

STEM and the people we learn from

Conversation Guide



**Let's Talk About
the Future of STEM
Education in Canada**

This guide has everything you need to start a conversation about the future of STEM education in Canada and help young people's voices be heard. So... let's talk!

WHY THIS IS IMPORTANT...

Have you heard of STEM? It stands for Science, Technology, Engineering and Math. STEM related subjects are where you study or use knowledge and skills related to these topics.

You probably know that you need STEM in order to be a doctor, engineer, web developer or architect, but did you know that a background in STEM will be essential for high demand jobs in the next few years? Careers in business and banking, in trades like welding or electrician, in the arts, helping people in the community, and even in government, all need some STEM background. In fact, **over 70% of jobs in Canada will need STEM-based knowledge or expertise** – and this number will only continue to grow in the future.

Despite this fact, **less than 50% of students graduate high school with the STEM background** needed to pursue post-secondary STEM

education and jobs. This means that today's students may not have the knowledge and skills needed to get top jobs (top refers to a combination of factors including personal job satisfaction, high starting salary, most respected professions, recession proof and job of the future).

Given the increasing pace of technologically-driven change, now is a great time to rethink STEM in schools. Today we're hoping you can help us design a better way to teach and learn STEM by hosting a conversation that captures the opinions and experiences of young people. We will use your opinions and experiences to **help shape the future of STEM education in Canada** as part of the **Canada 2067** initiative.

HOW TO USE THIS CONVERSATION GUIDE

This guide is meant to help you, as a facilitator, host a conversation with young people (primarily between ages 14-18) about the future of STEM education in Canada. It's meant to be flexible and adaptable to fit your circumstances. Be sure to read through it before you host your conversation.

First off, think of this as a guide, not a script! You know your day-to-day experiences more than anyone else, so if you need to adapt the guide to report on your particular circumstances, then go for it. While this guide was written primarily for use with students in secondary school careers, civics or STEM-related classes, you may wish to use it in other ways with other groups, such as after-school clubs, or in non-STEM related classes.

The most important thing is to capture the main ideas from your conversation and share them with us. Choose at least one dedicated note taker to help you during the conversation. This could be a

volunteer/ student /participant, or another colleague. We've provided a workbook that can be used either for taking notes during your session or for consolidating insights afterwards. You may wish to make copies of it for participants to look at and use during the conversation, though this is not necessary.

Share your conversation notes with us **as quickly as you can** (the deadline for submissions is the end of the 2016-2017 school year, but the sooner you submit the more opportunities there will be to get involved). **Your note taker can take notes directly into an online form at canada2067.ca/youthvoice** or you can submit them later on the website, or by sending us back the workbooks in the mail. We're listening - we want to hear what young people are thinking, feeling and saying so capture as much detail as you can. It will all help inform the future of STEM education in Canada.

WHAT HAPPENS TO YOUR RETURNED CONVERSATION NOTES

We'll read all the conversation notes from across Canada looking for themes and patterns to inform the Canada 2067 Learning Framework: a knowledge-based list of priorities for action for education that will shape and prioritize science, technology, engineering and math (STEM) learning over the next fifty years. The collaboratively developed Framework will be shared at the Canada 2067 Conference in December 2017 and will inform the implementation of a consensus-based action plan to bring the participants' wisdom to life.

While excerpts of conversations submitted may be shared publicly, and statistics based on the data gathered from certain questions may be released, anything shared will not be attributed to individuals or institutions.

P.S. : If you enjoy this guide, there are two others that cover different topics related to the future of STEM education in Canada. Find them on Canada2067.ca and have your say as many times as you like!

