EDUCATION FOR INNOVATION

Grades 1-8

A Resource Guide for Teachers

CanadianInnovationSpace.ca

Second Edition

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This resource guide includes text adapted from *Ingenious* by the Right Honourable David Johnston and Tom Jenkins, published by Signal, a Division of Penguin Random House Canada, copyright © 2017, used with permission. It also includes text and illustrations adapted from *Innovation Nation* by the Right Honourable David Johnston and Tom Jenkins and illustrated by Josh Holinaty, published by Tundra Books, an imprint of Penguin Random House Canada Young Readers, copyright © 2017, used with permission.

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Innovation Learning Experiences

Preamble

The Education for Innovation (E4I) resource is intended as an instructional framework mainly for use in elementary schools across Canada. This resource could also be used in homeschooling, camps, enrichment or recreational learning settings. The learning experiences outlined in this document are structured activities following the innovation process and the phases of the Innovation Cycle. The suggested learning experiences are intended to create awareness of Canadian innovations and to inspire learners to create their own innovations. The Innovation Cycle, explained in this resource, was developed to promote an understanding of the phases of innovation and is aligned with approaches such as design thinking, entrepreneurial programs and project-based learning.

Critical thinking, creativity, communication, collaboration, and entrepreneurship are considered 21st century global competencies. The E4I Resources, including the activities related to the Innovation Cycle and the culminating Innovation Project address, and integrate these 21st century learning competencies. The ability of future innovators to apply knowledge and empathy to real-world situations will be enhanced through immersion in E4I learning activities. Educators can encourage deep learning by providing youth with opportunities to transfer their knowledge and skills, lead their own learning and explore innovative solutions to address authentic societal issues.

Educators can plan the innovation experiences to address a range of curriculum and grade-level expectations as applicable. Each learning experience in the E4I resource offers potential goals, resources, teaching strategies and assessments which can be adjusted according to the professional perceptions of educators and the needs or interests of learners.

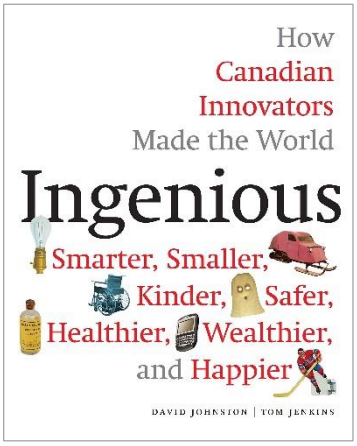
The Innovation Project is a culminating activity and could be presented at an Innovation Celebration which is designed to showcase innovations of Canadian youth. The Innovation Celebration could be held in a classroom, school, community, and can also involve an online component so that innovations are also shared with a virtual audience. Canadian Innovation Week, held annually in the month of May, provides yet another forum for Innovation Celebrations.

Goals of the Resource

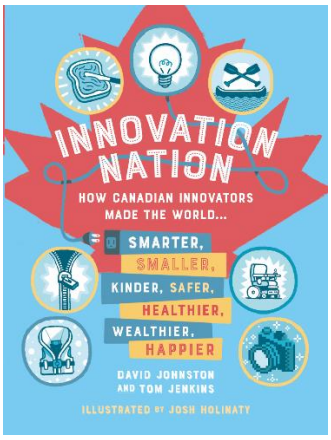
- Promote an understanding and appreciation of the concept of innovation.
- Provide learning experiences for guiding innovative thinking and actions.
- Utilize the stories of Canadian innovators to inspire future innovators.
- Celebrate Canadian innovations and cultivate a culture of innovation.

Background

Canada has a rich history of innovation which is described in the books co-authored by the Right Honourable David Johnston and Tom Jenkins:



Ingenious: How Canadian Innovators made the World Smarter, Smaller, Kinder, Safer, Healthier, Wealthier, and Happier



Innovation Nation: How Canadian Innovators made the World Smarter, Smaller, Kinder, Safer, Healthier, Wealthier, and Happier

The Canadian innovations from the *Ingenious* and *Innovation Nation* books form the basis for the *Education for Innovation (E4I)* resource. They are referenced in the teaching materials and provide the content and context for the study of impactful Canadian innovations. The writing team of the Education for Innovation resources was invited to develop educational materials to accompany the books, *Ingenious* and *Innovation Nation.* Educators may wish to also use a range of other supporting materials as can be found in the references of this document.

