CODE

⚥

DEBUGGING THE GENDER GAP

```
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}

function ShutMeDown ()
{
    Player.controls.stop();
}

-->
</SCRIPT>
</HEAD>
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width="0"

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</OBJECT>
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NAME="BtnPlay" VALUE="Play"
OnClick="StartMeUp()">
<INPUT TYPE="BUTTON"
NAME="BtnStop" VALUE="Stop"
OnClick="ShutMeDown()">
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<!--

function ShutMeDown ()
{
    Player.controls.stop();
}

-->
</SCRIPT>
</BODY>
</HTML>


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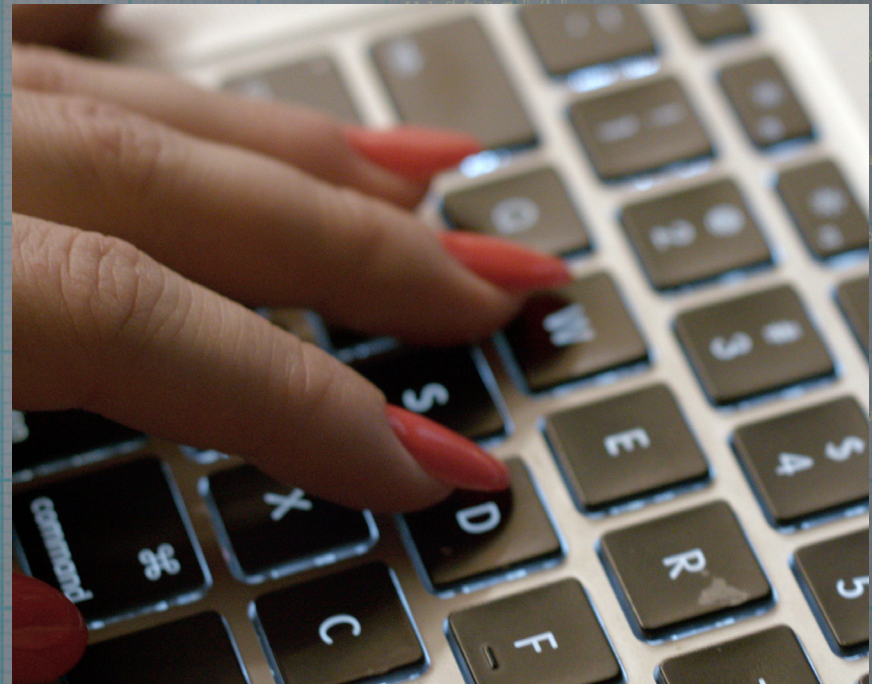
< > DISCUSSION GUIDE </>

www.CODEdocumentary.com

// TABLE OF CONTENTS

ABOUT THE FILM </>

The **technolgy industry** suffers from a persistent **gender gap...>**

The **first** computer programmer was a **woman.//**

Grace Hopper,
one of the first programmers of the Harvard Mark I computer in 1944.

In 1843, Ada Lovelace, a 19th-century mathematician, wrote the first series of instructions designed for a machine to carry out, creating what was, in essence, the first computer program. A century later, in 1944, it was another woman, United States Navy Rear Admiral and computer scientist Grace Hopper, who became one of the first programmers of the groundbreaking Harvard Mark 1 computer. Hopper coined the now-ubiquitous term "debugging" to refer to fixing a coding error.

But despite these landmark accomplishments, both Lovelace and Hopper are often overlooked in our country's popular knowledge of computer science's origins. Gloria Steinem has said that, "Women have always been an equal part of the past—just not an equal part of history." The computer science and technology industry is a powerful example of this observation.

In fact, it was not uncommon for women in the 1940s and 1950s to work in the nation's earliest computer science and coding jobs. Recruiters indeed targeted women for these positions, as they were considered clerical and administrative. It was not until the 1980s that a culture shift in computing occurred. With the advent of the personal computer, a "computer hacker" and "nerd" stereotype emerged, and this caricature was almost always a white male. At the same time, the percentage of women in computer science began to decrease dramatically.

Even now, in an age when more women attend college than men, and when gender parity has been achieved in some previously segregated fields, a gaping gender divide still characterizes computer science education and industry. The gap begins in middle school and continues through college and graduate education and into the professional sphere.

According to a 2014 report by the National Center for Women and Information Technology, less than 20% of all computer science degrees are now earned by women—down from about 36% in the mid-'80s.[1,2] Not only is the gender gap not getting better; it's getting worse.

And for African American and Hispanic women, the numbers are even lower. In 2013, only 3% of the computing workforce were African American women, and only 2% were Hispanic women.[3]

In *CODE*, we see the ways in which the gender and racial gap in computer science holds the industry back, and how a few pioneering women in coding, and some major tech companies and universities, are working to address the issue. Used as a companion to a group screening of the film, this guide can help generate and promote an open, curious and far-ranging conversation about women and other underrepresented groups in computer science—and what we can do as a society to diversify the field.

// ABOUT THE FILM

The deficit of female and minority computer science engineers in America is a mounting gender, racial and economic issue. Tech jobs are growing three times faster than our colleges are producing computer science graduates. A 2014 White House report noted that by 2020, there will be more than one million unfilled software engineering jobs requiring a bachelor's degree in the US.[4]

CODE examines why more girls and people of color are not seeking educational opportunities in computer science and explains how **cultural mindsets, stereotypes, educational hurdles, unconscious biases and sexism** play a role in this national crisis.-->

Expert voices from the worlds of tech, psychology, science, policy and education are intercut with inspiring stories of women from various backgrounds who are engaged in the fight to challenge complacency in the tech industry and have their voices heard. *CODE* aims to inspire girls, women and people of color to consider computer science as a viable career choice.

CODE filmmakers shoot an interview with Megan Smith, now Chief Technology Officer of the United States, and Beryl Nelson, a Google Software Engineering Manager, at Google headquarters.

// CHAPTER GUIDE: FEATURE VERSION

CODE: Debugging the Gender Gap comes in two versions: the feature-length cut of the film, at 78 minutes, and a shorter 51-minute cut intended for classroom use. Each version is divided into chapters: small sections of the film that focus on particular themes, interviews and stories that together make up the film's larger narrative. Educators, facilitators and moderators often enjoy referencing a chapter guide as they plan for screenings, lessons and discussions. You may even wish to play back specific chapters as you weave the film into classroom conversation or corporate talkback sessions.

To use the Chapter Guides, choose the version of the film you plan to show, and then select the corresponding guide from this document. Then, scan the chapter subtitles and descriptions below to understand the content covered in each chapter, and refer to the timecode indicated to cue your DVD or Blu-ray to the appropriate moment in the film.

CHAPTER	TITLE & TIMECODE	DESCRIPTION
0	**Introduction** 00:00:00	Are girls as good as boys on computers? Kids reflect on the gender gap in coding, and experts cite a coming boom in the demand for computer science jobs in the United States—and the current gender gap in such fields.
1	**What is Coding? / *Brave*** 00:02:30	What is coding and how does it affect us? Pixar's Danielle Feinberg describes the creative side of coding and how code is used in the Pixar film *Brave*.
2	**Origins of Coding / Ada Lovelace** 00:07:19	Ada Lovelace, a female pioneer of computing, is often regarded as the first computer programmer.
3	**Exposing the Gap / Tracy Chou** 00:10:00	Pinterest's Tracy Chou describes her work to encourage tech companies to report the number of women among their engineers, exposing a deep gender gap among tech startups.
4	**Code for Progress I** 00:12:58	Code for Progress Program Director Aliya Rahman talks about the importance of giving women and minorities a chance to become the creators—and not just the consumers—of technology.