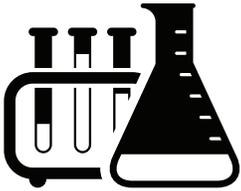
CONVERSATION PLAN

Time needed : 50-70 min

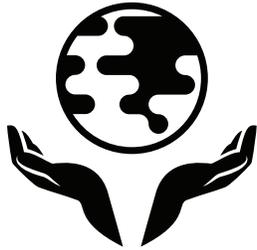
Details	Minutes	Resources
Introduction to topic <ul style="list-style-type: none">• What we'll be doing today• What is STEM• Why is STEM important• Why is this conversation important	5	Use the Conversation Guide for key information to share p. 1 <i>Why this is important</i> & p. 4 <i>Explain this exercise to participants</i>
Discussion questions on Learning and STEM <ul style="list-style-type: none">• Yes/No questions on STEM• Yes/No questions on youth opinions• Brief discussion on questions that piqued interest of participants	10 – 15	p. 5 & 6 of Conversation Guide for facilitator notes p. 2 of Workbook to record answers
Learning Outside the Classroom <ul style="list-style-type: none">• Introduce topic• Discussion as large group, small groups, or <i>think-pair-share</i>	10 – 15	p. 8 of Conversation Guide for facilitator notes p. 4 of Workbook to record answers
Mentors and Role Models <ul style="list-style-type: none">• Introduce topic• Discussion as large group, small groups, or <i>think-pair-share</i>	10 – 15	p. 8 of Conversation Guide for facilitator notes p. 5 of Workbook to record answers
Teachers <ul style="list-style-type: none">• Introduce topic• Discussion as large group, small groups, or <i>think-pair-share</i>	10 – 15	p. 9 of Conversation Guide for facilitator notes p. 6 of Workbook to record answers
Let's Wrap it up <ul style="list-style-type: none">• Final set of Yes/No questions• Discuss any of interest• Discuss next steps & importance of initiative	5	p. 9 of Conversation Guide for facilitator notes and p. 7 of Workbook to record answers

EXPLAIN

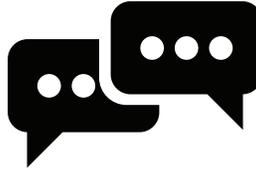
THIS EXERCISE TO PARTICIPANTS:



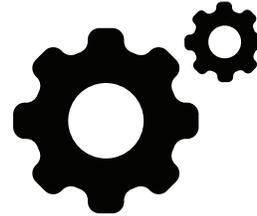
STEM stands for Science, Technology, Engineering and Math. STEM related subjects are where you study or use knowledge and skills related to these topics.



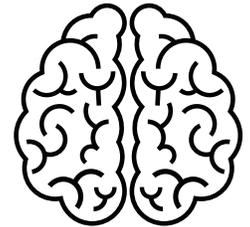
Thousands of other young people just like you across Canada from coast to coast to coast are sharing their ideas in similar conversations about the future of STEM.



Together, your voices and ideas will help change how students learn STEM. If enough people like you share their ideas, things can and will change for the better.



This is your chance to have your say on what you think is important to learn in school. Your voice can help shape how, when, where and what young people learn.



We're going to work through a series of exercises and discussions together. Don't be shy to tell us what you really think; we're listening!

During these discussions, encourage participants to:

1

Be open, honest and imaginative when thinking about the questions and their answers.

There are no right or wrong answers, although be polite and respectful.

2

Forget about today's reality and dream big!

Think about how much things have changed recently and imagine how much they will continue to change in the future.

