



YOUR SKILLS,
YOUR FUTURE.



Electric Vehicles & Careers of the Future

Innovation Creativity & Entrepreneurship (ICE Training)



Be prepared for success, take **TECH.**





YOUR SKILLS,
YOUR FUTURE.

Introductions



Ontario Council for Technology Education

Veronica Kleinsmith & Donna Norrie

Sector Partners:

Centre for Automotive Materials and Corrosion

Dr. Beth McNally





What is ICE?

- Innovation, Creativity and Entrepreneurship is training for SHSM students and the Sector-Partnered Experience graduation requirement for the SHSM red seal
- Focuses on a real challenge from our sector partner – your final submissions from today will be considered for further development!
- OVIN Career Navigator.
- We are so glad you are “here” and we hope you enjoy the experience!
- You can follow along in the Student Handbook - print or digital.





Innovation, Creativity & Entrepreneurship

Creativity is a process of generating ideas, making connections and imagining what could be.



Innovation is the generation and realization of a new idea in the world.

Entrepreneurship is a set of activities for building and scaling an idea sustainably.

The 3 GEARS: A Systematic Approach to Innovation

**Empathy &
Need Finding**



**Ideation &
Prototyping**

Strategy & Testing

The 3 Gears power our ability to be innovative, creative and entrepreneurial!

Need Finding

- There is always a need, even when you are not looking.
- Why is innovation, creativity and entrepreneurship so important?
- [Link: Kids Were Terrified of Getting MRIs. Then One Man Figured Out a Better Way.](#)



From A Challenge



Source: Rotman School of Management

The Better Solution!



Source: Rotman School of Management



One of our Sector Partners:

McMaster University: Centre for Automotive
Materials & Corrosion - Dr. Beth McNally

McMaster SHSM Challenge

Dr. Beth McNally

April 2023

Transportation in the 19th Century

1800's Horse and Buggy



1885 Mercedes



New technology applied to known design

Transportation in the 20th Century

1885 Car



1985 Car



Transportation design changes to fit technological needs

Transportation in the 21st Century

1985 Transportation



2085 transportation



Transportation changes with new technology

Challenge

- New and emerging technologies mean vehicles design will change
- Find a way current vehicles do not fit the mobility needs of your specific SHSM
 - Examples
 - Farmers getting food to market
 - Students to school
 - Elderly to appointments
- Design a vehicle to fit their needs
 - Consider the needs, wants, and economics of the customers and society
- What new technology is required to make this vehicle possible?

Question

How might we design a vehicle to fit the needs of?

- Agriculture
- Arts & Culture
- Aviation / Aerospace
- Business
- Construction
- Energy
- Environment
- Food Processing
- Forestry
- Health and Wellness
- Horticulture and Landscaping
- Hospitality and Tourism
- Information and Communications Technology
- Justice, Community Safety, and Emergency Service
- Manufacturing
- Mining
- Non-profit
- Sports
- Transportation

Gear 1: Empathy & Need Finding

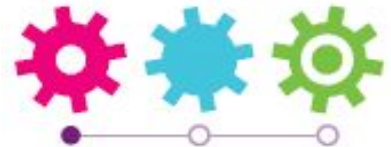
- **Empathy** is the ability to understand the thoughts and feelings of other people, as different from one's own.
- **Empathy** is vital to innovation because understanding that there are needs in the world other than one's own can be life changing

Connected ICE Mindset



I have a responsibility to create new ideas that meet needs in the world.

I can see the value in understanding the world from another person's perspective.



Need Finding...

Need finding is the ability to identify the unmet needs of others, even if they may not be clear to the person who has that need.

“ If I had asked my customers what they wanted, they would have said a faster horse.”



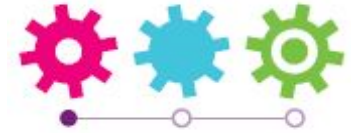
- Henry Ford



Needs are not solutions



Needs Last, Solutions Often Don't



Kodak

“I need to capture memories of my daily life.”





Empathy & Need Finding: Other Challenges



- Return to the SPE website with your student workbook and select 2 other Challenges that you may want to work on.
- For each of these challenges document information in your workbook on **page 4** that is key for building empathy and identifying the needs of the community partners that have shared the challenges.

