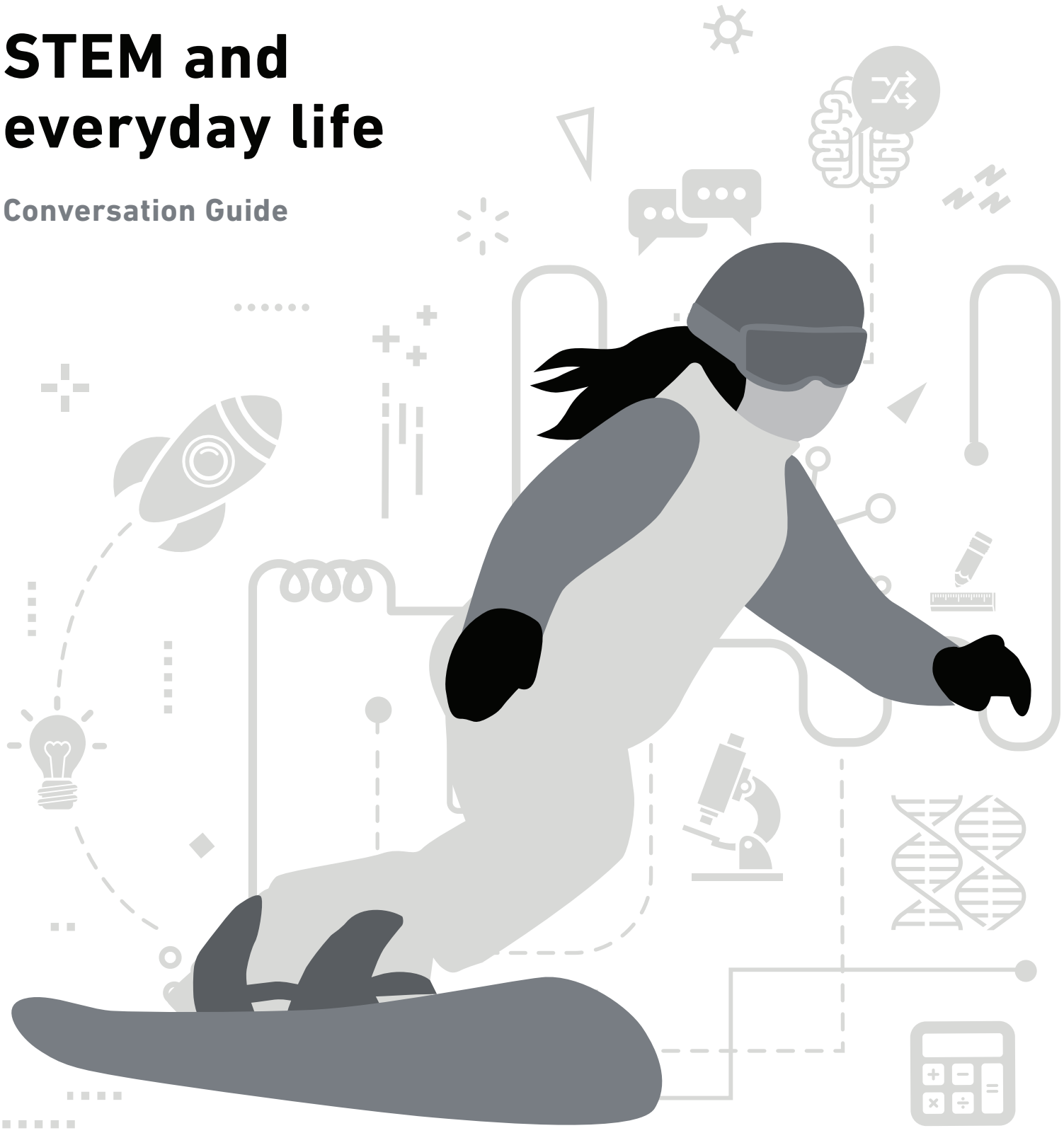
STEM and everyday life

Conversation Guide



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

canada2067

The science of a successful tomorrow

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!