The book *Ingenious* includes approximately 300 Canadian innovations that made an impact on the world. It also includes suggestions and strategies for promoting innovation and encouraging future innovators; the charts from *Ingenious* are directly related to the processes and phases described in the Innovation Cycle.

Innovation Nation is for emergent readers, with descriptions of 50 Canadian innovations pulled from the content of *Ingenious.* The intent of these books is to highlight significant innovations throughout Canada's history and to further develop a culture of innovation in Canadian society.

The stories of Canadian innovators and innovations are an excellent catalyst for inspiring youth. Our national website, Canadian Innovation Space, includes stories of past and current innovators, videos, and supporting materials: https://canadianinnovationspace.ca. The website also includes testimonials by educators who have used the Education for Innovation resources in their learning environments. Administrators and educators planning to implement the Education for Innovation resources may wish to review the testimonials and related videos.

Definition of Innovation

Innovation is often described differently in various sources. Generally, it refers to creative thinking and problem-solving. For the purposes of the Education for Innovation (E4I) resource, innovation will be defined as follows:

> *Innovation is the creation or improvement of a product or process to make an impact.*

Innovation Learning Experiences

The Learning Experiences outlined in this resource include a series of intended to follow the phases of innovation: Inquiry, Ideation, Incubation, and Implementation. In each phase, learners will be asked to consider the Impact of innovations. Innovation is a cyclical, repetitive, and iterative process with constant revisiting and revising.

The suggested activities include resources and teaching strategies related to the complex process of innovation. The assessment strategies and tools have been designed to be used at the educator's discretion and adapted as necessary to meet the needs of diverse learners. It should be noted that learning experiences include two sets of templates in the Appendices: some that are appropriate for younger learners (grades 1-6) and others for older learners (grades 4-8).

In order to adapt the learning experiences to align with curriculum expectations in various subject areas, educators may select to focus on a set of Canadian innovations from *Innovation Nation* or *Ingenious* which are aligned to the topic being studied. For example, if an educator is addressing curriculum topics related to energy or environment, the Canadian innovations selected for the Inquiry experience could include the light bulb, blue box recycling, and weather strip. Another example of a unit of study might be related to transportation and could include examples such as the dump truck, the canoe, the air ambulance, the snowmobile, and the toboggan. The stories from *Innovation Nation* and *Ingenious* will serve as the inspiration for learning about the challenges and successes of Canadian innovators. Through the activities provided, educators can promote a greater understanding of innovation and encourage learners to develop their own ideas for culminating Innovation Projects. Learners will be motivated as they inquire, plan, create, test, improve, and implement innovations that they believe will make a positive impact on the world. The issue of positive impact or 'Innovation for Good' is addressed throughout the Innovation Cycle and is especially explored in the learning experiences related to developing and incubating an innovation.

The learning experiences in the Education for Innovation (E4I) resource were designed and modelled on the processes used by innovators and project teams across a range of sectors and disciplines.

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Learning Experiences Overview

	Synopsis	Learning Strategies	Assessment Strategies & Tools	Appendices
1. What is Innovation?	Learners will demonstrate an understanding of the concept of innovation by developing a working definition.	Small Group Activity Word Sort Graphic Organizer Metacognitive Reflection	**Strategy**: Graphic Organizer Exit Ticket **Tool**: Rating Scale	• Canadian Innovations (Appendix 1A) • Innovation vs. Invention Graphic Organizer (Appendix 1B) • Exit Ticket (Appendix 1C) • What is Innovation? Rating Scale (Appendix 1D)
2. What are the Impacts of Innovations?	Learners will explore the impact of Canadian innovations in preparation for determining the impact of their own innovation.	Small Group Discussion Numbered Heads Collaborative Activity Metacognition Reflection Graphic Organizer	**Strategy**: Placemat Group Activity Impact of Innovations Activity Sheet Exit Ticket **Tool**: Rating Scale	• *Innovation Nation* Chapter Chart (Appendix 2A) • *Ingenious* Chapter Chart (Appendix 2B) • *Ingenious* Innovations Chart organized by Themes (Appendix 2C) • Placemat Group Activity (Appendix 2D) • Impact of Innovations (Appendix 2E) • Exit Ticket (Appendix 2F) • What is the Impact of Innovation? Assessment (Appendix 2G)
3. What is an Innovation Space?	Learners will develop and explore the Innovation Space. They will also inquire about past and present Canadian innovations.	Self-Guided Inquiry Internet Technologies Graphic Organizer	**Strategy**: Innovation Exploration Activity Sheet **Tool**: Rating Scale	• QR Code Activity Example (Appendix 3A) • Innovation Exploration (Appendix 3B) • Innovation Exploration (Appendix 3C) (Appendix 3D)