Empathy & Need Finding	
Potential Challenge 2	Potential Challenge 3
Community Partner:	Community Partner:
Challenge:	Challenge:
Notes:	Notes:



10:00

Selecting A Challenge



- Based on the 3 challenges that you have reviewed you will now select one and work through the remainder of the ICE Process.
- To begin we are going to reword the challenge in a specific format based on the needs that you have identified.



Your Selected Challenge ...

How might we _____



Shifting Gears: Gear 1 to Gear 2

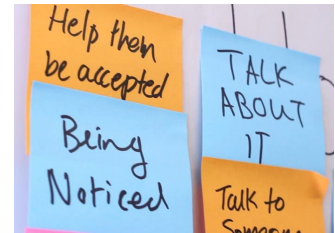


- **Need finding instructions – Part 1**

1. Either individually or in groups, ask yourselves:
 - What does the community partner need?
 - Which of their needs are currently unmet?
2. In your workbook list as many needs as you can possibly think of.

Remember - When Generating the NEEDS:

- No judgment, every idea or need is a good one
- Quantity, leads to quality
- Build on ideas of others and make them better
- Move quickly, keep ideas flowing



Shifting Gears - NEEDS (Cont'd)

4. In your student workbook write this new reworded challenge statement in the middle of the page _____ as shown below.



The image shows a screenshot of a student workbook page. At the top left, there is a purple logo for 'SHSM' with the text 'SCHOOL OF HIGH SKILLS MAINT' above it. To the right of this is another logo for 'THE SKILLS OF FUTURE'. The main title of the page is 'Gear 2: Ideation'. Below the title, there is a paragraph of text: 'Write your "How might we..." question from the previous page into the bubble. Then start generating ideas to meet the need. Every idea is a good idea! Do this part quickly!'. In the center of the page, there is a large, empty rectangular box with a thin green border. Inside this box, there is a purple speech bubble shape. In the bottom right corner of the page, there is a small logo consisting of three overlapping circles in purple, blue, and red, with the letters 'i', 'c', and 'e' positioned around them.



05:00



Shifting Gears ... How might we?

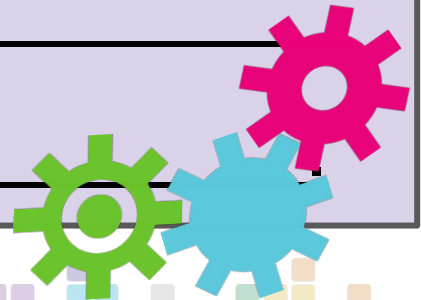
Need finding instructions – Part 2

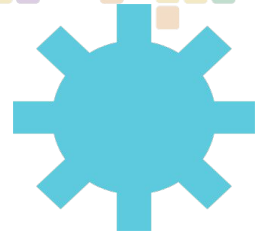
3. In your group or individually select one unmet need that seems interesting or compelling.

You will write a “how might we” question related to this need in this format:

How might we help _____

with their need to _____



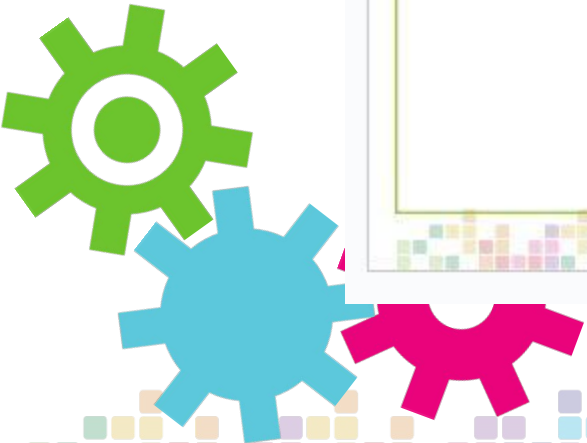


SPECIALT HIGH SKILLS MATCH
SHSM

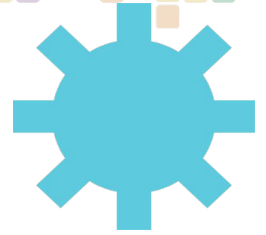
**YOUR SKILLS.
TO FUTURE.**

Gear 2: Solutions Ideation

Write your "How might we..." question from the previous page into the bubble. Then start generating ideas to meet the need. Every idea is a good idea! Do this part quickly!



Gear Two: Ideation & Prototyping



Ideation is the generation of new ideas

A good ideation session generates diverse and divergent ideas. By the end of this activity, you will have generated dozens of ideas relating to your “How might we” question, and cluster them according to relevant themes.

