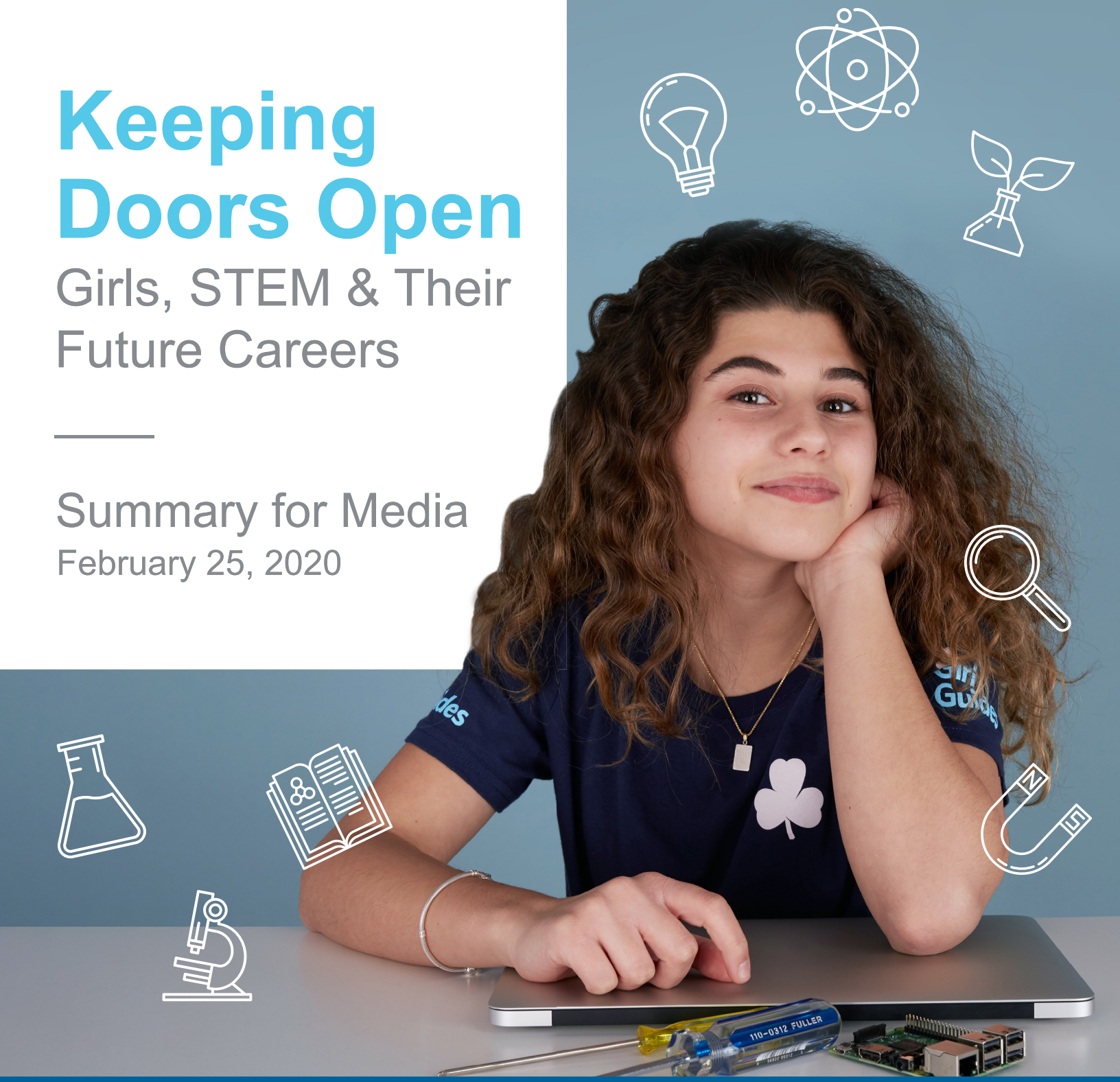
Keeping Doors Open

Girls, STEM & Their Future Careers

Summary for Media

February 25, 2020



MAKING WAVES | GIRL-DRIVEN RESEARCH

Girl Guides

INTRODUCTION

In the coming weeks, Grade 8 students across the country (and those leaving middle school) will face the rite of passage that every graduating student experiences: course selection. The courses students select for Grades 9 and onwards will set them on a path throughout their high school career and ultimately what course of study they can (and can't) pursue in college and university. Along the way, many girls may be inadvertently closing the door on some of the most promising options because they're self-selecting out of advanced math and sciences.

