

Facilitator Guide

Challenge 2
Tools & Spaces

**Let's Imagine the
Future of STEM
Education in Canada**



Presented by



Mars Startup School Challenge developed by



**INSTITUTE WITHOUT
BOUNDARIES**

Mars Startup School materials were produced by Groundswell Projects and the Institute without Boundaries for Canada 2067, an initiative by Let's Talk Science, a national, charitable organization that is focused on education and outreach to support Canadian youth.

For more information on Canada 2067, please visit: www.canada2067.ca

This guide has everything you need to lead your team through the Mars Startup School Challenge and help young people's voices be heard.





Welcome to the **Mars Startup School.**

Schools need to innovate and young people have solutions. Mars Startup School is a Canada2067 initiative to engage students from across Canada to reimagine school from the ground up, with a particular focus on STEM (Science, Technology, Engineering & Math) education.

As a facilitator, it is your role to lead the team through the Mars Startup School Challenge, encouraging creativity and collaboration as students reimagine components of the school system to better meet their needs.

This mission requires courage, curiosity and creative thinking.
Let's blast off and get started!

The Startup Design Kit.

Designing a new education system is not an easy task, so we created the following tools and templates to help your team through the Challenge:

1 Student Workbook.

The *Student Workbook* is the students' guide through this Challenge. It includes all the information required to develop and communicate their ideas.



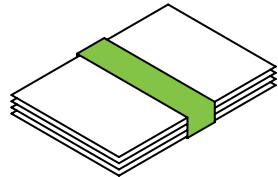
2 Worksheets.

The *Worksheets* will help your team organize your ideas as they design a component of Mars Startup School. They build on one another to ensure your team creates a solid concept.



3 Precedents Cards.

Precedents Cards showcase projects from around the world to provide inspiration and spark creativity within your team. These can be helpful at any point in the process.



Note to facilitator: This facilitator guide includes all the same content as the student workbook and worksheets, with some added tips and tools to help you guide your team in the right direction.

Mars Startup School Challenge.

Here are the steps your team will follow to design a component of the Mars Startup School and totally reimagine STEM education. Let the Challenge begin!

1

Meet Your Team! (25 min.)

Meet Your Team! Get to know your teammates, their special talents and their passions.

2

Design Criteria. (40 min.)

Focusing on a component of Mars Startup School, your team will define design criteria, which will create a framework for your design concept.



3

Concept Design. (60 min.)

Building on your design criteria, your team will design a solution, experience or team that will transform STEM education.



4

Share. (45 min.)

Your team will summarize and share their ideas with Mars Startup School teams who have worked on different components of the school. This is an opportunity to discuss how the ideas work together.

Note to facilitator: As the facilitator it will be up to you to ensure the team stays on track and completes each step of the Challenge. Detailed instructions are provided for each step, but don't be limited to the tools and questions provided. Encourage your team to be creative and have fun!

Step One.

Meet Your Team!



Teamwork and collaboration are key to the success of this Challenge. Spend 25 minutes to get to know your team.

1. Introductions (5 min.)

Get to know each other and the special talents each team member will contribute to Mars Startup School. Quickly go around the table and share:

- Your name
- Where you go to school
- One special talent/strength

Take note of everyone's special talents because this can be helpful in the design process.

2. Play a Game (10 min.)

Two truths and a lie is a great game to help break the ice and loosen the mood on your team.

- Have everyone write 2 truths and one lie on Post-its
- Go around the table and have members of the team guess the lies

Make sure everyone at the table has a chance to play before moving on to Step 2.

3. Discuss Your Vision for Mars Startup School (10 min.)

Before your team gets down to work, take a few minutes to think about how cool this challenge is... to design a Startup School on Mars. Ask your team to imagine the possibilities. In what ways will the school they build on Mars be different from their school here on Earth? Ask students to write down the ideas that first come to mind on Post-its and discuss as a group to get their creativity flowing. Make sure to take notes.

Note to facilitator: When facilitating the team introductions, make sure to introduce yourself! Your participation in this is essential to creating an inclusive, non-hierarchical team. This is an opportunity to briefly describe your role in the Mars Startup School Challenge.



Brainstorm Tips & Rules.