Connected ICE Mindset



I believe that there are multiple possibilities and that I am capable of creating them.

I am willing to take smart risks and learn from them.

I believe I can learn from the ideas and strategies that I build, regardless of their success.



Rules for Ideation - Generating Your Ideas

With your how might we question at the centre of your page - Imagine solutions to the question!



Remember – when Generating your Ideas:

- Defer judgment
- Build on ideas of others
- Go for quantity
- Move quickly!



Tips for Ideation and Generating New Ideas...



Not Great



Better



Ideal

Helpful ideas...

- Are visual – Use images as well as sticky note function
- Are concrete and specific

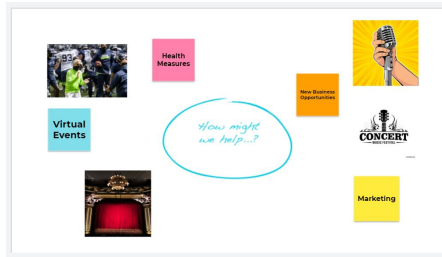


Gear 2 Activity: Ideation



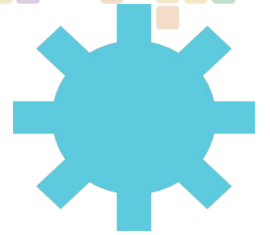
Instructions:

- Preferably on sticky-notes document as many ideas to solve the “How might we” challenge statement that you came up with.
- If you don’t have sticky notes then place your ideas all over the **page 8** of the student workbook.



During this stage the **QUANTITY** of ideas matters more than the **QUALITY!**

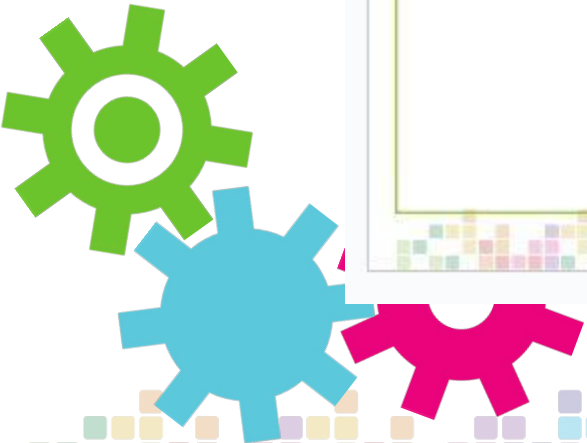




SHSM SPECIALIST HIGH SKILLS MATHEMATICS
YOUR SKILLS. YOUR FUTURE.

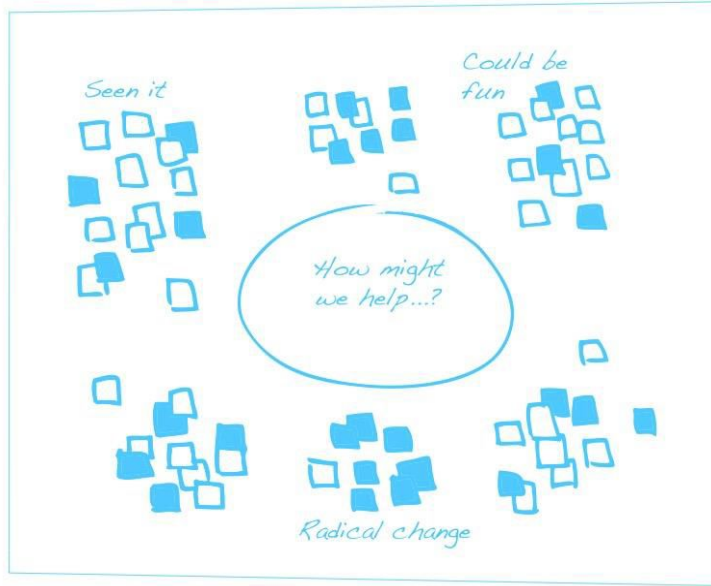
Gear 2: Solutions Ideation

Write your "How might we..." question from the previous page into the bubble. Then start generating ideas to meet the need. Every idea is a good idea! Do this part quickly!