5	**Brain Science / Is Coding an Innate Skill?** 00:14:54	Is there an "innate" difference between men and women's brains that makes men better coders? Neuroscientists explain that the brain is powerfully influenced by experience and environment.

CHAPTER	TITLE & TIMECODE	DESCRIPTION
6	**Coding in School / Kodable** 00:17:52	As the demand for coders in the workforce increases, the need to teach the basics of coding in school also increases. Kodable is an app that gives elementary school children a foundation in coding skills, paving the way for later careers in computer science. It is an example of how applications are filling the education gap.
7	**Black Girls Code** 00:21:17	Kimberly Bryant, Founder & CEO of Black Girls Code, relays how her organization creates a safe place for young girls of color to learn and practice coding without judgment, and to build confidence.
8	**The Importance of Diversity** 00:24:00	A diverse team is critically important to the innovation of products that impact and serve all people—products like airbags, voice recognition software, and even consumer software tools like Microsoft Office's on-screen "office assistant," Clippy.
9	**History / Grace Hopper** 00:27:40	Navy Rear Admiral Grace Hopper is one of the first programmers of the Harvard Mark I computer in 1944, and she coined the term "debugging" to refer to fixing a glitch in computer code.
10	**Formation of a Stereotype / Computer Girls** 00:29:40	Debbie Sterling wanted to blur the line between stereotypical "girls" and "boys" toys, so she founded GoldieBlox, an educational toy aimed at empowering girls to build, engineer and design.
11	**Stereotype Threat / Claude Steele** 00:35:22	Stanford University's Claude Steele and others introduce the concept of "stereotype threat": the phenomenon in which individuals risk confirming negative stereotypes about their social group as they grapple with that stereotype. Stereotype threat can cause women and minorities to perform poorly in areas in which they are stereotypically "bad," like math or coding.
12	**Teen Voices** 00:38:33	Eighth-grade girls talk about their experiences with coding and discuss the obstacles girls face in pursuing STEM in school.
13	**The Decline of Women in Computer Science and the Emergence of Nerd Culture** 00:44:25	The caricature of the male "computer nerd" rose in the 1980s, contributing to a popular stereotype that has positioned men as the masterminds of technology and pigeonholed women and people of color as supporting characters, not creators.

CHAPTER	TITLE & TIMECODE	DESCRIPTION
14	**Workplace Harassment** **00:52:33**	Former Business Insider CTO Pax Dickinson talks about his infamous Twitter rants about women in tech. Julie Ann Horvath tells her story about the harassment and sexism she experienced while working in the tech industry.
15	**DigiGirlz** **01:00:28**	DigiGirlz campers acknowledge that discrimination and lack of confidence discourage girls from computer science fields, but share their passion for coding and their drive to create "the next big thing."
16	**Code for Progress II** **01:02:37**	At a Code for Progress graduation event, Program Director Aliya Rahman inspires her students to go out in the world and show people what they can do with the skills they have learned.
17	**Fixing the Pipeline/** **Harvey Mudd** **College** **01:04:06**	In order to continue diversifying the tech industry, colleges need to create a welcoming and supportive environment in their classes—and specifically in introductory classes, which create the pathway for future education in computer science. Harvey Mudd College President Maria Klawe explains how her college increased its ratio of women in computer science classes from 10% to 48% in eight years.
18	**Successful Startups /** **Etsy, Strava** **01:06:02**	Strava's Evelyn Cordner recounts her journey to becoming a coder. Etsy software engineers describe their company's initiative to proactively increase the number of women in Etsy's engineering department by sponsoring and recruiting women coders from the Hacker School, an intensive computer science course.
19	**Conclusion**	Interviewees discuss the need to attract women to the tech industry, and to retain women in these jobs by giving them the opportunity to grow and hold leadership positions.

// CHAPTER GUIDE: CLASSROOM VERSION

The Chapter Guide below refers to *CODE*'s 51-minute version, a version specifically cut for classroom educators. Scan the chapter descriptions below to determine which portions of the film you might wish to integrate into classroom activities and discussion.

CHAPTER	TITLE & TIMECODE	DESCRIPTION
0	**Introduction** 00:00:00	Are girls as good as boys on computers? Kids reflect on the gender gap in coding, and experts cite a coming boom in the demand for computer science jobs in the United States - and the current gender gap in such fields.
1	**What is Coding? /** *Brave* 00:02:30	What is coding and how does it affect us? Pixar's Danielle Feinberg describes the creative side of coding and how code is used in the Pixar film *Brave*.
2	**Origins of Coding / Ada Lovelace** 00:06:00	Ada Lovelace, a female pioneer of computing, is often regarded as the first computer programmer.
3	**Exposing the Gap / Tracy Chou** 00:08:29	Pinterest's Tracy Chou describes her work to encourage tech companies to report the number of women among their engineers, exposing a deep gender gap among tech startups.
4	**Code for Progress** 00:11:16	Code for Progress Program Director Aliya Rahman talks about the importance of giving women and minorities a chance to become the creators - and not just the consumers - of technology.
5	**Coding in School** 00:12:50	As the demand for coders in the workplace increases, the need to teach the basics of coding in school also increases.

CHAPTER	TITLE & TIMECODE	DESCRIPTION
6	**Black Girls Code** 00:14:49	Kimberly Bryant, Founder & CEO of Black Girls Code, relays how her organization creates a safe place for young girls o color to learn and practice coding without judgment and to build confidence.
7	**The Importance of Diversity** 00:17:32	A diverse team is critically important to the innovation of products that impact and serve all people—products like airbags, voice recognition software, and even consumer software.
8	**History / Grace Hopper** 00:20:00	Navy Rear Admiral Grace Hopper is one of the first programmers of the Harvard Mark I computer in 1944, and she coined the term "debugging" to refer to fixing a glitch in computer code.
9	**Formation of a Stereotype / Computer Girls** 00:21:59	Programming used to be a popular career for females in the 1950s and 60s, but ads and marketing for the industry later began targeting only men, contributing to a rise in the gender gap in tech fields. Debbie Sterling wanted to blur the line between stereotypical "girls" and "boys" toys, so she founded GoldieBlox, an educational toy aimed at empowering girls to build, engineer and design.
10	**Stereotype Threat / Claude Steele** 00:27:43	Stanford University's Claude Steele and others introduce the concept of "stereotype threat": the phenomenon in which individuals risk confirming negative stereotypes about their social group as they grapple with that stereotype. Stereotype threat can cause women and minorities to perform poorly in areas in which they are stereotypically "bad", like math or coding.
11	**Teen Voices** 00:30:16	Eighth-grade girls talk about their experiences with coding and discuss the obstacles girls face in pursuing STEM in school Female coders explain the discrimination they had to overcome when they were entering the tech world as young women.
12	**The Decline of Women in Computer Science and the Emergence of Nerd Culture** 00:35:19	The caricature of the male "computer nerd" rose in the 1980s, contributing to a popular stereotype that has positioned men as leaders in tech fields and pigeonholed women and people of color as supporting characters, not creators. As this stereotype emerged, the industry's gender gap grew.

CHAPTER	TITLE & TIMECODE	DESCRIPTION
13	**Introducing Coding to Broader Communities** 00:39:53	Teen girls acknowledge that discrimination and lack of confidence discourage girls from computer science fields, but they share their passion for coding and their drive to create "the next big thing." At a Code for Progress event, Program Director Aliya Rahman inspires her students to show people what they can do with the skills they have learned.
14	**Successful Startups / Strava** 00:42:26	Strava's Evelyn Cordner recounts her journey to becoming a coder.
15	**Conclusion** 00:44:19	Interviewees discuss the need to attract women to the tech industry, and to retain women in these jobs by giving them the opportunity to grow and hold leadership positions.

