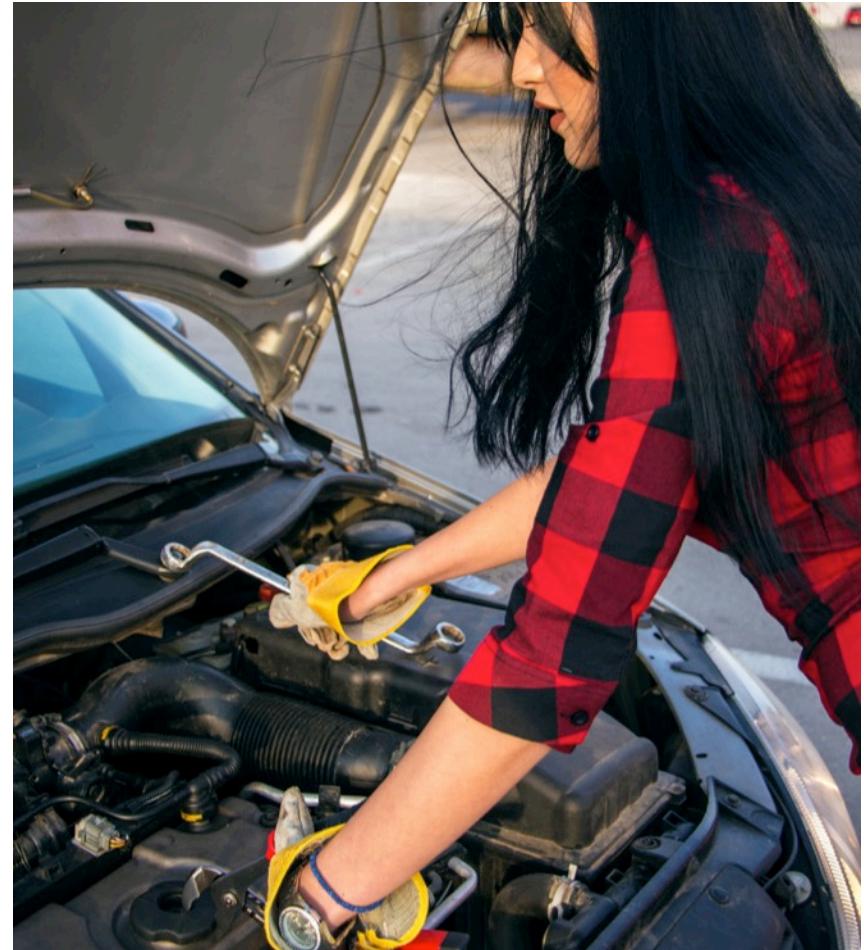
- Debbie Sterling introduced *GoldieBlox*
 - Designed to teach engineering concepts to young girls
 - Female students had less hands-on experience than male students
 - Tinkering, building, and creating 3D construction



Source: goldieblox.com

Build Positive Beliefs

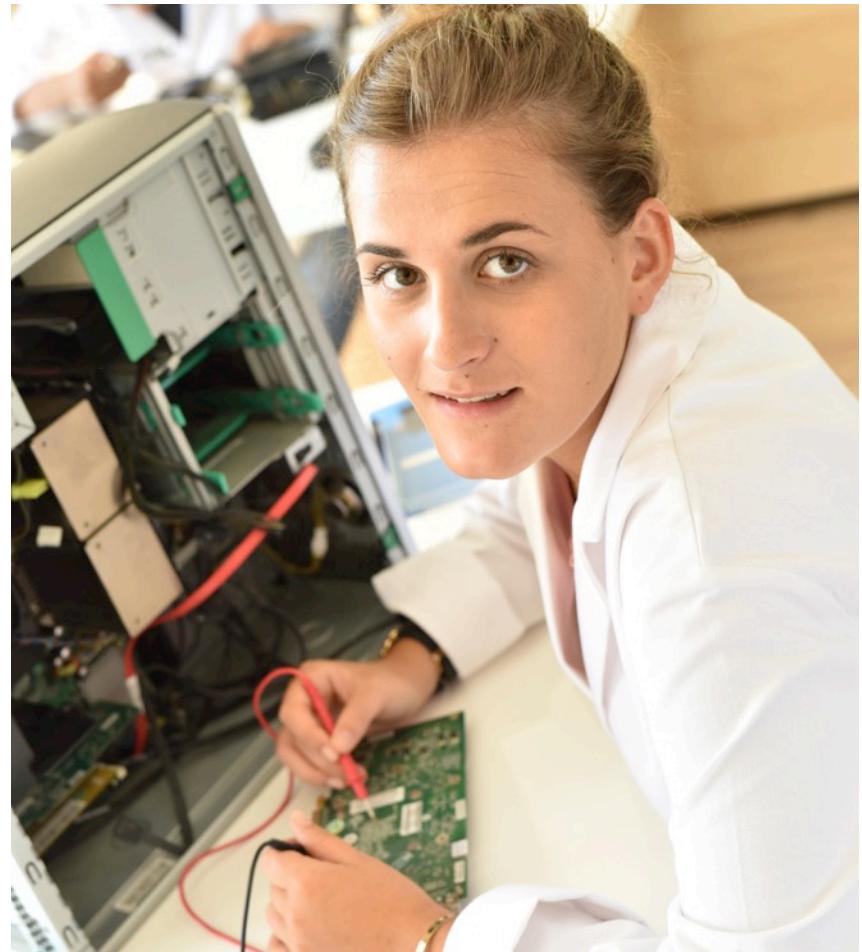
- Tell your daughter that STEM subject matter is important and useful in school, work, and everyday life