	Synopsis	Learning Strategies	Assessment Strategies & Tools	Appendices
4. What are the Qualities of Innovators?	Learners will identify and recognize the qualities of innovators by examining examples of Canadian innovators.	Word Wall Learning Centres Metacognition Reflection Oral Presentation Graphic Organizer	**Strategy:** Expert Groups Innovator Exploration Activity Sheet **Tool:** Self-Evaluation of Innovator Qualities Rating Scale	• Innovator Exploration (Appendix 4A) (Appendix 4B) • Evaluating Your Own Innovator Qualities (Appendix 4C) (Appendix 4D) • Who is an Innovator? Rating Scale (Appendix 4E)
5. What is an Innovation Cycle?	Learners will examine the phases of the Innovation Cycle as well as the various aspects and questions within each phase.	Four Corners Activity Group Discussion Self-Correcting Activity	**Strategy:** Four Corners Activity Innovation Cycle Aspect Strips **Tool:** Observation Chart	• How can YOU be an Innovator? (Appendix 5A) • Phases and Aspects of the Innovation Cycle (Appendix 5B) • *Innovation Nation* Graphic of Innovation Cycle (Appendix 5C) • Graphic of Innovation Cycle (Appendix 5D) • Graphic of Innovation Cycle with aspects (Appendix 5E) • Innovation Cycle Aspects Strips (Appendix 5F) • Observation Chart (Appendix 5G)
6. What is an Innovation Project?	Learners will become familiar with the expectations of their Innovation Projects and discuss project possibilities.	Group Discussion Brainstorming Graphic Organizer	**Strategy:** Innovation Brainstorming Activity Sheet Innovation Project Outline **Tool:** Anecdotal Notes Innovation Project Rubric	• Innovation Project Outline (Appendix 6A) (Appendix 6B) • Innovation Project Sheet (Appendix 6C) (Appendix 6D) • Innovation Brainstorming Assessment (Appendix 6E)

	Synopsis	Learning Strategies	Assessment Strategies & Tools	Appendices
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8. How is an Innovation Tested and Improved?	Learners will develop a plan to test the effectiveness and impact of their innovation and create a plan to address any challenges.	Scientific Method Interviews Metacognition Reflection	**Strategy**: Testing Interview and Survey Activity Sheets Exit Ticket **Tool**: Rating Scale Innovation for Good Declaration	• Sample of Innovation Testing - *Innovation: Child-proof Match Container* (Appendix 8A) • Innovation Testing Template (Appendix 8B) (Appendix 8C) • Sample Interview Template (Appendix 8D) (Appendix 8E) • Sample Survey Template (Appendix 8F) (Appendix 8G) • Exit Ticket (Appendix 8H) • Rating Scale/ Assessment (Appendix 8I)
9. How is an Innovation Implemented?	Learners will develop an Implementation Plan for the project including a budget, marketing, distribution, and communication.	Group Discussions Planning Roles for Group Members	**Strategy**: Implementation Plan Activity Sheets Innovation Presentation Activity Sheets **Tool**: Innovation Presentation Checklist Innovation Project Rubric	• Innovation Implementation Plan (Appendix 9A) • Innovation Presentation Checklist (Appendix 9B) (Appendix 9C) • Innovation Implementation Plan Self Checklist (Appendix 9D) • Innovation Implementation Plan Peer Checklist (Appendix 9E)
10. What is an Innovation Celebration?	Learners will plan, host and participate in an Innovation Celebration, sharing their innovations.	Oral Presentation Media/Visual Presentation	**Strategy**: Innovation Celebration Presentation **Tool**: Innovation Project Rubric	• Task List (Appendix 10A) • Sample Invitation (Appendix 10B)

Learning Experience 1

What is Innovation?