// THE FILMMAKERS

Robin Hauser Reynolds **Director/Producer**

Robin is the director and producer of cause-based documentary films at Finish Line Features, LLC. As both a business woman and a longtime professional photographer, Robin brings both her creative eye and leadership skills to her documentary film projects. Her years in fine art photography give her a keen vision for the artistic design of her films; her experience in the business world affords her a unique perspective on what it takes to motivate an audience. Robin's most recent film, *CODE: Debugging the Gender Gap*, premiered at Tribeca Film Festival 2015, and has caught the attention of the international tech industry and of policy makers in Washington, DC and abroad. Previously, Robin co-directed and produced the documentary feature *Running for Jim*, which won 14 awards at 20 film festivals. Robin received her BA from the University of California, Berkeley and her MBA from Thunderbird School of Global Management. She has spoken about the importance of increased diversity in computer programming and on behalf of women's rights at the Mobile World Congress, SXSW Interactive Conference, InspireFest, AT&T Foundry FutureCast, and Dell Women Entrepreneur Network. As director of *CODE*, Robin has been featured in national publications including *USA Today*, *Wired*, *Forbes*, *Fortune*, *The New Yorker*, *The Atlantic*, *Fast Company*, *Cosmopolitan*, *Glamour*, *Marie Claire* and *San Francisco Business Times*.

Staci Hartman **Producer**

Tapping into a rich background of more than 15 years in various marketing roles for high-technology companies, including Apple, Xerox and HP, Staci brings a wealth of innovative thinking and resourcefulness to the development, production and outreach of *CODE*. In keeping with her interest in social entrepreneurship, Staci continues to focus on building partnerships to serve the greater good. A graduate of UC Berkeley, Staci was Producer and Outreach Coordinator on the documentary *Running for Jim*.

Jon Blomgren **Director of Photography**

Jon Blomgren's cinematography turns ordinary scenes into visual artistry. His footage has appeared on ESPN E:60, Sports Center, network television and in the documentary film *Running for Jim*. Jon's corporate clients include United Nations Foundation, Draft FCB, BSSP, Voxer and Applied Fusion.

Christie Herring **Editor/Producer**

Christie Herring is an award-winning editor, producer and director. Her films have screened at festivals around the world, and her ITVS-funded documentary, *The Campaign*, aired on public television in 2014. Christie's credits include work with PBS, National Geographic, A&E and many nonprofit and corporate clients. She received her MA in Documentary Filmmaking from Stanford University.

Jack Youngelson **Story Consultant**

Jack Youngelson is an Emmy-winning writer, producer and director. His credits include *Ghosts of Abu Ghraib* (which premiered at Sundance 2007), *Tierney Gearon: The Mother Project*, *McConkey* and *Mission Blue*. His projects have appeared on HBO, PBS, A&E, Bravo, BBC and Channel Four.

// KEY SUBJECTS

Kiara Boboff is a high school freshman who has taught herself the programming language Ruby. She is thus far undaunted by the male-dominated landscape and is determined to pursue her interest in coding despite limited access to computer programming courses in school. We meet Boboff in an intimate setting with her friends while she shares the website she designed. The four teenagers candidly discuss their interest in learning to code.

Tracy Chou, a software engineer at Pinterest, led the effort to encourage tech companies to divulge their diversity numbers. Chou paints a realistic view of the challenges women face in the tech environment. She was recently profiled in *Forbes'* 30 Under 30.

Evelyn Cordner, the 23-year-old sole female programmer at Strava, is an example of a young woman who appears unfazed by being the only female coder at her startup tech company. Cordner was a mathematics student and varsity lacrosse player at MIT. She now works in Strava's programming department with 25 men. An avid runner, her sense of belonging is secure because all employees at Strava are bonded through athletics.

Danielle Feinberg is the Director of Lighting for Photography at Pixar. She uses coding to create light and movement in animated films. Danielle's list of credits includes *Wall•E*, *Brave*, *Finding Nemo*, *A Bug's Life*, *Toy Story 2*, *Monsters, Inc.* and *The Incredibles*. We follow Feinberg to Camp Reel Stories where she helps budding filmmakers edit their first films. She has a computer science degree from Harvard and is an example of a woman who uses her coding skills to enhance her artistic and creative talents.

Julie Ann Horvath is the energetic founder of Passion Projects. Horvath divulges her now-public sexism scandal with her former boss at GitHub and affirms the importance of being a role model by exposing gender discrimination in the workplace. She isn't afraid to be "that woman" and speaks openly about the misogynistic startup culture she has experienced. She aspires to help women navigate the male-dominated tech industry and to bring change to the tech workplace.

Walter Isaacson is the author of *The Innovators* and *Steve Jobs*. He is also the CEO of The Aspen Institute, and was chairman of CNN and the managing editor of *Time Magazine*. In *CODE*, Walter discusses the historical contributions of women in computing.

Colleen Lewis teaches computer science at Harvey Mudd College in California. In 8 years, Harvey Mudd has increased its ratio of women in computer science classes from 10% to 48%.

Courtney Nash is an African American Mills College graduate student who is learning computer science in hopes of becoming an educator who will teach coding to low-income people of color. She aims to "move around some social capital." Nash was a foster child who spent her childhood "in the system" in Compton, CA. She had lived in 12 homes by the age of 18. She shares her views of what it is like to be a minority within a minority in computer science.

Aliya Rahman is the Program Director at Code for Progress, a progressive coding community that brings reemerging citizens into the programming field through classroom training and business mentoring. Rahman studied rocket propulsion, is a pilot, a social activist, a DJ and a skilled coder. Her Code for Progress students are creating apps that serve the underserved. These include important and altruistic apps such as Buscando, which helps immigrant children find their families. Rahman believes in the importance of empowering minorities and providing them with the tools they need to dissolve the digital divide.

Megan Smith worked at Google[x] for nine years and is now Chief Technology Officer of the United States of America. In *CODE*, she speaks passionately about cultural issues that have lead to the gender gap and digital divide in tech.

ALSO APPEARING

Sarah Allen, Founder, RailsBridge
Nate Blecharczyk, CTO, AirBnB
Helen Bradley, Former SVP NetApp and Sun Microsystems
Cedric Brown, Managing Partner, Kapor Center for Social Impact
Kimberly Bryant, Founder & CEO, Black Girls Code
Ruthie Byers, Software Engineer, Pivotal
Alysia Christakos, Student, DigiGirlz
Cornelia Davis, Director, Platform Engineering, Pivotal
Pax Dickinson, Co-Founder, Glimpse
Carol Dweck, Psychologist, Stanford University
Nathan Ensmenger, Historian, Indiana University
Jocelyn Goldfein, Former Director of Engineering, Facebook
Surabhi Gupta, Engineering Manager, AirBnB
Marc Hedlund, VP Engineering, Stripe
Roz Ho, SVP, Ericsson
Lara Hogan, Senior Engineering Manager, Etsy
Grechen Huebner, Co-Founder, Kodable
Bekki Jam, Software Engineer, AirBnB

Maria Klawe, President, Harvey Mudd College
Bethany Macri, Software Engineer, Etsy
Jane Margolis, Senior Researcher, University of California, Los Angeles
Krista Marks, Board Member, NCWIT
Adam Messinger, CTO, Twitter
Jennifer Raymond, Neurobiologist, Stanford University
Avis Yates Rivers, Board Member, NCWIT
Ashley Sanchez, Student, DigiGirlz
Reshma Saujani, Founder & CEO, Girls Who Code
Ari Schlesinger, Student, Pitzer College
Xanda Schofield, Software Engineer, Yelp
Elissa Shevinsky, Co-Founder and CTO, Glimpse
Claude Steele, Dean of the Graduate School of Education, Stanford University
Debbie Sterling, Founder & CEO, GoldieBlox
Jen Wang, Software Engineer, Yelp
Allen Wyler, Neuroscientist

// WOMEN IN CODING: BY THE NUMBERS

The infographics below illustrate the declining percentage of women represented among those who earn computer science degrees, as the demand for technical workers in the United States rises. We see, too, the percentage of women currently employed in technical fields nationally, and at specific tech companies. Note that while the Bureau of Labor Statistics indicates that 24.9% of all programming or software jobs in the tech industry are filled by women, this number drops to 23.3% when the data includes hardware-related jobs like electrical engineers.