Source: NASA.gov

Build Positive Beliefs

- Avoid conveying negative and counterproductive messages toward STEM
 - If a parent needs help tends to seek help from male instead of female figures
 - Use gender-neutral language when mentioning STEM professionals, use *they* not *him*
- Choose stories, posters, and films can portray appropriate female role models in STEM



Failure is First Step in Success

- Your daughter must understand she is going to make mistakes and fail.
 - Part of learning process
- Persistence matters



Provide STEM Materials & Opportunities

- Sample materials
 - Chemistry sets, calculators, computers, LEGO robotics, and math-oriented games.
- Place these materials in a neutral location



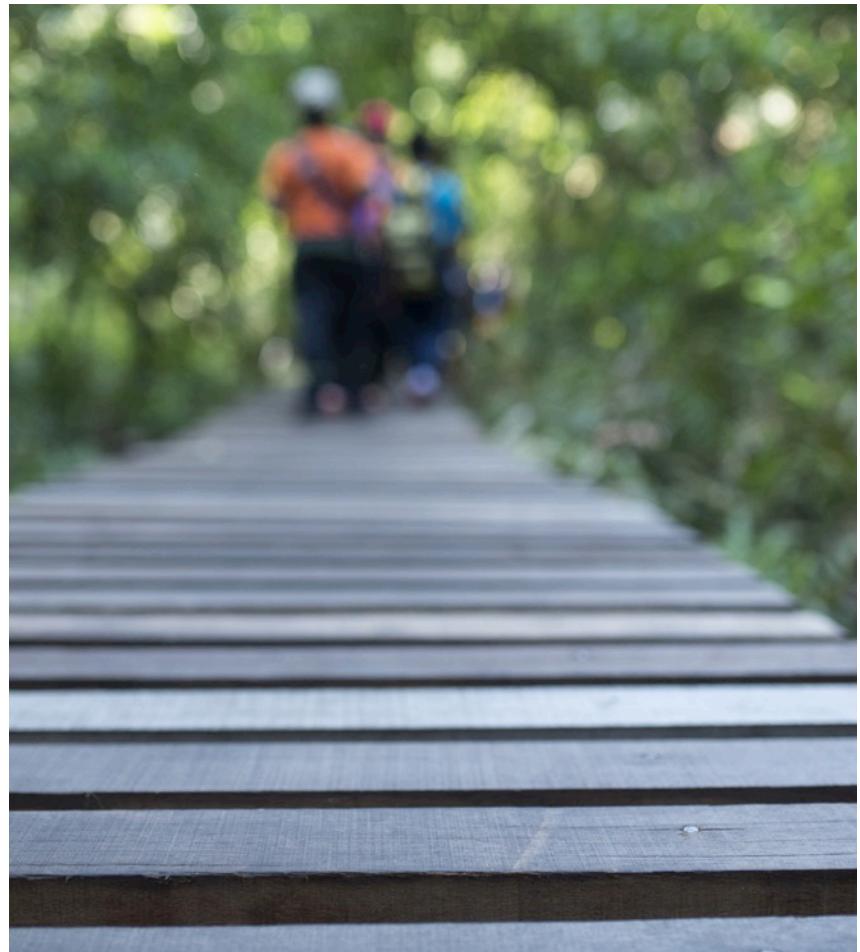
Provide STEM Materials & Opportunities

- Opportunities include
 - Robotic or computer clubs
 - Math camp
 - Smart Girls
 - Girl Scouts
- Watch STEM programs on television
- Go to planetariums and museums
- Arrange trips to various workplaces
 - Get the girls on the plant floor to take the mystery out of them



Provide STEM Materials & Opportunities

- Visit beaches, wetlands, parks and other nature area.
 - Stop and read the signs about points of interest.
- Ask questions
 - Why is it important that we take care of our parks?
 - How do bees help our environment?
 - What would happen if there were no insects?



Be Game Developer When Playing

- Play games that promote problem-solving and spatial skills
 - Jigsaw puzzles
 - Checkers and chess
 - Tangrams
 - Connect Four
 - Yahtzee
- Questions to ask
 - What was your strategy?
 - How could we change the game to make it more fun or more challenging?
 - What games would you like to invent?