Here are a few brainstorming tips to point out before your team begins imagining Mars Startup School:

■ **Be open, honest and imaginative.**

When completing the Challenge there are no right or wrong answers. Always be polite and respectful.

■ **Forget about today's reality and dream big!**

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

■ **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.

Note to facilitator: After the team gets to know each other, it is a great time to set some ground rules and emphasize their role in influencing change in the education system. The points above can help to set the tone prior to moving into your first group brainstorm and creating a vision for Mars Startup School.

Step Two. Design.



Now that the students' creativity is flowing, it's time to focus on one component of Mars Startup School. The component that you will be focusing on is Learning Tools and Spaces.

Classrooms are characterized by four walls, desks, blackboards and notebooks. These are the tools and spaces that make up much of the learning experience today.

It is up to your team to design the learning tools and spaces for the Mars Startup School that will enhance the STEM learning experience and prepare students for the future.

Instructions: Design Criteria (40 min.)

Use the **WORKSHEET: OUR DESIGN CRITERIA** to help understand what tools and spaces help you learn and how they can be used at Mars Startup School to enhance STEM learning.

- Read each question on the worksheet aloud.
- Spend 2 minutes on each question and encourage everyone on the team to write as many ideas as possible onto Post-its.
- After writing ideas for each question, have everyone on the team place their Post-its onto the worksheet and cluster similar ideas.

Summarize the key ideas and features at the bottom of the page to define your design criteria. Design criteria may include qualities and characteristics of the tools and spaces that you want at Mars Startup School. You can write directly on the poster!

OUTCOME: Identify the qualities, characteristics and types of learning tools/spaces that can enhance your experience at Mars Startup School.



Design Criteria Worksheet.

Identify the qualities and characteristics of the tools and spaces that you want at Mars Startup School.

Note to facilitator:

The questions and content from each worksheet are listed to the right. Make sure the students answer each of the questions to the best of their ability and encourage creativity. Remind them that Mars Startup School can be whatever they want it to be! If a number of similar ideas emerge, don't panic. This can be extremely helpful in identifying the ideas and themes that the team is most passionate about. Make sure to spend at least 10 minutes to summarize your design criteria and reach a consensus as a team before breaking for lunch.

- What tools help you learn the best?
Consider tools you use in and out of the classroom to learn and what you might include in your backpack, on your computer, phone or in your classroom.
- What environments or spaces spark your curiosity in STEM-related subjects?
Consider experiences in and out of school when you were really engaged in learning and what characteristics or qualities the spaces had that made you excited to learn.
- What technologies do you use to help you learn in and out of the school? *Consider how technology helps you learn and what purpose it will serve at Mars Startup School.*
- What types of environments or spaces help you learn or enhance your learning?
Consider collaborative and individual learning experiences and what spaces help you learn best.
- What 3 tools would you bring with you to Mars Startup School to enhance learning?
Consider the tools you believe are most important to help you learn and why you want to bring them to Mars Startup School.
- How do you interact with your existing tools and spaces? *Consider how you interact with both digital and physical environments and identify the qualities you find most important in both the tools and spaces for learning.*
- Our Design Criteria. *Describe the key elements of the tools and spaces that will enhance your learning at Mars Startup School.*

Step Two Cont'd.

Concept Design.



Now that your team has some clear ideas about the characteristics and qualities of the tools and spaces that can enhance your learning experience, they will need to work out the details of the design and create a concept.

Instructions: Design New Learning Tools & Spaces (60 min.)

Use the **WORKSHEET: DESIGN NEW LEARNING TOOLS/SPACES** to help your team develop the details of the new learning tools and spaces at the Startup School.

- Answer each of the questions on the worksheet in as much detail as possible. Encourage your team to build upon ideas from the previous brainstorm sessions.

Note: You may want to split into two teams to design the learning tools and spaces. You can get back together to discuss after creating a concept for each.

- Write or draw the details of your concept directly onto the poster.

Don't be limited by the questions on the poster. If you feel something else should be included or communicated about your concept - add it!

OUTCOME: Design the tools and spaces that will shape Mars Startup School and enhance your learning experience. Make sure you have the key tools and spaces needed to be successful!



Design Concept Worksheet.