It's notable, too, that while many Silicon Valley startup tech companies tend to have lower proportions of women among their technical employees, many companies across sectors and industries— including companies that are not specifically in the technology sector—have large technical workforces. Many of these other firms, as well as more established tech firms such as IBM, have close to 30% women in their technical workforces. These higher numbers are important to recognize and celebrate, as they are an indicator that gender equity in technical fields is possible.

Women in Technical Jobs

10% Twitter

15% Facebook

17% Google

20% Apple

21% Pinterest

23% National Representation
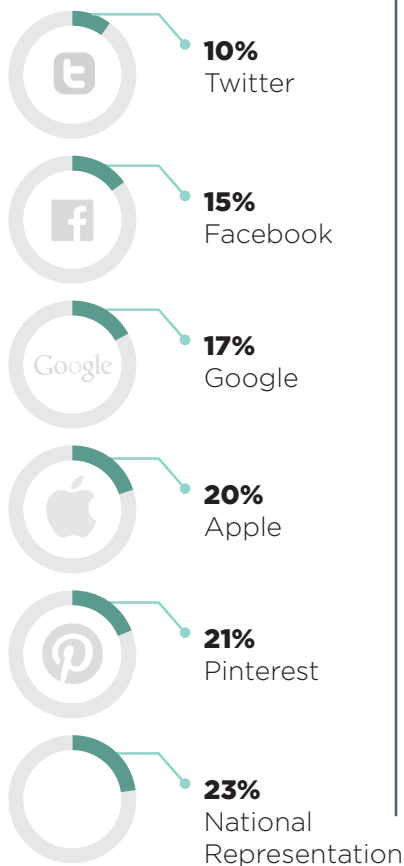
Women in Computing Occupations by Percentage

24.9% Comput-

8.5% Engineer-

Demand for Technical Workers

1.4 Million Computer Jobs
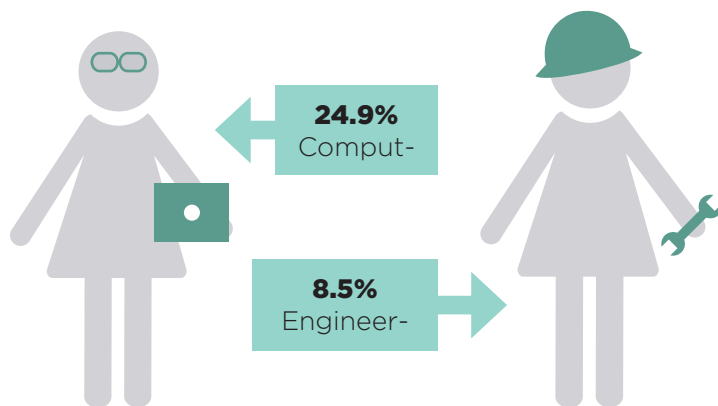
400K Computer Science Students

Women Earning BA in Computer Science

30%

15%

0%

2001   2012

10% drop
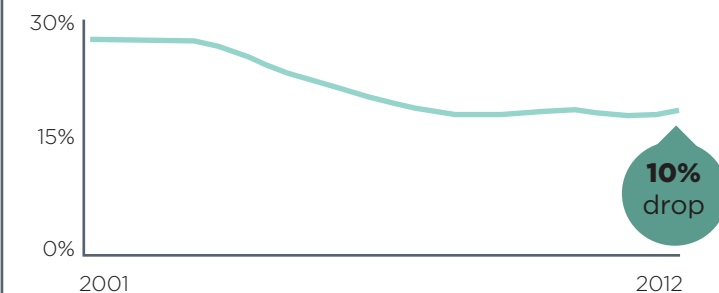
Women's Representation in Computer Science Degrees Awarded in the US

27.6% 2001

18.2% 2012
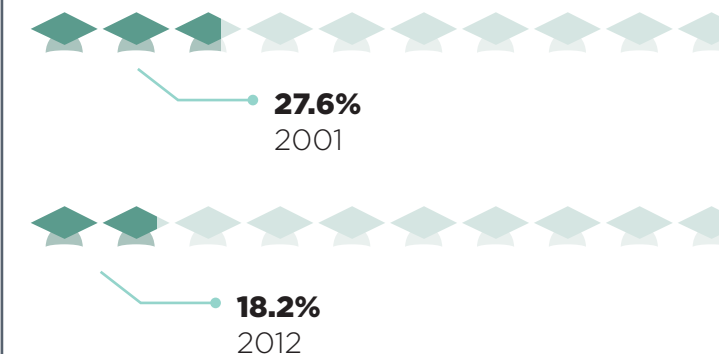
// A HISTORY OF WOMEN IN CODE

1843 **1946** **1952** **1972** **1973** **1978** **1983** **1984** **1989** **1990** **1998** **2012** **2014**

Ada Lovelace develops what is now considered to be the first computer program.

The ENIAC Programmers, a group of six women, became the first people to program a modern computer—the first general purpose computer, the ENIAC, for which they programmed ballistic trajectories for the military.

Sandra Kurtzig founded the technology company ASK Group with $2,000 in savings, growing it to become a dominant leader in business and manufacturing software. In 1981, ASK Group had its IPO (initial public offering), and Kurtzig became the first woman to take a Silicon Valley technology company public.

Karen Spark Jones introduced the concept of inverse document frequency (IDF) weighting in information retrieval. IDF is used in most search engines today.

Carole Shaw became the first female video game designer with the creation of her 3D Tic-Tac-Toe for Atari.

Dawn Lepore was hired as manager of the Charles Schwab's information center. Despite lacking a master's degree in business or computer science, she was promoted in 1993 to become Schwab's chief information officer. In 1995, she helped pioneer the firm's web-based stock trading. Under her leadership, Schwab became number one in online trading.

Fran Allen became the first female IBM Fellow. At IBM, she has been a pioneer in the field of compiler optimization and parallelization. In 2006 she became the first woman to win the Turing Award.

Ginni Rometty became Chairperson, CEO and President of IBM, a *Fortune* 50 company. She has been a *Fortune* magazine "50 Most Powerful Women in Business" for ten consecutive years.

Diane Greene co-founded VMware, the leading provider of enterprise cloud and virtualization software. She now serves on the boards of Google and Intuit.

Sandy Lerner co-founded Cisco Systems, which became a *Fortune* 100 company that has enabled the extensive buildout of the Internet.

Grace Hopper invented the first compiler for a high-level programming language and popularized the idea of machine-independent languages. Her work led to the development of the COBOL programming language, which enabled the use of computers for business applications.

Adele Goldberg did pioneering work in languages and personal computing as part of the Dynabook team and later, as manager at Xerox Parc. Her work with the Smalltalk language has influenced all modern object-oriented languages. Her work was also influential in the history of graphical user interfaces, what-you-see-is-what-you-get interfaces and user interface design.

Helen Greiner co-founded iRobot, where she has been a pioneer in the area of robotics, launching products ranging from Roomba for consumers to PackBots for the US Armed Forces. She took iRobot public in 2005. In 2014, she was appointed Presidential Ambassador for Global Leadership by President Barack Obama.

Megan Smith became the first female Chief Technology Officer of the United States, appointed by President Barack Obama.