Background

Innovation is a word that is often used in our society, yet it may not be well understood. Innovation may refer to ideas and improvements in areas such as science, business, and technology, but it also pertains to areas such as the arts, health care, sports, entertainment, education, food, social services, and governance.

Almost any object or idea that humans have created is the result of innovators asking simple questions, such as: What would happen if …? How can we …? What if we try …? How can we make this better? There are many variations on the definition of innovation. For the purpose of the Education for Innovation resource, the following definition will be used:

Innovation is the creation or improvement of a product or process to make an impact.

For younger children, the following is a simplified definition:

Innovating is creating or improving a thing or action to make a difference.

Educators may post the definition of innovation for reference by learners. It is also important to clarify the difference between an invention and an innovation. Invention is the creation of a new product (thing) which may or may not have been implemented to make an impact. An innovation can refer to the creation of a new product (thing), but it is also the improvement of a product or process to make a positive impact. An invention is usually new, science-based and may not have necessarily been implemented to make an impact. An innovation is the creation or improvement of a product, or process, which has been implemented to make a positive impact. Democracy is an example of a social innovation that has changed continually over time. Artists develop new innovative processes and products with strong impacts on our world. Innovation rarely happens only once. Instead, it is a continuous process.

The activity that follows is designed to introduce the definition and process of innovation. It can be cross-curricular, addressing a number of different subjects. This activity can be adapted to meet the needs and interests of learners. Educators can use this activity to begin a unit of study in curriculum such as Science, Social Studies, Health/Physical Education, and Arts. It can also include Mathematics and Language expectations, as grade appropriate.

Learning Goals

- Understand the concept of innovation and recognize its impact on our lives.
- Determine a definition of innovation.
- Develop skills of inquiry, initiative, collaboration, and problem-solving.
- Explore some Canadian innovations and their impacts.

Resources

- *Ingenious* and *Innovation Nation* by David Johnston and Tom Jenkins
- Light bulbs: LED and incandescent
- Older style phone (such as rotary) and recent cell phone
- Whiteboard or Chart Paper and Post-It Notes
- Video: Canada: A Nation of Innovators: https://goo.gl/R3aTcU
- Video: Governor General Innovation Awards: www.canadianinnovationspace.ca
- Artifacts or images representing Canadian innovations (Appendix 1A)
- Innovation vs. Invention Graphic Organizer (Appendix 1B)
- Exit Ticket (Appendix 1C)
- 'What is Innovation' Assessment (Appendix 1D)

Activating

- Display the word Innovation on a whiteboard, chart paper or other surface. Under the word Innovation, write the words: Examples, Descriptors and Definition.
- Ask learners if they have heard or seen the word innovation at home, school or in the community.
- Show learners the incandescent bulb and the newer LED light bulb. Inform learners that the light bulb is actually a Canadian innovation created by Henry Woodward and Mathew Evans, but Thomas Edison received the patent. Ask learners why the light bulb is important to our world and how the LED version is an improvement.
- Show an older phone (invented by Alexander Graham Bell) and the cell/smart phone as examples of innovations.

Acquiring and Applying

- Ask learners to identify examples of objects or ideas in their world that might be the result of an innovation. Learners can record their suggestions on Post-It Notes to add to the Examples part of the Innovation board.
- Ask learners to begin to share their understanding of what innovation means with the class. There are likely to be several suggestions such as "good ideas" or "new things".
- Project or show the chart form Appendix 1A, to show some Canadian innovations.
- Discuss each innovation and use the discussion to check learners' understandings of the concept of innovation. After naming each item, challenge learners to identify why it is an innovation. Ask whether the innovation is a product (thing) or process (action).
- Discuss how the terms innovation and invention are different. Use a Graphic Organizer (Appendix 1B) and selected images (Appendix 1A) to sort inventions and innovations. The intersection of the circles could represent how an innovation can also be an invention. Invention is the creation of a new item. Innovation may include the creation of a new item, but it can also be the creation or improvement of a product or process. Most inventions are innovations, but not all inventions are an innovation since innovations can be processes and they must also have made an impact. This activity can be done in small groups using the provided template or completed on an interactive white board.
- Show the video Canada: A Nation of Innovators and ask learners to identify some Canadian innovations.