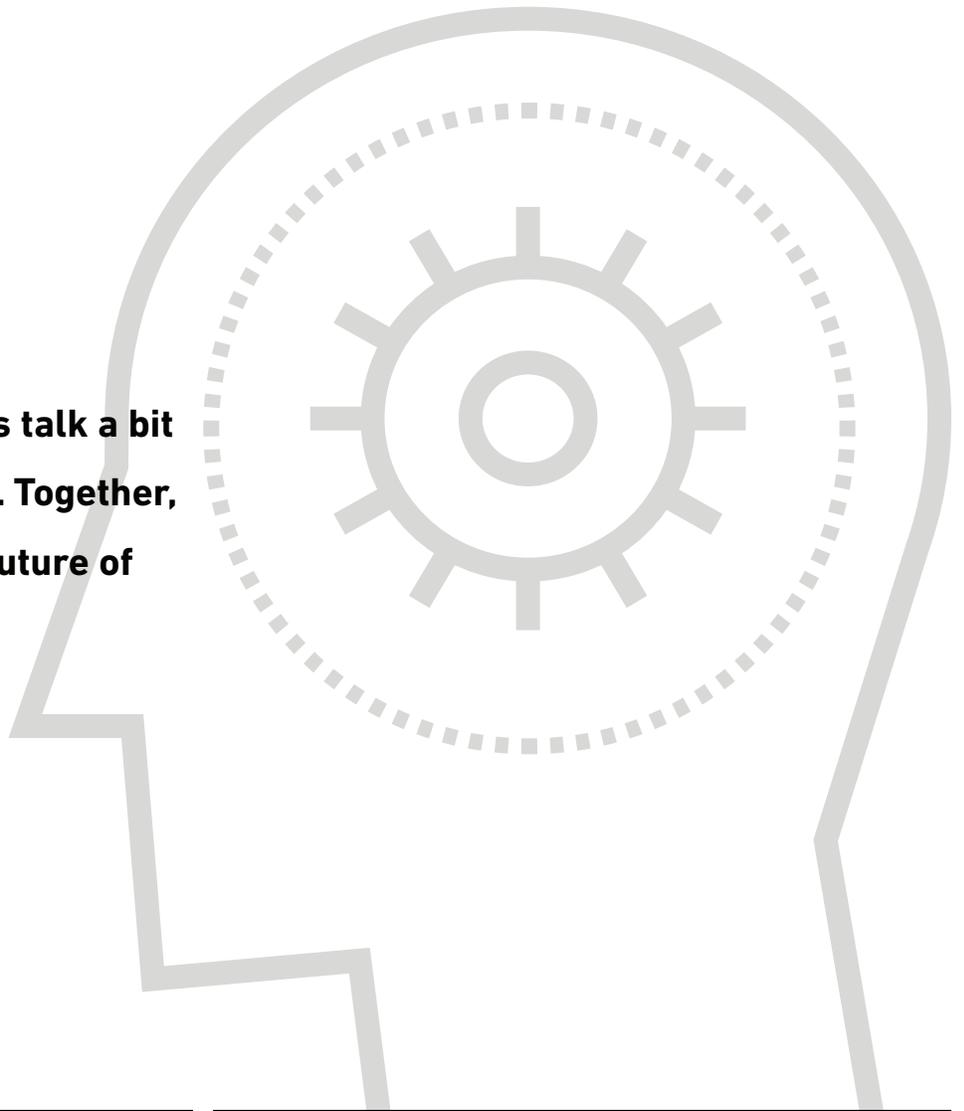
3

Take it to heart.

This is an opportunity to influence the next generations in a positive way. It's not often you're asked to contribute to a brighter future for Canada's youth, be thoughtful.

LEARNING AND STEM

Let's get warmed up! First, let's talk a bit about learning and STEM today. Together, our voices can help shape the future of STEM education in Canada.



Learning Goal

- These questions are designed to give us some basic information about young people's knowledge of STEM in the work world, as well as their experience of being asked about school and learning.

Instructions

- You may wish to couple this section with additional warm-up discussions or activities as appropriate, such as an icebreaker for a group that does not yet know each other, some general STEM careers information, etc.
- Make sure you've designated a note taker to capture and submit their notes online during the conversation. If you don't have a computer and connection to the internet during the conversation, use our workbook (available at canada2067.ca) to collect the insights. You can also submit them online later or mail them in. Either way, don't forget to submit your results by the end of the 2016-2017 school year!

Note to facilitator:

Ask participants to raise their hands for 'yes' / 'no' and have the notetaker record the number of hands raised for each question in the workbook. If time allows, **you may wish to encourage some discussion of questions of interest afterwards.**

Did you know that over 70% of all future jobs in Canada will need STEM-based knowledge or expertise?

Yes/No

Did you know that less than half of students graduate high school with the STEM background needed to pursue post-secondary STEM education and jobs?

Yes/No

Does that fact surprise you?

Yes/No

Do you think there could be changes made to the way STEM is taught and experienced in school that would increase the number of students who choose to stick with STEM?

Yes/No

Note to facilitator:

As a lead-in to the next two questions, remind participants that the purpose of today's discussion is to gather young people's opinions and experiences to help shape the future of STEM education.