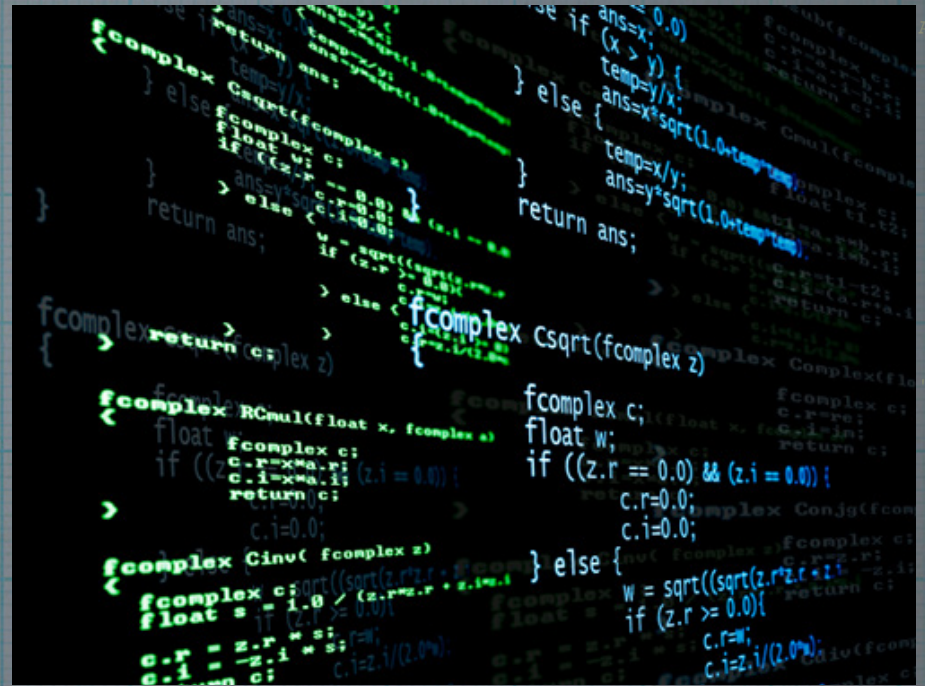
HOST A SCREENING </>

Your **screening will facilitate important discussion** in your classroom or at your company**...>**

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// SCREENING & DISCUSSION

UC Berkeley Executive Vice Chancellor and Provost Claude Steele, featured in *CODE: Debugging the Gender Gap*, says that it takes about a generation to change a stereotype.

Your screening is one first step in the right direction. The film exposes the dearth of American female and minority software engineers, coders and computer scientists. It invites an investigation into the reasons for this persistent gender gap. And it asks the question:

What would society gain from having more women and minorities code?

By bringing *CODE* to corporations, to classrooms and into communities, we can together jump-start a thoughtful and nuanced national conversation about the gender gap in computing—and what we can do to close it. In so doing, we can invite broader participation in the search for educational practices, policy changes and industry reforms that will encourage the greater participation of women in tech fields.

Corporate facilitators, middle and high school teachers and university professors all have opportunities to integrate a discussion about the gender gap in computer science education and careers. See the sidebars on pages 19, 21, 23 and 25 for specific ideas on using *CODE* in your classroom or corporation.

CODE filmmakers shoot a scene with Aliya Rahman, former Program Director of Code for Progress.

// CHECKLIST FOR SCREENING ORGANIZERS

Three Weeks Prior to Your Screening

☐ Seek all necessary approvals for a screening event. At a corporation, this might mean seeking permission from your company leadership; in a school, this might mean receiving the green light from a department head. In either case, you may wish or need to complete an internal, small-group screening of the film before planning a screening for students or organizing a formal corporate event.

☐ If you're a classroom teacher or university professor, ensure that your library has purchased and secured the license—otherwise known as "public performance rights"—to the film by visiting www.CODEdocumentary.com and following the links for an educational or institutional purchase. If you're a corporate facilitator, visit www.CODEdocumentary.com and secure your corporate license.

☐ Choose a location, date and time for your screening. Be sure to reserve or procure the appropriate audio-visual equipment (including a projector, a DVD or Blu-ray player, a big white screen or blank wall and speakers).

☐ In anticipation of showing *CODE* in a corporate setting, consider preparing a moderator, trainer or facilitator to lead discussion sessions or talk-backs after your screening. Provide the DVD and this screening guide in advance of your event. If you're an educator, use this guide and the resources compiled in the Learn More section on page 28 to prepare for classroom activities and discussion to precede and follow your screening.

Two Weeks Prior to Your Screening

☐ If you'll show *CODE* as a part of a corporate conference, an all-school screening or a public community event, promote your screening on social media platforms by using photo stills from the film (all downloadable from the film's digital press kit) or link to the film's trailer. You can get even more creative by Tweeting quotes from the film in the lead-up to your event, or reposting the sharing-ready graphics from Code.org.

☐ Prepare your students or employees for your screening by distributing or assigning background reading or listening on the issue. For educators, consider listening as a class to the Planet Money podcast referenced on page 28. If preparing for a corporate screening, consider playing Reshma Saujani's "Girls Who Code" TEDx talk, also referenced on page 28, on a loop in your cafeteria or break rooms in the weeks before your screening.

The Week of Your Screening

☐ Do a technical test of your DVD or Blu-ray and equipment.

☐ Make sure the DVD plays all the way through.

☐ Make sure your projector, audio and DVD player cables fit.

☐ Make sure your sound is audible.

☐ Make sure the picture projected on your screen or wall is the right shape and size. If not, adjust your player's and/or projector's aspect ratio settings until the picture looks right. Selecting "widescreen" or "16:9" is usually best.

LEADING THE CONVERSATION </>

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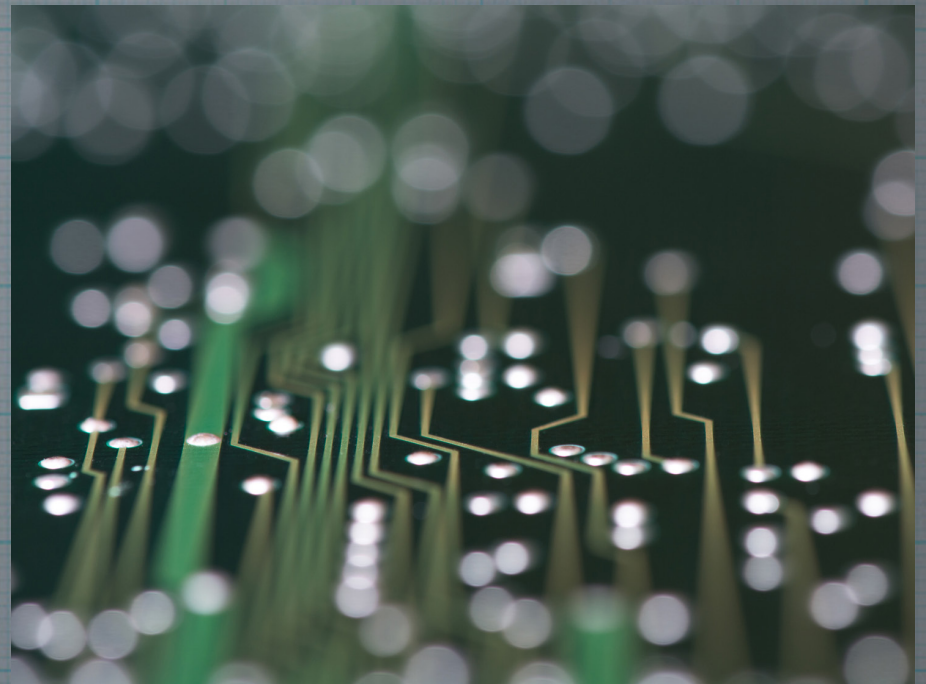
// GETTING STARTED

Below, find conversation prompts aimed at providing you with ideas for leading a productive dialogue after your screening of *CODE: Debugging the Gender Gap*.