- Ask learners to review the various innovations featured in the video and make list of innovations as class to be included on the Innovation board. After watching the video, learners may be able to recall specific words used as Descriptors of innovation. These terms such as risk-taking, problem-solving and impact may be generated as Descriptors of innovation.

Consolidation and Conclusion

- Create a class definition of Innovation using the following to guide the discussion: Innovation is the creation or improvement of a product (thing) or process (action) to make a positive impact (difference).
- Write the definition under the word Innovation and post it on an Innovation Bulletin Board or in the Innovation Space (see Learning Experience 3). The Innovation Board could also be electronic through a Learning Management System or Google Docs.

Assessment

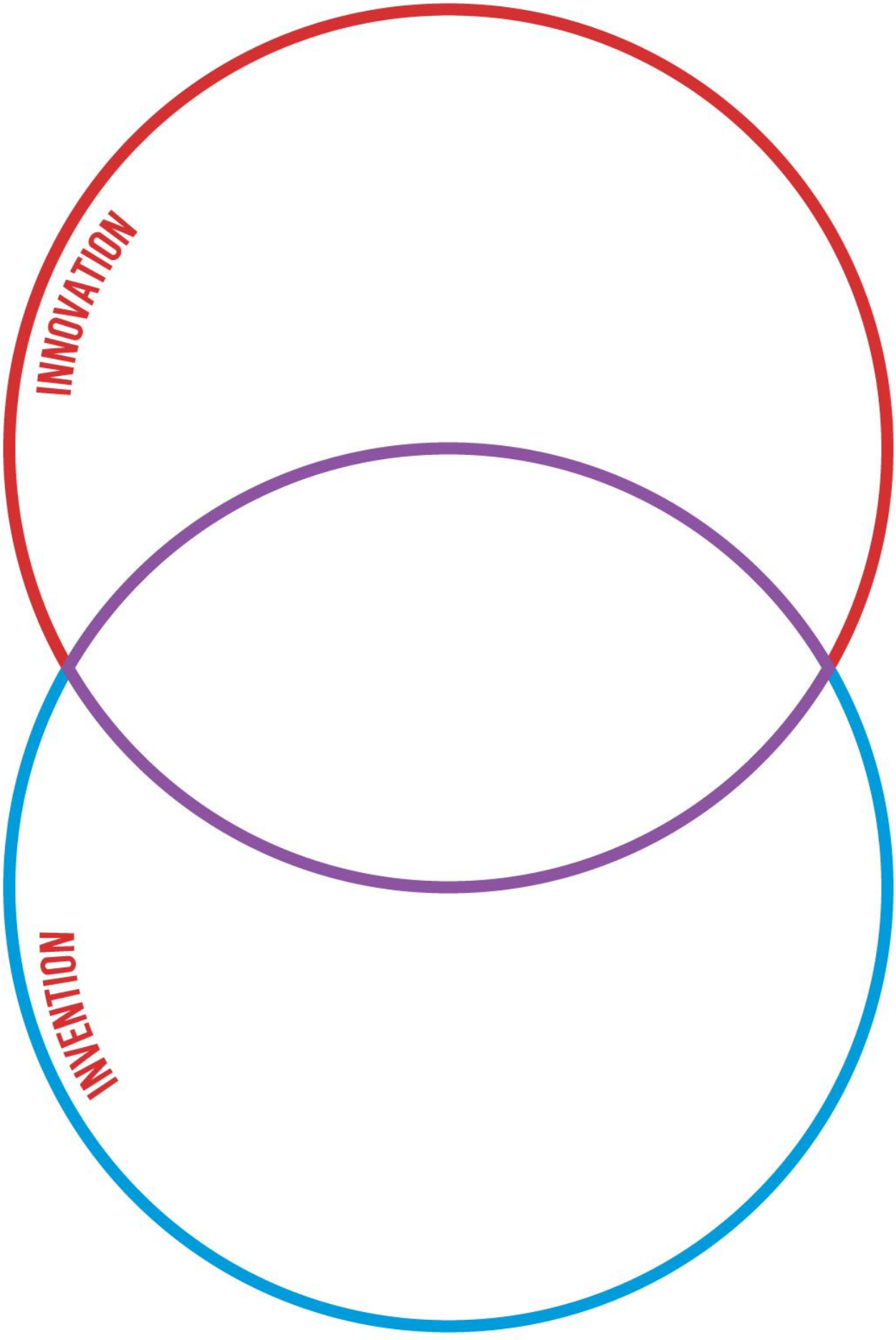
Strategy: Graphic Organizer (1B) and Exit Ticket (1C)
Tool: Rating Scale (1D)