Girl Guides of Canada is releasing research on the factors influencing girls' academic choices – both before and once they enter high school – and how those choices can impact their future careers.

Girls continue to receive messages that science, technology, engineering and math (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 pathways and potential, particularly as the economy and workplace evolves. And as a society, we could be missing out on generations of future innovators and problem-solvers.

It's not new that STEM is an area where girls and women are still sorely underrepresented. This underrepresentation doesn't happen all at once – it happens as girls and women drop off at every step along the path toward STEM educational and career opportunities, something often referred to as the "leaky pipeline."

The key findings 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.

Even when girls pick STEM paths, they show preference for careers that are lower paying among STEM jobs

Girl Guides of Canada conducted both primary and secondary research – including a scan of literature and jurisdictional data, a qualitative analysis of 3,500 girls' drawings about their career dreams, a nationwide survey with 1,000 girls in Canada age 10-18, and focus groups with girls age 12-17. For a full description of the methodology, see the full Keeping Doors Open report.

Girl Guides wanted to understand what getting into the STEM pipeline looks like for girls under age 18 – well before they enter post-secondary studies – and why so many are not pursuing opportunities in these fields.

A closer look at girls' career aspirations reveals that natural and applied science is lower on the list:

Top categories for girls' career dreams, in order of popularity:

1. **Art, culture, recreation and sport**
2. **Education, law, and social, community and government services**
3. **Health**
4. Sales and service
5. Natural and applied science

While some girls *are* thinking of STEM careers, many more express interest in health occupations (which are STEM-adjacent) or occupations in physical sciences or life sciences. Careers in the sciences are the STEM fields which have a greater representation of women, **but they are also lower paying, and tend to have fewer career opportunities without a graduate degree**. Far fewer girls expressed interest in engineering or computer and information system technologies. These are also the areas where women are most underrepresented – and which pay more and have more jobs available.

When looking at who occupies jobs in different STEM fields, Statistics Canada data shows there are clear gender differences: women are mainly concentrated in the sciences, while men are concentrated in engineering, mathematics, and computer science.[1] This is important because engineering, mathematics and computer science have higher median wages than fields like life sciences, where women tend to be concentrated.[2] Engineering and computer science in particular are where the large majority of STEM jobs are concentrated,[3] where graduates tend to have a higher skills match to the job they find post-graduation,[4] and where more opportunities tend to be available without requiring graduate studies. These are also fields that are expected to be elevated in the future economy.

The reality is that there is a huge variety of careers in STEM that most girls – and probably most adults – aren't aware of. Girls are lacking diverse role models and aren't aware that careers in STEM can help society in solving the world's most pressing challenges – and this gap in knowledge might be doing them a disservice by dissuading them from considering these fields.

Gender stereotypes limit career aspirations

There are deeply engrained social norms and stereotypes that tell girls that STEM isn't for them. Girls get these messages about STEM from many sources: parents, teachers, peers, and the media, to name a few.

Girl Guides research found that:

- **One quarter (24%)** of young people age 12-17 agree that boys are more capable than girls of doing things in society such as learning math and science, playing sports, and taking on leadership roles.[5]

- More than **one in ten girls (14%)** age 15-17 say they have faced expectations to follow a career path that is considered traditionally "female," such as nursing, teaching, or social work.[6]

If girls are opting out of science and math classes because they assume they "just aren't good at it," they limit their future career pathways, many without realizing the repercussions this can have on post-secondary program eligibility.