We've grouped questions by intended audience, but note that you might want to select prompts from among the diverse sections to create a conversation customized to the particulars of your gathering, training or classroom.

For context, additional data and a trove of multimedia resources, peruse the Learn More section on page 28. Throughout the guide, you'll also find sidebar content, an infographic timeline and live links to sources. Note that sidebars, like discussion questions, are geared toward specific audiences, but that they offer suggestions for pre- and post-film activities that might work with any group.

Sidebars and discussion questions, while written with specific audiences in mind, offer suggestions for **pre- and post-film activities** that might work with any group**...>**

// FOR CORPORATIONS

1 How do you feel after watching *CODE*? What was the first, gut reaction you had? What surprised you the most?

2 Think about your corporate culture. Do you think there are different expectations for men and women at your company? Do you see more men in technical jobs or in jobs requiring regular use of quantitative or scientific training? Do you think the women in your corporation are offered equitable opportunities for advancement or leadership in technical positions?

3 Several women in the film describe experiences where they have been treated differently because of their gender (lowered expectations, having to repeat themselves, being excluded, being harassed, etc.). Have you observed this at your workplace? Have you experienced it?

4 *CODE* reveals that there are relatively few qualified programmers, and few computer science graduates, in the current US job market. Do you see evidence of this trend in your company's hiring patterns? How does your company recruit for coding or technical positions?

5 Does your company have women coders? Whatever your answer, how do you think the presence or dearth of female coders affects your company's efficiency and culture? Why do you think your company has the gender breakdown it does?

6 Do you feel corporations should assume an active role in encouraging women to join the computer science field? How can corporations do so? What partnerships or collaborations with universities, high schools or nonprofit organizations might increase the visibility of computer science jobs available to young girls and women?

7 In *CODE*, Tracy Chou of Pinterest says, "I don't think software engineering is a meritocracy." Has your viewpoint on meritocracy in the tech industry changed over time? If so, why?

8 In 25 states, high school computer science classes do not count toward graduation credits. Would you support a mandatory, for-credit computer science class in public schools? Starting at what grade level?

Using *CODE* in the Corporate Setting

Fitting a film and a discussion into the pace of corporate life can be difficult. Consider setting aside time for the conversation in creative ways:

- Give *CODE* to new hires as part of their onboarding process, and set aside 15 minutes to discuss the film at their first performance review.

- Use *CODE* as part of professional development or diversity training.

- Program *CODE* in the entertainment portion of your next industry conference and curate a panel or plenary session the next day to address gender equity in tech.

- Use *CODE* to ignite conversation at your next corporate retreat.

- Play clips from *CODE* in your office's public areas, like break rooms, conference rooms and the cafeteria. License the film for your corporate library, for circulation among working groups or individual employees.

- Post-viewing, convene a task force on diversity in tech at your corporation. Meet weekly to set an agenda for how your company can improve the ranks of women and minorities in your firm's coding jobs.

9   Cedric Brown of the Kapor Center for Social Impact notes in the film, "We have got to figure out a way to make the pipeline of tech talent more robust… to look at communities that have been overlooked and underutilized." In your corporation, are there communities that are under-utilized? How could your corporation change its recruiting, hiring, or retention practices so as to attract women and minority candidates, even though these groups are underrepresented in the current "pipeline"?

10   The film describes how programmers have been encouraged to think of themselves as a "special breed" with "a certain kind of mind." Do you think this is true? Does this categorization exist at your company? To what type of person might this rhetoric appeal? Who might find it off-putting?

11   CODE introduces the history of women in computing. Why do you think the proportion of women working in computer science decreased so significantly in the recent decades, despite their proven proficiency in the field in the '50s, '60s and beyond?

12   According to the National Center for Women in Information Technology, 56% of women in technology leave their employers mid-career.[5] Do you see this trend at your own company? What are women employees' reasons for leaving? What shifts in company policy or culture might make them stay?

13   The Bureau of Labor Statistics reported in January 2015 that women held just over 30% of jobs in "computer systems design and related services."[6] But as former software engineer Ellen Ullman wrote in a 2013 New York Times Op-Ed piece, this job designation is vague and broad, and doesn't necessarily signify a technical or coding role. "We get stalled at marketing and customer support, writing scripts for Web pages," she writes. Within your tech department, how many women are actually coding? How many are, as Ullman puts it, "looking into the algorithmic depths, getting close to the machine?"

14   Elissa Shevinsky, CTO and Co-Founder of Glimpse, explains that, "The tech world and the tech culture [will] be so much better for everyone when there are more women in the room. The problem is it's hard with a good conscience to encourage more women to come into an environment that will sexually harass them and not fund them." Do you agree with her? Given the current male-dominated culture in the tech industry, do you encourage women to pursue STEM careers? Why or why not?

15   The organization Tools for Change, which advocates for gender equity in science fields, notes that, "There are four ways office politics are trickier for women than men—and even trickier for women of color. Women have to prove themselves over and over; they have to navigate a tightrope between being too masculine and too feminine; having children just compounds both those problems; and gender bias often ends up creating highly freighted relationships among women themselves." Which of the four patterns, if any, have you experienced or observed in your workplace? Listen to both men and women in your group. Do you answer this question differently from one another?

Notes:

// FOR COLLEGE CLASSROOMS

1. How do you feel after watching *CODE*? What was the first, gut reaction you had? What surprised you the most?

2. Think about your university or college. Do you think there are different expectations for men and women at your school? Do you see gender imbalances in your courses? What about science and math courses, specifically? Are these expectations different from what you experienced in high school? Think of one specific example of a gender imbalance you've experienced. Why do you think it occurred?

3. Jocelyn Goldfein, formerly of Facebook, says in the film, "This industry will run out of gas if we are not producing enough computer science talent." Do you feel this sense of urgency in your computer science courses? Is this an issue your professor(s) or administration addresses? When you look around your college classrooms, do you see peers who could be successful in computer science but are choosing to take a different path?

4. *CODE* reveals that only a small and homogenous percent of the population currently does most of the nation's work in computer science and coding. Do you think colleges can help correct this? What would that look like? Make a list of five specific policies or cultural factors that would broaden the participation of women and people of color in the STEM fields at your college.

5. Before you saw the film, were you thinking about a career in tech? Now that you've seen it, would you consider a career in coding? Did the film change your mind about what a career in computer science might look like?

6. One way to attract more women to computer science is to ensure that there is already a significant population of women working in the field. This is often called the "critical mass" dilemma. How can we encourage more women to pursue careers in coding when there are not yet many female coders? Can you think of historical precedents for overcoming this dilemma in other fields?

7. There's a gap in how products are marketed (universally) and how they are developed (by a small cohort of mostly white, and mostly male, coders.) What's one product you wish had been developed by a diverse group of coders, with participation from women, people of color, and people from a range of economic backgrounds?

For College Educators: Number-Crunching the Gender Gap

Research indicates that universities that offer family-friendly policies are better at attracting and retaining female employees. Challenge your students to assess the gender gap on your own campus.

- Screen *CODE* in your classroom or assign it for homework.

- Working in pairs or as a class, your students can use the Tools for Change Cost Simulator to assess the economic impact of family-friendly policies on university departments.

Note: to generate real numbers, you'll need to prepare your department's budget, hiring and tenure data for your students— or show them where to find it. Alternately, students can create hypothetical models to simulate different outcomes. Be sure to build out time for presentation and discussion.

8 A 2014 White House report has estimated that more than one million jobs will be available by 2020 in a computing-related field.[7] How do you think your college is preparing students for these jobs? Do you see efforts on campus to recruit students to computer science and computer engineering?