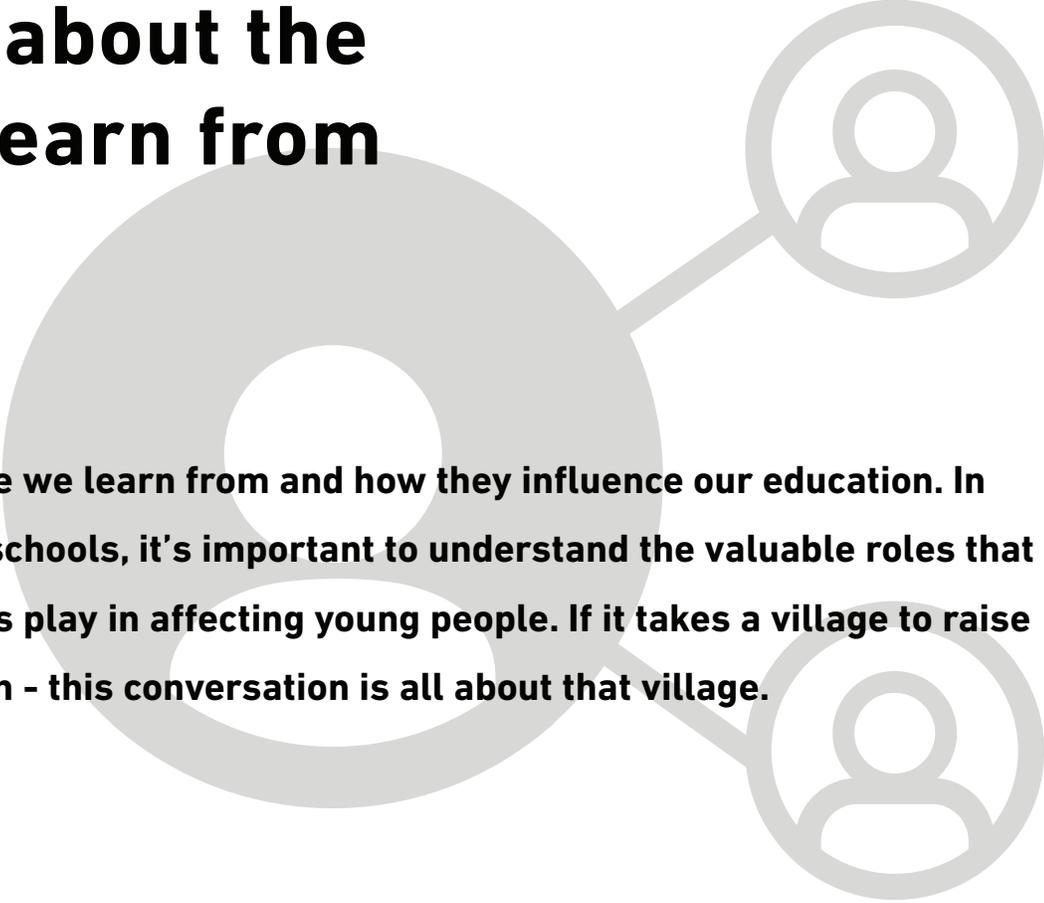
Has anyone ever asked you what you think is important to learn in school?

Yes/No

Do you wish you would be asked about what you think of school more often?

Yes/No

Let's talk... about the people we learn from



Let's talk about the people we learn from and how they influence our education. In order to change STEM in schools, it's important to understand the valuable roles that people in our communities play in affecting young people. If it takes a village to raise a successful young person - this conversation is all about that village.

Learning Goal

Gather examples of:

- Learning opportunities outside of the classroom
- The influence of mentors and role models
- Ways that teachers positively affect learning

Instructions

- Introduce the three discussion topics – learning outside the classroom, mentors and teachers.
- Each topic should take about 10 – 15 minutes.

Let's talk about learning outside the classroom



Note to facilitator:

As you move into the next section, you may wish to use different structures to support the discussion depending on the size of the group, room layout, etc. Potential options might include:

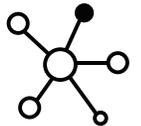
- Think-pair-share (participants take a moment to think alone, share with another person in a pair, then share as a pair with the group)
- Small group (3-4 people) discussions, with or without a note taker in each group, with or without sharing with the overall group
- Open large group discussion

For more detailed facilitation tips, check out our hosting guide at canada2067.ca/youthvoice Whatever structures you use, be sure to include note taking on the key points of the discussion so that your participants' ideas and thoughts can be shared with us. All recorded conversations will influence the future of STEM education in Canada.

Think about a time in your life when you participated in a learning activity outside of school. Maybe you've volunteered, had a part-time job, went on a field trip, a special lecture, an on-site demonstration... If you can't think of a place outside of school, think about a time this happened in school. Think about what you were doing, when and where this happened and who was involved.