05:00

Gear 2: Clustering Your Ideas



Cluster your ideas into the following categories:

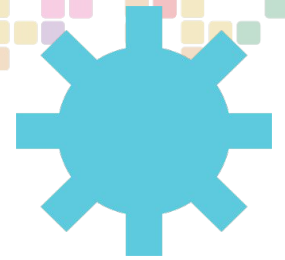
- Seen It
- Could be Fun
- Radical Change



Organize your ideas like this on **page 9** of the student workbook.

05:00

Gear 2: Prototyping



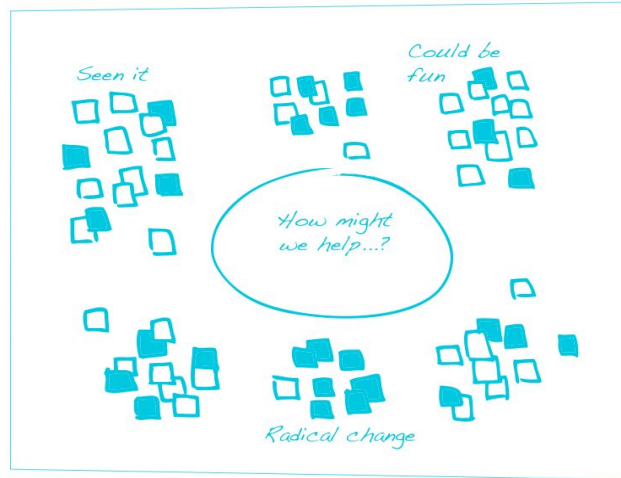
Prototyping is a method for visualizing an idea, for the purpose of gaining feedback and further developing the idea.

From your Ideation (idea generating) session – you are going to move forward with one idea...



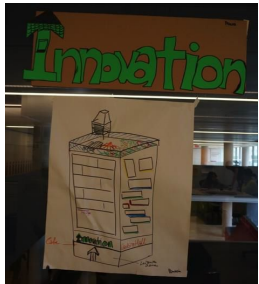
Gear 2: Ideation & Prototyping

- Choose one idea to move forward with and put a star beside that idea

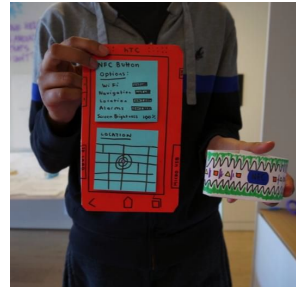
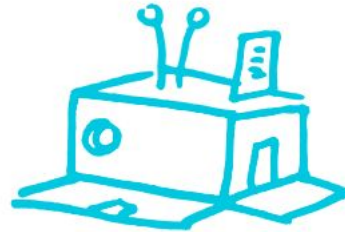


Gear 2: Prototyping helps you share your ideas with others.

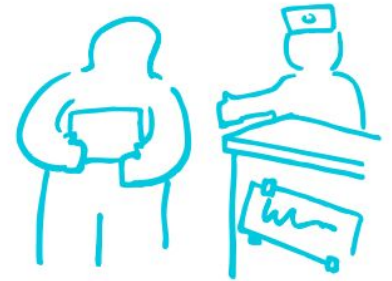
Sketch



Build



RolePlay



Gear 2 Activity: Sketch



- Visualize your idea and draw it on **page 10** of the student workbook
- Make it big and fill the space!
- **DO THIS INDIVIDUALLY!!!**
- What will it look like?
- Don't get caught up on details



05:00

Gear 2 Activity: Mashup

Now you will take your ideas and MASH THEM UP into one idea that will solve the initial “How Might We challenge!”



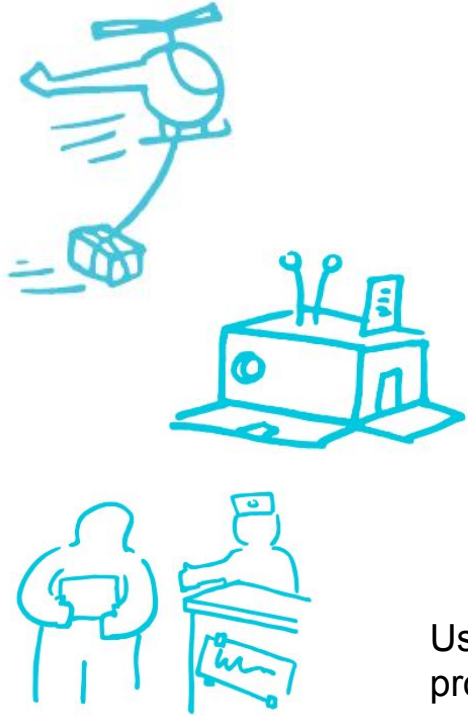
First, you will share your idea sketch with your team.
Spend:


- 1 minute describing your idea
- Listen, asking the following questions for feedback
- What do you like? Why?
- What would you change? Why?
- What questions do you have?
- Make notes as you listen



Document the components of other ideas that you like and think are useful into **page 11** of the student workbook


Activity: Mash up to form New Prototype



  Gear 2: Mash-Up

As others share their ideas document the parts of their ideas that you like the best.