9 Gloria Steinem said, "Women have always been an equal part of the past, just not an equal part of history." This is clearly the case in computer science and technology. Had you heard of Grace Hopper or Ada Lovelace prior to watching the film? Were you aware of the history of women in coding?

10 A student's first opportunity to take a computer science class in school is often not until college. What can high school or middle school educators do to change this? How can secondary schools specifically encourage girls to pursue coursework in coding, before they get to college?

11 Julie Ann Horvath, formerly of GitHub, says, "Males tend to project their nerd-girl fantasies onto any woman that they can in this industry and it makes it really hard for women to be seen as professionals." Have you seen this in the college setting? Do you think this is true? Describe your experiences.

12 Do you think women are sexualized in all professions? Do you think circumstances are different for women in the tech industry? If so, how?

13 Danielle Feinberg of Pixar Animation Studios notes that, "Coders should be everybody at this point." *CODE* focuses on the gender gap in computer science, but who else might be included as "everybody"? Aside from gender, which demographics are underrepresented in STEM courses at your school? Think about race, ethnicity, country of origin, faith, sexual orientation and age, in addition to gender.

14 The organization Tools for Change, which advocates for gender equity in science fields, believes that "Two factors have stalled women's advancement in science: implicit bias and lack of family-friendly policies." Could shifts in the culture of higher education or the specific policies at universities reshape this implicit bias against women? Could training at the college level pave the way for corporations to change their policies?

15 Imagine yourself in 15 years, at a job in a tech field. What do you think will have been accomplished? Will the gender gap be closed?

Notes:

// FOR HIGH SCHOOL CLASSROOMS

1 How do you feel after watching *CODE*? What was the first, gut reaction you had? What surprised you the most?

2 Think about your high school. Do you think there are different expectations for males and females? Do you see gender imbalances in your classes? Think about your required English class. Now your required math class. Now think about your elective courses, specifically science and math electives. How does gender play out in each?

3 Do you think the American education system is not sufficiently preparing students for the workforce by allowing them to graduate high school without basic computer science education? Is this the case at your school? If so, how could this change?

4 Danielle Feinberg of Pixar Animation Studios says in the film that, "Coding is magic." Did that surprise you? Had you heard that before?

5 Do you think there is a female version of the so-called "computer geek" stereotype? If so, what does that caricature look like? If not, why not?

6 Author Walter Isaacson says that, "For the digital revolution to truly be great and to transform this world, it's got to be inclusive." Think about your high school. What elements are inclusive? What elements are exclusive? (Hint: Think about sports programs, extracurricular activities and specific courses.) Whether exclusive or inclusive, do you think they were always this way? Do you think they always will be?

7 Can you think of any possible benefits to being a woman in a male-dominated field like computer science? What about the benefits of being male in a male-dominated field?

For High School Teachers: Reimagining the "Nerd"

Note: Not just for high school educators! If you teach elementary, middle school or college, your students can engage with this activity. Simply adjust the take-home assignment or classroom conversation to your students.

By the time they reach high school, students are likely to have already experienced the gender gap in STEM fields.

Before coordinating an in-class screening of *CODE*, set aside a class period for a pre-screening activity. Working in pairs, your students should collectively identify 5 to 10 examples of characters in popular media (television, movies, books, comic books, games, etc.) that are depicted as "nerds." What are the qualities of these characters? Are they male or female? Heroes or victims? Are they portrayed as intelligent, unintelligent, outgoing, introverted, attractive or unattractive? What are their relationships to computers? Technology? Math? Science?

After your class discussion, assign *CODE* as homework. In either a take-home writing exercise or an in-class dialogue, ask your students to reflect again on the stereotype of "computer nerd." How have their attitudes and assumptions shifted? How do they see the film as re-framing their ideas about tech?

To take the conversation even further, assign students a follow-up activity that puts dialogue into action. Ask them to explore coding opportunities at your own school. What's offered? What's not? How could your school create space for additional coursework or extracurricular activities in computer science? Encourage students to interview school leaders, peers and educators about what's being offered and where there are gaps. Encourage your students to use what they learned in *CODE* to push back against parents, peers or school administrators whose views reflect popular stereotypes about who's interested in computer science.

8   Julie Ann Horvath says in the film, "Being excellent or being good at your job isn't enough if you're a woman in tech." What does she mean by this? Have you seen this in your own school? If so, how do you know this is true?

9   Before you saw the film, were you thinking about a career in tech? Now that you've seen it, would you consider a career in coding? Did the film change your mind about what a career in computer science might look like?

10   What do you think tech companies do to connect with high school students who are interested in coding? What can they do specifically to encourage girls?

11   The organization Black Girls Code conducts all-girl "hack-a-thons." Girls Who Code convenes a Summer Immersion Program for girls who want to learn to code. Geek Girl hosts all-girl coding summer camps. Are you aware of these programs? Would you participate? Do you think more all-female environments would be helpful to encourage girls to pursue math and science? Is it strange to think of all-girl experiences as promoting gender equity? Why or why not?

12   Prior to watching this film, did you believe that a person needed special skills, a particular temperament, or a specific personality type to be successful in computer science? Do you still think this? Why or why not?

13   Do you think you might feel differently about computer science if you had been exposed to a program like Kodable in elementary school? In middle school? Do you think it's ever too late to be exposed to coding?

14   Several women in the film describe experiences in which they have been treated differently because of their gender (lowered expectations, having to repeat themselves, being excluded, being harassed, etc.). Have you observed this in the classroom? Have you experienced it?

15   Helen Bradley tells a story in the film about being singled out in a math class at MIT for having done her homework. She's told women are held back because they "always do what they're told." Do you think this attitude has changed in the past 30 years?

Notes:

// FOR MIDDLE SCHOOL CLASSROOMS

1. How do you feel after watching *CODE*? What was the first, gut reaction you had? What surprised you the most?

2. What's the most important reason you can identify for increasing the number of female coders?

3. Think about your math class. Are their different attitudes about girls and boys? Are there different expectations for success? Explain.

4. Do you have role models in the technology field? Are they male or female? Listen to the answers of both your female and male peers. Are the answers different?

5. What do you think of the film's story about the Barbie who says, "Math is tough" and asks for help from a boy? Did this surprise you? How did it make you feel?

6. At which academic areas do you think you're best? How do you know? Does your confidence about your ability come from your parents? Your peers? Your teachers? Popular culture? Do you think your gender plays a role in your confidence?

7. How does your own experience with school compare with what is presented in *CODE*? Have you taken a computer science class so far?

8. Before you saw the film, were you thinking about a career in tech? Now that you've seen it, would you consider a career in coding? Did the film change your mind about what a career in computer science might look like?

For Middle School Teachers: An Hour (or Three) of CODE

Note: Not just for middle school educators! If you teach elementary, high school or college, your students can participate in an Hour of Code, too!

The Hour of Code is a one-hour introduction to computer science, designed to demystify code and show that anybody can learn the basics. To date, 103,494,126 students have participated…and counting!

Visit www.hourofcode.com/us to learn how to bring an Hour of Code to your classroom. Then schedule a screening and discussion of *CODE* for the class periods before your Hour of Code event. After the 90-minute film, set aside 30 minutes to ask students to reflect on the film. Then revisit the questions in this guide again after they've tried coding themselves. What are your students' experiences? How have they changed?

Notes:

9 Were you exposed to a program like Kodable in elementary school? If so, how do you think that has influenced you now that you're in middle school? If not, do you think it would change the student you are now? The courses you're best at? The courses you like the most?

10 It has been reported that girls' confidence in math and science decreases during the middle school years. Do you see evidence of this in your own classroom?

