Science, technology, engineering, and mathematics (STEM) fields often are associated with the stereotype of being “hard,” “boring,” or “not for me.” Contrary to these stereotypes, careers in STEM fields involve teamwork, creativity, and communication. They often go beyond the laboratory to address current issues our society faces. STEM teams require a variety of people with different skills in order to be successful.

For example, engineering is a creative, engaging, rewarding profession where people solve problems, design solutions, and help local, and global communities. It also requires students to take science and math courses in high school before starting a post-secondary program.

While the young people in your life are starting to make decisions about their future, encourage them to keep STEM options open. Finding role models that help demonstrate what STEM careers involve, and going to events that allow them to try out STEM activities (camps, workshops, open houses) challenge the dominant stereotypes, and are crucial to helping youth make informed career decisions.

Why should your child keep STEM options open?

70% of top jobs require STEM education

But less than 50% of Canadian high school graduates complete Gr. 11 & 12 math and science

Graduates with STEM degrees:
- Earn 26% more on average
- Have better job security
- Earn more than non-STEM graduates, regardless of career

STEM qualifications are in demand

Contribute to solving today’s challenges

The variety of career paths

STEM organizations need new workers:

95,000+ engineering jobs available by 2020 due to retiring employees.

100,000+ environmental sector job vacancies in the next decade.

Why STEM? for Parents & Guardians

3 Reasons to Consider Careers in STEM

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**Unrelated Careers that have STEM prerequisites**

- Computer Technology
- Biology
- Chemistry
- Physics
- Mathematics
- Banking management
- Welding
- Journalism
- Broadcasting services management
- Industrial design
- Crime scene investigation
- Animation
- Early childhood education
- Business administration
- Weather forecasting
- Chef
- Baker
- Fitness/Health
- Transportation management
- Data security analyst
- Agriculture/Agriculture
- Carpentry
- Dietitian/Nutritionist
- Architecture management
- Data security analyst
- Agriculture/Agribusiness
- Carpentry
- Dietitian/Nutritionist
- Architecture
- Forestry
- Psychology

**STEM Self-Efficacy**

4 Factors Affect Self-Efficacy

- Social Persuasion: Feedback, support and judgment from others (especially influential figures - parents, teachers).
- Mastery Experiences: Has done the task before. Had a chance to learn & practice strategies to do task effectively.
- Physiological Factors: How a person interprets their emotional/physiological state. E.g., butterflies, nerves.
- Vicarious Experiences: Learning by observing others doing the task. Role models are important for this.

Self-efficacy influences the choices we make in terms of:

- **goals** we choose
- **how much effort** we put into pursuing them
- **our persistence** when difficulties arise.

The most influential source of STEM self-efficacy:

- **Boys**: Mastery Experiences
- **Girls**: Social Persuasion, Vicarious Experiences

Middle school girls’ science self-efficacy is lower than boys, & they are more anxious about science performance despite achieving higher grades overall.

**Self-Efficacy**

- **a person’s belief in their ability to perform a task**
- **in STEM disciplines**

**Perceptions of STEM Professions**

Middle school students were asked to draw an engineer... 

- **76%** of students say their parents have the greatest influence on their educational direction.
- **28%** of parents talk to their children about the value of optional STEM courses.

Pressure to succeed:

Supporting a narrow range of careers:

- Restricts your child’s ability to explore alternative careers. Only students are second at 24%)

28% of parents say their child’s decisions & experiences inform your child’s decisions.

- Middle school girls' science self-efficacy is lower than boys, & they are more anxious about science performance despite achieving higher grades overall.

**STEM Careers are not Their Stereotypes**

- **Middle school girls**' drawings of scientists were more stereotypical than Gr. 5 students’

- **28%** of parents talk to their children about the value of optional STEM courses.

**What Can We Do?**

- **Encourage your child to pursue a broad range of activities and interests.**
- **Help your child build self-efficacy, not just self-confidence.** Give them opportunities outside of class to try new things, and work on mastery. Be a role model to your child. Try new things. Talk about STEM at home. Consider family outings to STEM destinations, pursuing hands-on activities and do-it-yourself projects at home, and discussing STEM topics on TV or the news.
- **Expose your child to STEM careers through role models, mentors, workplace visits, the media, summer camps, and career days.**

When you see stereotypes in person or in the media, challenge them. Discuss stereotypes with your child. Emphasize that each of us is unique, and have different strengths. Stereotypes do not define us. If your child appears to be opting out of STEM, encourage them to keep their options open. People with STEM backgrounds are very successful in other fields, but it can be hard to move into STEM if you have opted out of math and science in school.

Overall, take the time to learn about what real STEM careers involve, and provide opportunities for your child to try them out.
References

Recommended Readings

About WWEST
Westcoast Women in Engineering, Science & Technology 2010-2015 (WWEST) is the operating name for the NSERC Chair for Women in Science and Engineering (CWSE), BC and Yukon Region. Our mission is to advance engineering and science as welcoming careers that serve our world through holistic understanding and creative, appropriate and sustainable solutions. WWEST works locally and, in conjunction with the other CWSE Chairs, nationally on policy, research, advocacy, facilitation, and pilot programs that support women in science and engineering.

About the Chairholder
The 2010-2015 Chair was held by Dr. Elizabeth Croft, P.Eng., FEC, FASME. Dr. Croft is the Associate Dean, Education and Professional Development in the Faculty of Applied Science, and a Professor of Mechanical Engineering at the University of British Columbia. She is also the Director of the Collaborative Advanced Robotics and Intelligent Systems (CARI) Laboratory. Her research investigates how robotic systems can behave, and be perceived to behave, in a safe, predictable, and helpful manner. She is the lead investigator of “Engendering Engineering Success,” a 3-year interdisciplinary research project that aims to take an evidence-based approach to increasing the retention of women in engineering by understanding and changing aspects of workplace culture that place women at a disadvantage.

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