Idea 1	Idea 2	Idea 3	Idea 4



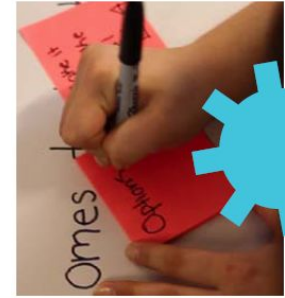
Using features from all of the other ideas create a new prototype on **page 11** of the student workbook





05:00

Gear 2 Activity: Mash Up Debrief



Create new ideas out of all the well-liked features and intentions of the different ideas, mashing the best parts of the ideas into a new idea.





05:00

Shifting Gears - 2 to 3

<p>How Might We Question:</p>	<p>Draw a Picture of your idea:</p>
<p>Describe your idea (In 1-2 Sentences) :</p>	

Either as a team or individually create a new prototype that you will move forward with through the rest of the process (page 12).



03:00



Thank you

- McMaster University
- Ministry of Transportation
- Mountain View Farms
- Rock Tech Lithium Inc.





Gear 3: Strategy & Testing


Strategy is a set of choices made to achieve a desired outcome.

- Developing strategy requires entrepreneurs to consider how the choices they make can lead to a successful outcome for their innovations.

Reflect and Think:

- Does your solution meet the needs of the target market?

Step back:

- Who is your target market?
 - Are you getting to the right people with the right message and medium?
- 

Strategy is About Making Choices to Win

To build a system that will let your idea come to life, there are two fundamental choices:

- Why would a customer choose your product or service over other competitive offerings? Example:



- Who is their customer?
- What is their product or service?
- How do each of these organizations win?



Gear 3: Making Strategic Choices




You've all come up with fantastic ideas, now it's time to make some choices.



Reflect and Think:

- Does your solution meet the needs of the target market?

  Gear 3: Making Strategic Choices


Who is your customer?	What is your product or service?	How will you win?	Does your solution meet the needs of the target market?



  Gear 3: Presenting Your Innovations

Create a 5-minute presentation that answers the following questions (can be a recorded google meet, video, google slides, etc., your choice). Use the template below to help you plan your presentation. Evaluate your plan...add to it if you need to, take away from it if you need to.

What was the need you heard?	What is your idea? Share the single sentence that describes it.	What is the strategy?	What are the impacts and consequences of your idea and strategy on the world around you?





Gear 3: Making Choices as a Team or Individually

- Take time to finalize your idea
- Do you need to make any changes?
- How will you present your idea to the industry partner?
- As a group make necessary changes, go back if you have to.
- Evaluate your plan...add to it if you need to, take away from it if you need to.
- Question what you have done.
- **REFINE YOUR PLAN**, no restrictions! Present your idea however you like...





Gear 3: Presenting Your Innovations

Create a 5-minute presentation that answers the following questions (can be a recorded google meet, video, google slides, etc., your choice) 4.

Presentation Development Template

- What was the need you heard?
- What is your idea? Share the single sentence that describes it.
- What is the strategy?
- What are the impacts and consequences of your idea and strategy on the world around you?





OVIN Career Navigator

- Don't forget to check out the OVIN Career Navigator and pick a one of these segments of the Automotive and Mobility sector:
<https://ovin-navigator.ca/skills-career-pathway/career-pathways/>
- Connected & Autonomous Vehicles (C/AV)
- Auto & Parts Manufacturing (APM)
- Tool, Die & Mold (TDM)
- Aftermarket, Maintenance & Repair (AMR)
- Freight & Goods Movement
- Mobility Planning & Infrastructure

To learn more about a career of interest and what postsecondary options get you there please visit myblueprint!





Presentations and Feedback

- Submit your presentation to your SHSM Lead
- The top 2 from each school will be submitted for review to the industry partner that you chose.

Please also remember to complete the post-survey provided to you by your SHSM Leads.