11 The organization Black Girls Code conducts all-girl "hack-a-thons." Girls Who Code convenes a Summer Immersion Program for girls who want to learn to code. Geek Girl hosts all-girl coding summer camps. Are you aware of these programs? Would you participate? Do you think more all-female environments would be helpful to encourage girls to pursue math and science? Is it strange to think of all-girl experiences as promoting gender equity? Why or why not?

12 Do you know any women with professional careers in STEM fields? Any female coders? Who?

13 Danielle Feinberg of Pixar Animation Studios says that, "Coding is magic." Did her words surprise you? What do you think she meant?

14 In *CODE*, Kiara Boboff chats with her friends about the gender gap in coding. Have you ever talked to your friends about the gender gap? Your parents? Your teachers?

15 Imagine yourself in college. Do you think things will have changed by the time you get there? What do you envision shifting? Do you think there will still be a gender gap in coding professions?
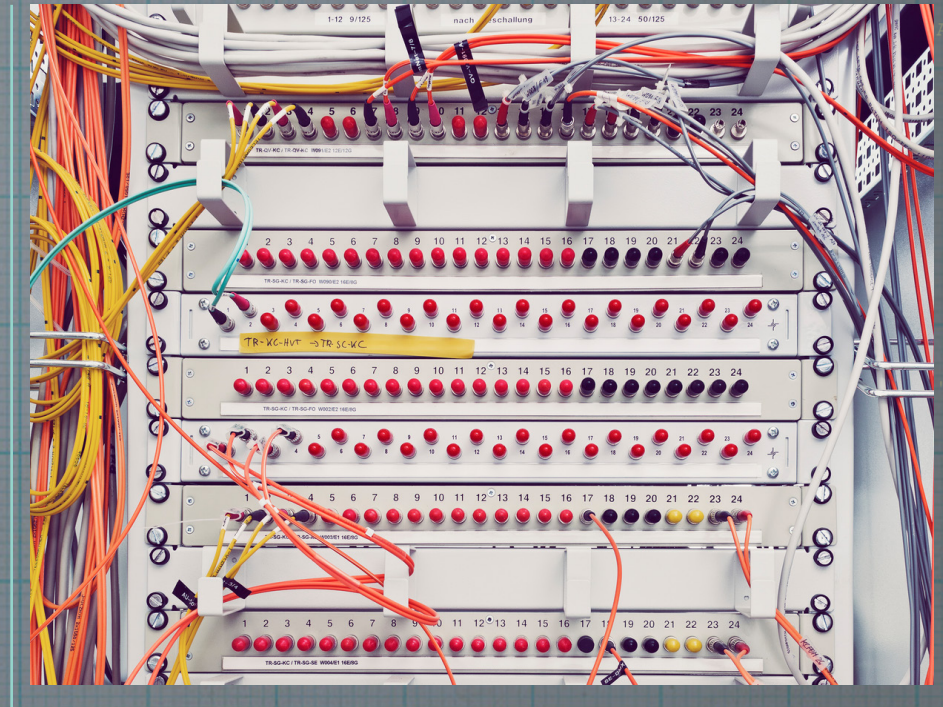
RESOURCES </>

// LEARN MORE

Now that you've seen *CODE*, you're ready for more. The resources below include industry research, blog posts, books, podcasts, infographics, coding education resources, videos and graphic storytelling that can help you dig deeper.

The Catalyst Research Center for Equity in Business Leadership: High Potentials in Tech-Intensive Industries, "The Gender Divide in Business Roles"

GeekWire: "This is How Bad the Gender Gap is at Tech Companies"

Clayman Institute for Gender Research at Stanford University: "Women in Technology"

The Maria Shriver Project: "Why The Tech Sector Struggles To Close The Gender Gap"

Code.Org: "What's Wrong with this Picture?"

PBS *News Hour*: Computer Science's Diversity Gap Starts Early

NPR: Planet Money, Episode 576: "When Women Stopped Coding"

TechRepublic: "The State of Women in Technology: 15 Data Points You Should Know"

The Paley Center for Media: Cracking the Code: Media Portrayals of Women in Science, Technology, Engineering, and Math

Janet Abbate, Recoding Gender: Women's Changing Participation in Computing

Made With CODE

Python Tutorials: Amazing Grace

Medium.com: Tracy Chou, "Where are the Numbers?," Women in Software Database

TEDxGotham 2011: Reshma Saujani, "Girls Who Code"

AAUW: Solving the Equation: The Variables for Women's Success in Engineering and Computing

Verizon: Inspire Her Mind Campaign

The White House: The Untold Story of Women in Science and Technology

// GET INVOLVED

The organizations below represent a sampling of groups that advocate for the closing of the gender gap in computer science. Visit their sites, download their reports, scan their news alerts and use their incredible, collective compilation of resources to expand your study of women in code and augment your post-film conversation.

Anita Borg Institute

Apps for Good

Black Girls Code

Code.org

CODE2040

Code for Progress

Code Now

Digital Undivided

Girl Develop It

Girl Geek Academy

Girls Who Code

National Center for Women & Information Technology

National Girls Collaborative Project

Tech Bridge Girls

Tools for Change

Women Who Code

{she's}coding

shescoding.org

She's Coding is an open-source website project launched in cooperation with the documentary film *CODE: Debugging the Gender Gap*.
She's Coding serves as a destination for anyone who wants to learn more about the gender gap problem in computer science and to become part of the solution. Whether you're a woman currently working in tech; a girl interested in learning to code; a male ally for women in computer science; or a company trying to find ways to increase diversity, She's Coding is an invaluable resource.

// REFERENCES

1 Catherine Hill, Ph.D., Christianne Corbett, and Andresse St. Rose, Ed.D., "Why So Few? Women in Science, Technology, Engineering, and Mathematics," (Washington, DC: AAUW), 2010. [http://www.aauw.org/files/2013/02/Why-So-Few-Women-in-Science-Technology-Engineering-and-Mathematics.pdf], p. 11.

2 "National Center for Women and Information Technology Women in IT: By the Numbers," (Washington, DC: NCWIT), 2014. [http://www.ncwit.org/bythenumbers].

3 "National Center for Women and Information Technology Women in IT: By the Numbers," (Washington, DC: NCWIT), 2014. [http://www.ncwit.org/bythenumbers].

4 "Ready to Work: Job-Driven Training and American Opportunity," (Washington, DC: The White House), July 2014. [https://www.whitehouse.gov/sites/default/files/docs/skills_report.pdf], p. 22 and 72.

5 Catherine Ashcraft, Ph.D. and Sarah Blithe, "Women in IT: The Facts," (Washington, DC: National Center for Women and Information Technology), 2009; rev. 2010. [http://www.ncwit.org/sites/default/files/resources/ncwit_thefacts_rev2010.pdf], p 11.

6 "Current Employment Statistics, Establishment Data, Table B-5b. Employment of women on nonfarm payrolls by industry sector, not seasonally adjusted," United States Department of Labor, Bureau of Labor Statistics. March 6, 2015. [http://www.bls.gov/web/empsit/ceseeb5b.htm].

7 "Ready to Work: Job-Driven Training and American Opportunity," (Washington, DC: The White House), July 2014. [https://www.whitehouse.gov/sites/default/files/docs/skills_report.pdf], p. 22 and 72.

Difference makes a difference

What do all innovators have in common?
They see the world like no one else.

SVB believes that a diverse workplace pushes
us all to think differently and embrace new ideas.

We are proud to champion the ideas of tomorrow, today.

**Silicon Valley Bank is honored to support CODE in raising
awareness of the need for diversity in the technology sector.**

CODE

DEBUGGING THE GENDER GAP

citi VENTURES

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film.sprout