Develop concepts for new learning tools/spaces that will enhance the learning experience at Mars Startup School.

Note to facilitator:

Your team needs to shift from thinking about what the tools and spaces might be to actually designing them. This is where you can draw upon the strengths and interests of the team to produce different aspects of the tools and spaces. Don't hesitate to break into smaller teams if it increases productivity, but make sure to come back together to summarize a unified concept.

- **What is it?** *Define what the new tools/spaces will look and feel like.*
- **How does it work?** *Define what the tools/spaces include and how they will help you learn and achieve your goals.*
- **How do these tools enhance STEM learning?** *Consider who uses the tools/spaces and how they will use them to enhance STEM Learning.*
- **Why will students, teachers and others want to use it?** *Define why the tools/spaces will transform learning.*
- **Where will you use it?** *Define where the tools/spaces exist and how you access the tools.*
- **When will you use it?** *Define when in your academic and personal life you will use the tools/spaces and for how long.*
- **Sketch it!** *Add some sketches of your concept to help communicate how it works, what it looks like and how it might be used.*

Step Three.

Share.



During this step your team will summarize their Challenge and ideas to share with the other teams in Mars Startup School. Each team will only have **5 minutes** to present their final concepts, so be sure the team captures and communicates the most important features of your design!

Instructions: Share (45 min.)

Use the **SHARE WORKSHEET** to summarize ideas. This should only take a few minutes to help your team recap the ideas developed throughout this Challenge. Your team can use all the completed posters to help them present.

- Have the team restate the design Challenge in their own words.
- Summarize the tools and spaces you designed and describe how they meet the design criteria you identified at the bottom of the **WORKSHEET: OUR DESIGN CRITERIA**.
- Describe how the tools and spaces will change the education system on Earth and the impact of the solution on future students.

Gather with the other teams in your Startup School community to share solutions and have a closing discussion about the future of STEM education.

OUTCOME: Summarize the key ideas your team developed throughout this Challenge and communicate your ideas to the other teams.



Share Worksheet.

Summarize your Challenge and ideas to share with the other teams. This should include the most important features of your design!

Note to facilitator:

As the team fills out the final worksheet encourage them to come up with creative ways to present their ideas to the other teams. Encourage your team to take notes of the other teams' ideas.

- Our vision for Mars Startup School is...
Summarize your initial thoughts on Mars Startup School as discussed during Meet Your Team.
- Our design Challenge was...
Restate your design Challenge in your own words.
- Our design criteria...
Summarize key ideas from your design criteria.
- This will be different from the education system on Earth because...
Describe how the tools and spaces you designed will transform the educational experience and how they differ from the traditional system.
- What it looks like and how it works...
Use sketches, day in the life scenarios and words to showcase your final design.

Let's Wrap It up!



Thank you for participating in this Youth Summit and leading your team through the Mars Startup School Challenge. The ideas that they produced throughout the day will help shape the future of STEM education in Canada.

IMPORTANT NOTE: Before you depart please gather the worksheets, Post-its, sketches and notes your team produced over the course of this Challenge. Place everything on the table in order. Make sure no ideas or sketches are lost! Volunteers will be collecting all workbooks and materials at the end of the day.



Next Steps.

Canada2067

The ideas your team produced today will be collected, captured, summarized and presented to policy makers from across Canada to help shape the future of STEM education.

How to Stay Involved.

If you enjoyed taking part in the **Canada 2067** Youth Summit and completing Mars Startup School Challenge you can stay involved in a number of ways:

- Host your own Canada 2067 Startup School workshop by downloading the materials we used today! www.explorecuriosity.org/canada2067
- Host a conversation about STEM learning using the Canada2067 Conversation Guides. Choose from: STEM and Everyday Life; The People We Learn From; and STEM and the Student's Role in Learning. www.canada2067.ca/en/are-you-a-student/#youth-workbooks
- Join us on social media to raise awareness about Canada2067 initiatives. Support us [@Can2067STEM](https://twitter.com/Can2067STEM). Together we can make difference! [#Can2067](https://twitter.com/Can2067)
- Learn more about STEM opportunities through CurioCity career profiles. www.explorecuriosity.org/canada2067



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