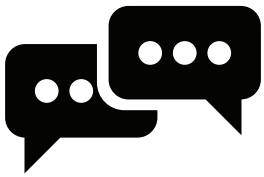
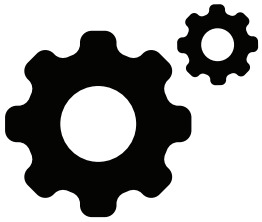
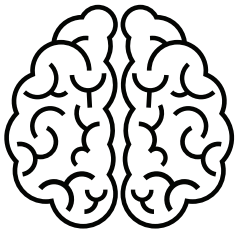
CONVERSATION **PLAN**

Time needed : 50-70 min

Details	Minutes	Resources
Introduction to topic • 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 *Why this is important* & p. 4 *Explain this exercise to participants*
Discussion questions on Learning and STEM • 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
STEM in your everyday life • Introduce topic • Discussion as large group, small groups, or *think-pair-share*	**10 – 15**	p. 7 & 8 of **Conversation Guide** for facilitator notes p. 4 of **Workbook** to record answers
Success in STEM beyond grades • Introduce topic • Discussion as large group, small groups, or *think-pair-share*	**10 – 15**	p. 8 of **Conversation Guide** for facilitator notes p. 5 of **Workbook** to record answers
Getting inspired by STEM • Introduce topic • Discussion as large group, small groups, or *think-pair-share*	**10 – 15**	p. 9 of **Conversation Guide** for facilitator notes p. 6 of **Workbook** to record answers
Let's Wrap it up • Final set of Yes/No questions • Discuss any of interest • Discuss next steps & importance of initiative	**5**	p. 10 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!

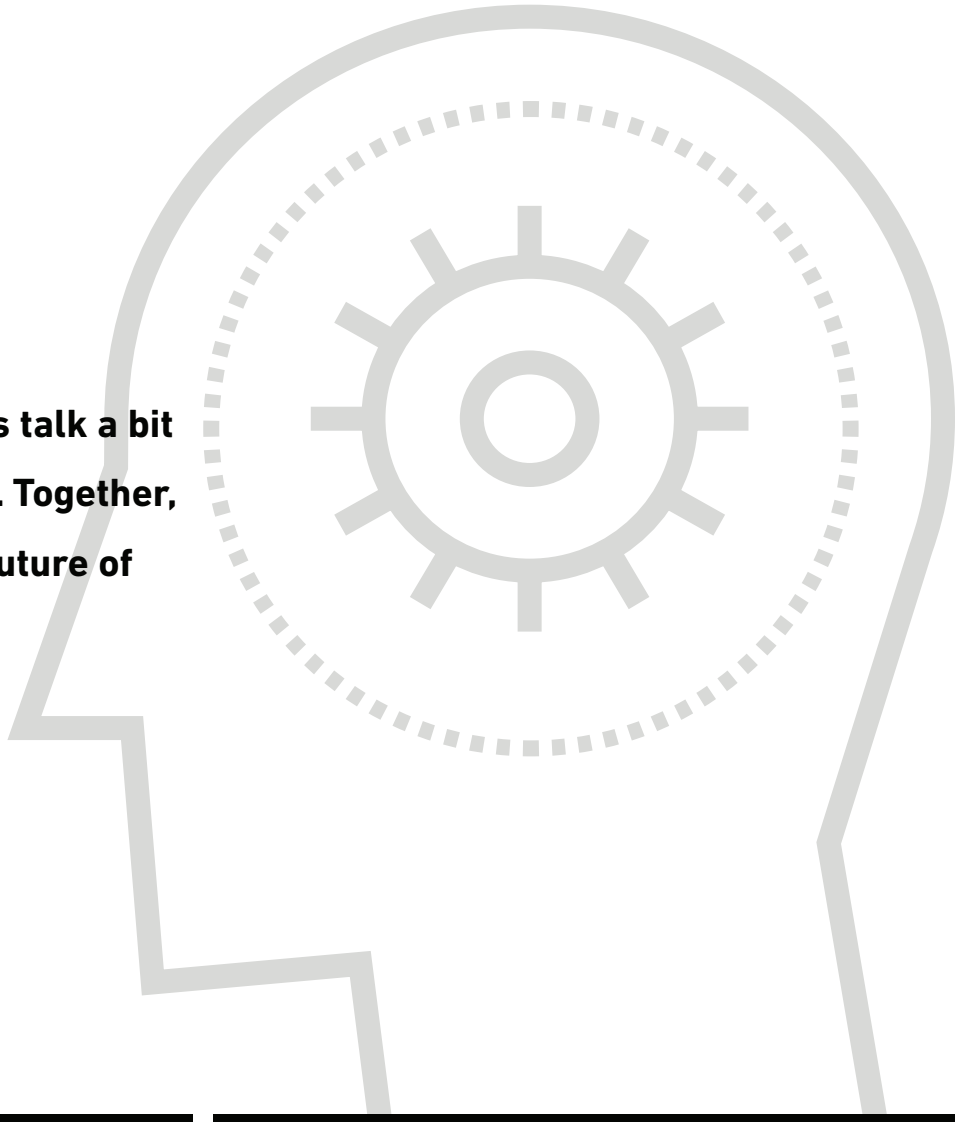
During these discussions, encourage participants to:

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

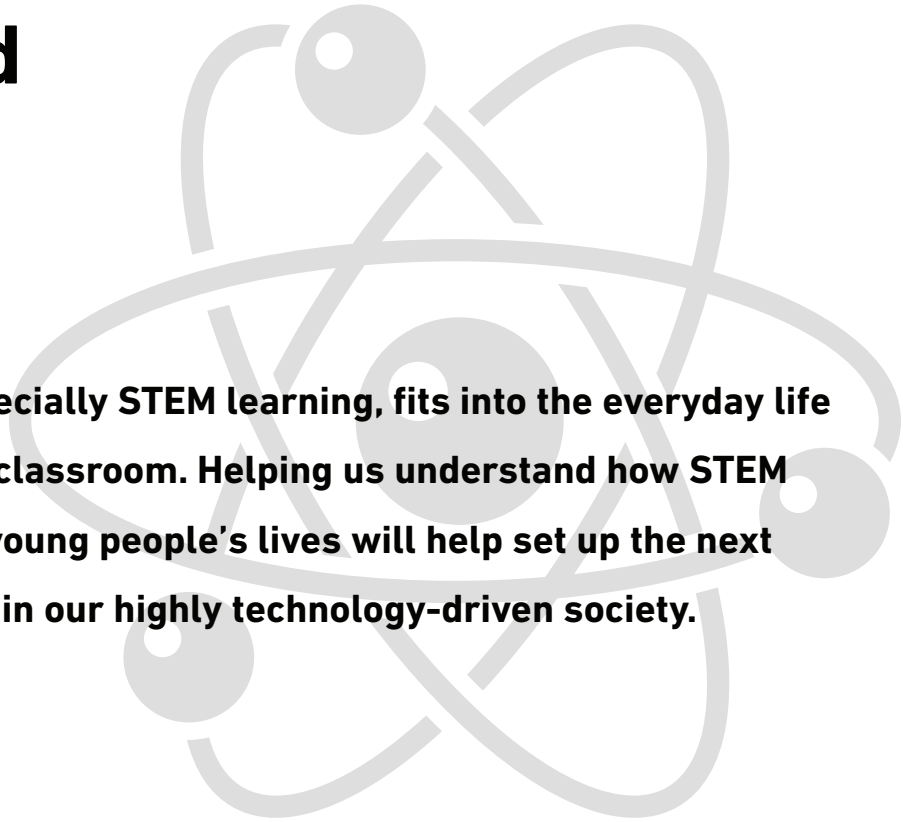
Do you think there could be changes made to the way STEM is taught and experienced in school that would increase the number of students who choose to stick with STEM?
Yes/No

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 STEM and everyday life



Let's talk about how learning, especially STEM learning, fits into the everyday life of young people, even beyond the classroom. Helping us understand how STEM education fits and doesn't fit into young people's lives will help set up the next generation of students to succeed in our highly technology-driven society.

Learning Goal

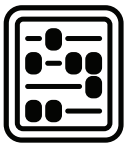
Gather examples of:

- Times when STEM has been relevant to everyday life;
- Anything STEM-related that young people would like to know more about;
- What happens when students feel successful regardless of marks;
- Moments when young people have felt inspired, hopeful or curious about STEM.

Instructions

- Introduce the three discussion topics – STEM and everyday life, success beyond grades and getting inspired by STEM.
- Each topic should take about 10 – 15 minutes.

Let's talk about STEM in your everyday life



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 (e.g., breaking participants into pairs, then having each pair share with another pair before sharing with the wider group)
- Small group (3-6 people) discussions, with or without a note taker in each group, with or without cross-sharing with the overall group
- Open large group discussion

For more detailed facilitation tips, visit **canada2067.ca/youthvoice**. Whatever structures you use, be sure to have some means of taking notes on the key points of the discussion so that your participants' ideas and thoughts can be shared with us in order to help influence the future of STEM education in Canada.

