When it comes to STEM, we have a long way to go to balance the equation for girls’ and women’s participation. Girls continue to receive messages that STEM isn’t for them and may be closing the door on STEM careers as early as Grade 8. As a result, girls could be limiting their career potential and pathways, particularly as the economy and workplace evolves. And as a society, we could be missing out on generations of future innovators and problem-solvers.

Girl Guides of Canada set out to explore what the pathways to STEM careers and skills look like for girls under 18, and how this relates to girls’ preparedness for the future of work. From the perspective of girls under 18, we’re talking about the process of girls even getting to the STEM pipeline. Based on our research and what girls told us, we saw doors opening and closing for girls along every step of the way.
GETTING TO THE PIPELINE

What getting to the STEM pipeline looks like for girls

What’s happening as girls in Canada navigate toward the STEM pipeline? Where and why do they opt out – or get shut out?

**CHILDHOOD**
Ages 5 - 12

In childhood, parents tend to believe that boys are better at math and girls are better at reading. Kids begin to internalize gendered stereotypes about math. In elementary school, teachers’ math anxiety is imparted onto girls, but not boys, and impacts girls’ math achievement. At this point, parents believe that math is more difficult for girls than for boys.

**adolescence**
Ages 13 - 14

In adolescence, parents of girls hold stronger gender stereotypes favouring boys in math. In grade 8 or 9, girls have to make critical decisions about high school courses. They’re supported by parents, teachers, and guidance counsellors as they make these choices. Girls in Grade 9 might be more likely to take less advanced math rather than the advanced course despite otherwise being on the advanced academic track.
Opting out for a higher average

In Grade 9, when picking courses for her first year of high school, Layla in Alberta chooses the “10-1” sequence math and science courses – these are the prerequisites for the more advanced Grade 11 and 12 math and science courses needed to apply for most STEM programs. At this point, Layla is on track to be eligible to apply for virtually all post-secondary STEM programs.

But Layla doesn't do well in her math class. She's always had some anxiety about math, and with exams in high school, this becomes even worse. She doesn't want her average to slip by taking “harder” math courses. So, she decides to take the “-2” sequence math (which is less advanced than the “-1” sequence course) to get the prerequisite courses she needs to apply for most STEM programs are open to Layla.

Doors open at each stage of Layla’s journey:

- Decision: Which math and science courses to take
- Peers influence girls' post-secondary choices
- Girls with higher math marks less likely to choose STEM programs than boys with lower marks

Skipping physics

In Grade 10, when picking courses for the next year, Zoey in British Columbia decides to take Biology 11 and Physics 11 because she really likes science. Combined with the math course she’s taking, at this point, Zoey is on track to be eligible to apply for virtually all STEM programs.

When selecting Grade 12 courses, there’s a lot of courses Zoey wants to take. Physics 12 conflicts with another course she’s interested in, so she decides Biology 12 is the only science course she’ll take this year. Besides, Zoey decides she’s more interested in biology since she finds it relates more to helping people and the planet. Because she also took a Grade 12 math course, Zoey is still eligible to apply for a lot of post-secondary STEM programs. But there are many programs she can’t apply to because she didn’t take Grade 12 physics – mainly those in engineering and applied sciences.

Doors open at each stage of Zoey’s journey:

- Decision: Entering post-secondary programs
- Decision: Post-secondary applications
- Girls see themselves as hardworking – not smart – in STEM

Streaming early

In Grade 8, when picking courses for her first year of high school, Romy in Ontario chooses all Academic stream courses. These are the prerequisites for university stream Grade 11 and 12 courses down the line. Romy has never gotten very high grades in math class. She assumes she’s just bad at math. In fact, some people have told her it’s not her strength. So she decides to take the Applied stream math course.

This decision means that it will be difficult for Romy to get the prerequisites for Grade 12 “4U” math courses that are required for most STEM post-secondary programs. Only a handful of STEM programs are now open to Romy.

Doors open at each stage of Romy’s journey:

- Decision: Entering post-secondary programs
- Decision: Post-secondary applications
- Girls see themselves as hardworking – not smart – in STEM

In post-secondary studies, women are twice as likely to switch from STEM to non-STEM programs in the first two years. More than half of post-secondary graduates are women, but women are the minority of STEM graduates (39%). And they’re more likely to be graduating from science and technology (59%) compared to engineering (23%), math (36%), and computer science (30%).

Women with STEM degrees have higher unemployment rates

Women are 39% of STEM grads

Women less likely to graduate from engineering, math, and computer science

Sexism and gender-based harassment at work

Women with STEM degrees more likely to have skills mismatch at work

Decision: Career path

Decision: Staying in program of study or switching

Women twice as likely to switch from STEM to non-STEM

Women with STEM degrees have higher unemployment rates

KEEPING DOORS OPEN: GIRLS, STEM & THEIR FUTURE CAREERS

Keeping Doors Open: Girls, STEM & Their Future Careers
Girl Guides of Canada–Guides du Canada empowers every girl in Guiding to discover herself and be everything she wants to be. In Guiding, girls from 5-17 meet with girls their own age in a safe, supportive and inclusive space to explore what matters to them. Guiding is where girls take the lead, put their ideas into action and jump into a range of empowering activities – all with the support of women mentors committed to positively impacting girls’ lives. We focus on equipping girls with twenty-first century skills that are transferrable to other areas of their life, such as building problem-solving skills through the engineering process, or hypothesizing through forensic science-inspired investigations. Girls in Guiding develop the skills to confidently navigate the world and grab hold of every opportunity that comes their way – now and in the future.

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For inquiries, contact advocacy@girlguides.ca

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