In addition to whole group discussion, an exit ticket can be used to assess each learner's comprehension of innovation (Appendix 1C). An assessment tool has been provided and can be accommodated to include the discussion and/or exit ticket (Appendix 1D).

Canadian Innovations

What Existed Before	Canadian Innovation
Button 	Zipper 
Peanuts 	Peanut Butter 
Dollar Bill 	Loonie 
Peach Basket 	Basketball 
Jacket 	Life Jacket 

What Existed Before	Canadian Innovation
Telephone 	BlackBerry 
Cardboard Box 	Egg Carton 
Truck 	Dump Truck 
Mask 	Goalie Mask 
Screen 	Multi-Touch Screen 


INNOVATION
INVENTION

Grades 1-6

Name: _____

What is Innovation?

Draw a picture of an innovation. Write some key words around your drawing to share what you have learned.

Grades 4-8

Name: _____

What is Innovation?

Choose one innovation. Use your knowledge of the word "innovation" to explain why your selected product, action or process represents an innovation.

'What is Innovation?' Assessment

Check for understanding. How does the learner:

- Identify various innovations;
- Recognize differences between innovations and inventions;
- Communicate information about innovation.

Student Name	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent

Notes:

Learning Experience 2

What are the Impacts of Innovations?

Background

An important aspect of innovation is Impact which implies the difference an innovation makes on the world. Examples of positive impacts of innovations include better efficiency, safety, empathy, health, communications, entertainment, economy, profits, or governance.

For example, innovation may result in the following differences/impacts:

- A product is more efficient, compact, interesting, aesthetically pleasing, safer or less fragile.
- A process is easier to understand, more accessible, safer, more environmentally responsible, more diverse, or more effective.

Learners will benefit from reflecting on the impact of past innovations and begin to determine the impact they wish to make with a new innovation. The desired impact of a new innovation will affect the design and is important to continually assess throughout the Innovation Cycle. In this activity, educators can encourage learners to also discuss potential negative impacts of innovations. Learners may be interested in reflecting on the six principles of the Innovation for Good document provided at the end of this resource. These principles were developed to guide innovators to make ethical decisions and positive impacts. The development of social and emotional skills, attitudes and values of future innovators is important to enhance the ability to discern ethical impacts. A sense of responsibility will enable youth to harness the full potential of new innovations and shape the world to be a better place.

Learning Goals:

- Apply the understanding of different kinds of impact for innovations.
- Develop skills of inquiry, initiative, collaboration, and problem-solving.
- Discover and discuss Canadian innovations and their impacts.
- Explore potential impacts for their future innovation projects.

Resources

- *Ingenious* and *Innovation Nation* by David Johnston and Tom Jenkins
- 4-6 Canadian innovation artifacts or images
- This sample activity requires: Peanut Butter (empty jar or photo), Life Jacket, Touch Screen and Zipper.
- *Ingenious* Videos on Peanut Butter, Life Jacket, Touch Screen and Zipper. These videos can be found at www.canadianinnovationspace.ca
    - Peanut Butter: https://canadianinnovationspace.ca/peanut-butter/
    - Life jacket: https://canadianinnovationspace.ca/life-jacket/
    - Multi-Touch Screen: https://canadianinnovationspace.ca/multi-touch-screens/
    - Zipper: https://canadianinnovationspace.ca/zipper/
- *Innovation Nation* Chapter Chart (Appendix 2A)
- Sample *Ingenious* Chapter Chart (Appendix 2B)