- 1 What, if anything, made this experience different than learning activities in the classroom with your teachers?
- 2 What did you get out of this experience?
- 3 Do you wish you could do more of this kind of learning? Why or why not?

Let's talk about mentors and role models



Note to facilitator:

This is a great opportunity to introduce some new ways of thinking about the topic at hand to your participants by engaging in a brief opening discussion about mentors and role models more generally. You could discuss what a mentor or role model is, and who participants' mentors and role models are in different contexts (e.g. at home, at work, at school). Although your participants may look up to their friends as peer role models, what we would like to focus on are the people outside of their peer group to whom they have a connection or with whom they have a relationship.

There are lots of different people who we look up to and who influence our learning in different ways. Think about all the different people who affect you outside the classroom: teachers, parents, siblings, coaches, bosses, authors, athletes, musicians, etc.

- 1 Outside of your friends, who do you look to for help and encouragement with learning?
- 2 What do you think makes them so influential?

Being guided by someone with more expertise is sometimes called mentorship. How could mentorship be incorporated into STEM education of the future?
- 3 Describe one or two ways you think this type of mentorship and influence could be incorporated into STEM subjects.
- 4 Describe one or two ways you think this type of mentorship and influence could be incorporated into STEM subjects.

Let's talk about how teachers play a role in your learning



Note to facilitator:

If you're a teacher, you may wish to leave the room during this part of the conversation, to encourage students to be as open and honest as possible. Remind the students that this exercise is meant to focus on the positive – celebrating when teachers have had a more positive impact, as opposed to 'bashing' or dwelling on negative experiences. The goal here is to highlight the positives, so that in the future of STEM there can more of that type of learning.

Think about a time that a teacher made a positive impact on your learning experience of a STEM-related subject like science, math or technology. If you can't think of a STEM-related subject, think about another subject.

- 1 Try to remember as much detail as you can: what was the subject? When and where did this happen? Who was involved? Describe what happened.
- 2 What made this experience different from other experiences you've had?
- 3 How did your teacher make you feel?
- 4 Why does it stand out?
- 5 What did you get out of this experience?

Let's Wrap It Up!



Note to facilitator:

You may wish to have participants put up their hands for each answer and have the notetaker record the number of hands raised in the workbook. If time allows, **you may wish to encourage some discussion of questions of interest afterwards.**

- 1 How interested would you be in taking a class where you try out different jobs in your community? You don't get to choose which jobs you're placed at.
1 = not at all interested, 2 = somewhat interested, 3 = interested, 4 = very interested, 5 = extremely interested.
- 2 Do you think STEM classes at school should include a chance to learn through volunteering in the community?
Yes / No
- 3 Would you want to be matched with a mentor who you could meet with to talk about STEM and your future?
Yes / No
- 4 Do you wish you had more of a say about how teachers were teaching STEM?
Yes / No

NEXT STEPS

How to close out the discussion with participants:

You did it! Thanks for taking the time to be a part of this conversation. Be proud that your voice is making a difference and helping build a bright future for Canada’s young people. Submit your conversation online at: canada2067.ca/youthvoice or mail your workbook to:

Canada2067 Research Team
 H&K Strategies
 55 Metcalfe St #1100
 Ottawa ON K1P 6L5

WHAT HAPPENS NEXT:

If you and your students found this conversation and topic interesting, you can stay involved in a number of ways:

- Host another conversation (there are 3 subject areas). Details at: canada2067.ca/youthvoice
- Apply to join us at the Canada 2067 Conference, or live stream some events with your class: canada2067.ca/conference
- Suggest others have conversations and share hosting details with colleagues
- Stay involved through social media at :



facebook.com/Canada2067



[@Can2067STEM](https://twitter.com/Can2067STEM)

HOW YOUR CONVERSATION WILL HELP CHANGE HAPPEN:

<p>Gather ideas about STEM learning from: Students, Teachers, Parents, Government, Industry</p>	<p>Develop a vision and framework for innovation in STEM learning</p>	<p>Canada 2067 conference to share vision and launch initiatives to get there</p>	<p>People across Canada join together and make STEM accessible and relevant to all students</p>
<p>TALK</p>	<p>→ THINK</p>	<p>→ SHARE</p>	<p>→ DO</p>



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