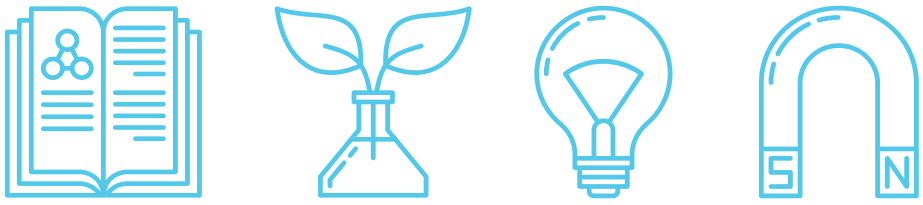
Girl Guides' scan of post-secondary STEM programs in Alberta, BC and Ontario found that:

- Most degrees or diplomas – **roughly three quarters** – require an advanced Grade 12 math course, and nearly all require some Grade 11 or 12 math.
    - While advanced Grade 12 math is more likely to be required for university degrees, more than a third of the college diplomas also required an advanced math course.

- While science courses weren't as widely required as math courses, more than half of the degrees and diplomas also require an advanced Grade 12 level science course, and roughly two-thirds require some Grade 11 or 12 science.
    - Of those that require an advanced level science course, most require physics specifically.

- Looking at the STEM occupations these programs prepare girls for, more than three quarters of the occupations require an advanced level Grade 12 math course, and two thirds require an advanced level Grade 12 science course.

By taking an advanced level math or science course, girls would be eligible to apply for programs that would prepare them for the majority of STEM occupations.



Where are the girls and women in STEM?

Key Statistics Canada data: By the numbers: women and girls in STEM

- *As first-year undergraduate students, women make up:*

63.8% *of non-STEM programs*

56% *of science and science technology programs*

27.6% *of mathematics and computer and information science programs*

19.0% *of engineering and engineering technology programs*[7]

- *Women represent* **59%** *of all university graduates, but they only account for 39% of graduates from STEM programs.*[8]
- **18%** *of women STEM graduates are in occupations requiring a high school diploma or less.*[9]

Conclusion

The goal is not for every girl to enter a STEM field. In fact, it's quite the contrary. At Girl Guides, we believe that every girl should be empowered to explore, discover, and choose everything she wants to be – and for many, this *isn't* STEM. But too many girls today are closing doors to STEM before they really have a chance to explore or know if this *is* the right choice for them.

Through activities like Girl Guides, girls can discover programs and activities that will help them to uncover skills, keep stereotypes in check and meet inspirational women and mentors in fields and industries that girls may never have known existed.

For parents and those who support girls:

- Empowering girls to navigate to the STEM pipeline is about supporting them to make informed decisions about education and careers so that they don't close doors prematurely.
- Debunking harmful norms and stereotypes about what girls can do starts with understanding biases about girls and STEM and encouraging their abilities in these areas.
- Equipping girls to thrive today and in the future means cultivating an environment that welcomes growth and encourages the spirit and joy of learning and exploration, not just top marks.

Girl Guides of Canada–Guides du Canada

Girl Guides of Canada–Guides du Canada (GGC) 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.

Published February 2020

For the full report, visit girlguides.ca/girlsinSTEM

ENDNOTES

1. Darcy Hango (2013). *Gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university.* Ottawa: Statistics Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/75-006-x/2013001/article/11874-eng.htm
2. Ibid.
3. Katherine Wall. (2019). *Persistence and representation of women in STEM*. Ottawa: Statistics Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00006-eng.htm.
4. Hango. (2013).
5. Girl Guides of Canada. (2018). *Sexism, Feminism & Equality: What Teens in Canada* Really *Think*. Retrieved from http://girlguides.ca/letgirlsguide.
6. Girl Guides of Canada. (2017). *International Day of the Girl 2017: Nationwide Survey*. Retrieved from https://www.girlguides.ca/web/GGC/Parents/Girl_Driven_Research/IDG_Nationwide_Survey/GGC/Media/Thought_Leadership/IDG_Nationwide_Survey.aspx
7. Katherine Wall. (2019). *Persistence and representation of women in STEM*. Ottawa: Statistics Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00006-eng.htm.
8. Hango. (2013).
9. Hango. (2013).