Show STEM in Everyday Life

- Point out and discuss math found
 - Cooking
 - Shopping
 - Family finances
 - Building and repairs
- Examine restaurant checks
 - Make sure they are correct
 - Determine the tip



Show STEM in Everyday Life

- Kitchen science, ranging from
 - Physical and earth science
 - Engineering and math



www.sciencebuddies.org

Show STEM in Everyday Life

- While watching TV, ask:
 - What science and engineering careers do you see
 - What kinds of problems or issues do scientists and engineers address
 - Do scientists work alone or in teams
 - What hobbies or interests do you think engineers and scientists have outside their work



Be a Student Yourself

- Show how you would go about finding the answer
 - Internet
 - Email someone
 - Find as expert
 - Seek out a class
- Demonstrate first part of problem solving
 - Information gathering and asking the right questions



Be Observant and Be Involved

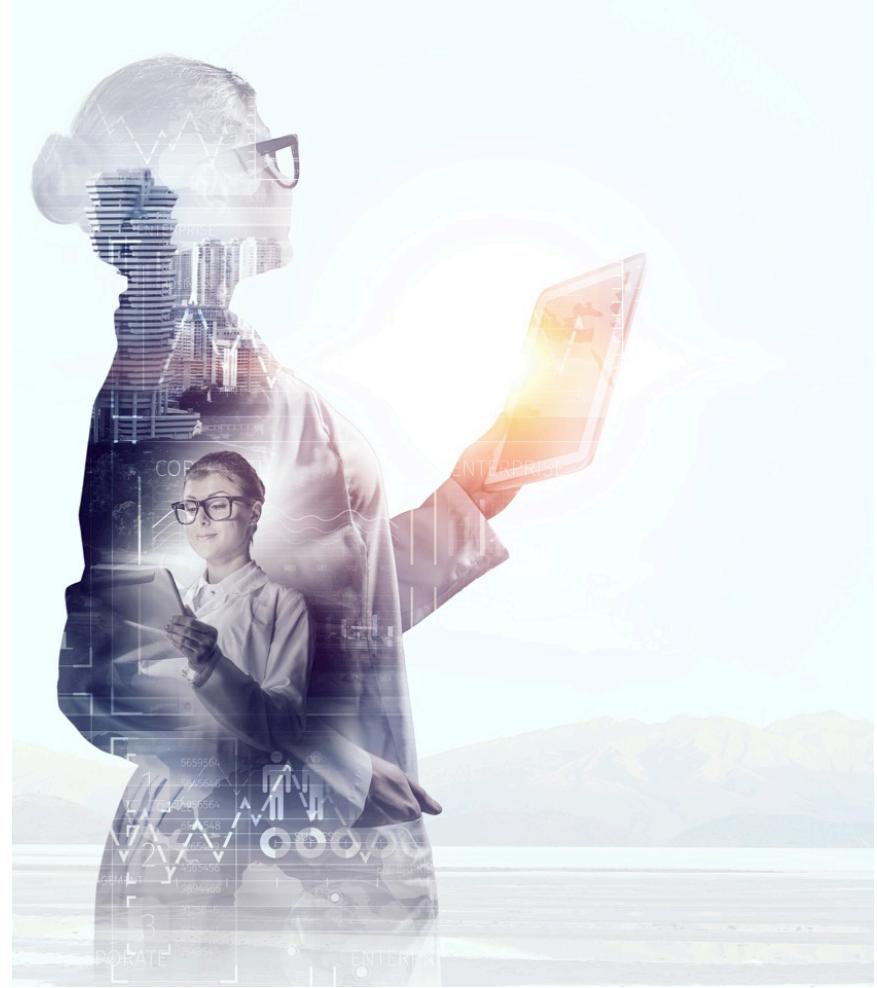
- Today's News
 - Whitson's recommendation
 - “Don’t underestimate yourself. Challenge yourself. Push yourself”
 - March for Science
 - Bill Nye the Science Guy
 - www.marchforscience.com



Source: nasa.gov

Addressing Today's Challenges

Create a gender neutral
culture at home



Women in STEM

“The participation of girls and women in STEM fields is crucial for global economic progress. Women and girls who succeed, determine whether a society is going to succeed.”

Valerie Jarrett, Senior Advisor to Obama, 2014



Source: Wikipedia

Questions or Comments



RESOURCES

- www.code.org/learn
- www.girlswhocode.com
- www.amysmartgirls.com/smart-girls-in-stem
- www.nasa.gov
- www.goldieblox.com
- www.sciencebuddies.org

RESOURCES

- Techbridge
- Iridescent
- CompuGirls
- Girls Who Code
- Black Girls Code
- Girls Inc.
- Girlstart
- Girl Scouts
- National Girls Collaborative Project
- National Council for Women and Information in Technology



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