Think about what you've learned so far in STEM-related subjects over the years in school. Think about all the different courses you've taken that relate to science, technology, engineering, math and related subjects.

1 What's been the most useful STEM topic or concept you've learned so far that you could use in your everyday life? Why has that been useful? How does it relate to everyday life?

2 Is there anything you've learned so far in STEM-related subjects that you wish you could learn more about in school?

3 If so, what? Why do you think there wasn't or isn't more of that taught today?

Let's talk about success in STEM beyond grades

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 success more generally. This can help expand students' mental models of these concepts and make for richer discussion of the questions. For more facilitation tips, visit **www.canada2067.ca**

Think about a time in a STEM-related subject that you felt you had succeeded at something, no matter what grade or mark you received. If you can't think of a time in school, think about a time outside of school. If you can't think of anything STEM related, you can use an example of another time you feel you really succeeded in a subject, no matter what grade or mark you received.

1 Describe what happened. What was the subject? When and where did this happen? Who was involved?

2 What made you feel like you had succeeded?

3 How, if at all, did this feel different than when you've received a high mark?

Note to facilitator:
Read the following list out loud first to give participants the options. You may also wish to write the list out where it is visible. Then ask participants to vote by raising their hand up to three times to indicate the options they feel are most important. Record how many hands were raised for each option. Participants may also vote in their smaller working groups, depending on structure and set-up of the room.

Thinking about your previous answers as well as other experiences you've had, what do you think are the most important ways of measuring success in STEM-related subjects other than grades?

1. Feeling of personal accomplishment
2. Feeling that I understand more about how the world around me works
3. Praise from teachers
4. Praise from parents/guardians
5. Praise from friends
6. Knowing I can use what I learned outside of school
7. Knowing I can use what I learned in other classes
8. Other (record other possibilities)

Let's talk about getting inspired by STEM

Note to facilitator:
This is an opportunity for students to discuss youth-led change with their peers, and get inspired about possibilities and creating change.

Think about something that happened in a STEM-related class that made you feel inspired. Maybe you felt excited about your possible career choices, or what comes after school, or just generally inspired by the world and curious to find out more.

1. Describe what happened. What class was it? When and where did this happen? Who (if anyone) was involved?
2. Why did it make you feel inspired?
3. Are you doing anything differently because of what happened? If so, what?
4. What was the role of your teacher (if any)?

Note to facilitator:
Read the following list out loud first to give participants the options. You may also wish to write the list out where it is visible. Then ask participants to vote by raising their hand up to three times to indicate the options they feel are most important. Record how many hands were raised for each option. Participants may also vote in their smaller working groups, depending on structure and set-up of the room.

Thinking about your previous answers, as well as other experiences you've had, what do you think would make you more inspired in STEM-related classes or want to take more STEM related classes?

1. Technology in class
2. Hands-on and practical learning
3. Field trips
4. More information about STEM jobs and careers
5. Hearing stories from and/or being visited by STEM professionals (people who work in STEM related careers or use STEM in their jobs)
6. More exploration of real-life STEM-related successes
7. More opportunities to shape your own learning by focusing on things that you want to know about or do
8. Other (record other possibilities)

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 are you in taking a general STEM course that would help you understand everyday life, but might not prepare you for a specific STEM career? In the course you may learn basics like: introductory anatomy so you better understand how your body and your health work, easy technical skills so that you can fix things around the house, coding for websites or math that will set you up for budgeting your business.

You may wish to ask participants to use their fingers to show their level of interest, or read out the options and have them raise their hands for the appropriate answer, from 1 = not at all interested, 2 = somewhat interested, 3 = interested, 4 = very interested, to 5 = extremely interested.

2 Do you think there's a better way to measure success in STEM related subjects that is different from how you are currently evaluated?

Yes/No

3 In general, how inspired, hopeful or curious do you feel about STEM-related subjects today?

You may wish to ask participants to use their fingers to show their level of interest, or read out the options and have them raise their hands for the appropriate answer, from 1 = not at all interested, 2 = somewhat interested, 3 = interested, 4 = very interested, to 5 = extremely interested.

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

HOW YOUR CONVERSATION WILL HELP CHANGE HAPPEN:

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

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