- Sample Chart of *Ingenious* Innovations by Topic/Theme (Appendix 2C)
- Placemats for Group Activity (Appendix 2D)
- Impact of Innovations (Appendix 2E)
- Exit Ticket (Appendix 2F)
- What is the Impact of Innovation?' Assessment (Appendix 2G)

Activating

- Introduce and watch a selection of the videos about Canadian Innovations: Peanut Butter, Life Jacket, Touch Screen and Zipper
- Ask learners to consider the changes or differences that innovations have made on the world.

Acquiring and Applying

- Set up Innovation Stations around the classroom/learning environment. Each station should have either an artifact or an image of the selected innovation and a Placemat Activity (Appendix 2D). Resources like *Ingenious*/*Innovation Nation* or other sources of information about each innovation should be accessible. Note: The selected innovations can relate to the topics being studied in social studies, science, arts, physical education, etc. Examples of innovation topics/themes are listed in Appendix 2A. Or the innovations selected can be chosen according to the chapters of the *Innovation Nation* book (Appendix 2B) or the *Ingenious* book (Appendix 2C). Alternatively, educators may wish to address more current Canadian innovations related to a particular subject or topic.
- Organize learners into groups according to the number of innovations being explored. (For example, in a class of 25 learners, there could be 5 groups examining 5 innovations.) The groups will rotate from station to station, completing the Placemat Activity for each innovation.
- Ask learners to examine the artifacts or images provided at each station and use the provided resources to answer the placemat questions. (For primary learners, it might be helpful to have a parent volunteer or older learning buddy at each station).
- Explain that learners will examine the innovation at their station, discuss, and record their responses to the five questions.
- After the groups are finished at their first station (about 10 minutes), ask learners to rotate to the next station and examine the innovation. Have learners read the answers provided by the previous group, and add new answers or improve upon the answers already presented.
- Continue to rotate the groups until the learners have examined the innovations at all the stations. As they move through succeeding stations, learners may find it increasingly difficult to add or improve upon the answers already provided. If so, encourage learners to generate alternative answers, improvements, and new concepts.

Consolidation and Conclusion

- Ask groups to return to their starting stations and retrieve their original placemat. In succession, each group can present the information on their placemat to the class.
- Invite learners to vote on the innovation they think had the greatest impact. This can stimulate a discussion on defining impact and possible negative impacts. As a voting system, each learner could

be given a Post-It Note to record the innovation they believe had the greatest impact, creating a bar graph on the board. An electronic voting system could also be used.

- Provide learners with the Impact of Innovations table (Appendix 2E) to be completed in class or at home as a follow-up activity.

Assessment

Strategy: Placemat Group Activity (2D), Impact of Innovations Activity Sheet (2E) Exit Ticket (2F)
Tool: Rating Scale (2G)

In addition to the small group activity, the rating scale (2G) and exit ticket (Appendix 2F) can be used to assess the learner's comprehension of innovation.

"Innovation Nation" Chapter Chart

Chapter	Innovation							
Smarter	Duck Decoy	Light Bulb	Electric Radio	Dump Truck	Snow Science	BlackBerry		
Smaller	Canoe	Toboggan	Telephone	Snowmobile	Walkie-Talkie	Canadarm	Java	
Kinder	Longhouse	Forensic Pathology	Declaration of Human Rights	Garbage Bag	Electric Wheelchair	Blue Box Recycling	Right to Play	
Safer	Igloo	Life Jacket	Foghorn	Robertson Screw	Gas mask	Shrouded Tuyere	Goalie Mask	
Healthier	Peanut Butter	Buckley's Mixture	Insulin	Atlas of the Heart	Prosthetic Hand	Sulcabrush	Telesurgery	
Wealthier	Canada Dry	Crispy Crunch & Coffee Crisp	Whoopee Cushion	Shreddies	Instant Replay	Digital Photography	IMAX	
Happier	Maple Syrup	Lacrosse	McIntosh Apple	Basketball	Zipper	Superman	World's First Search Engine	Cirque du Soleil

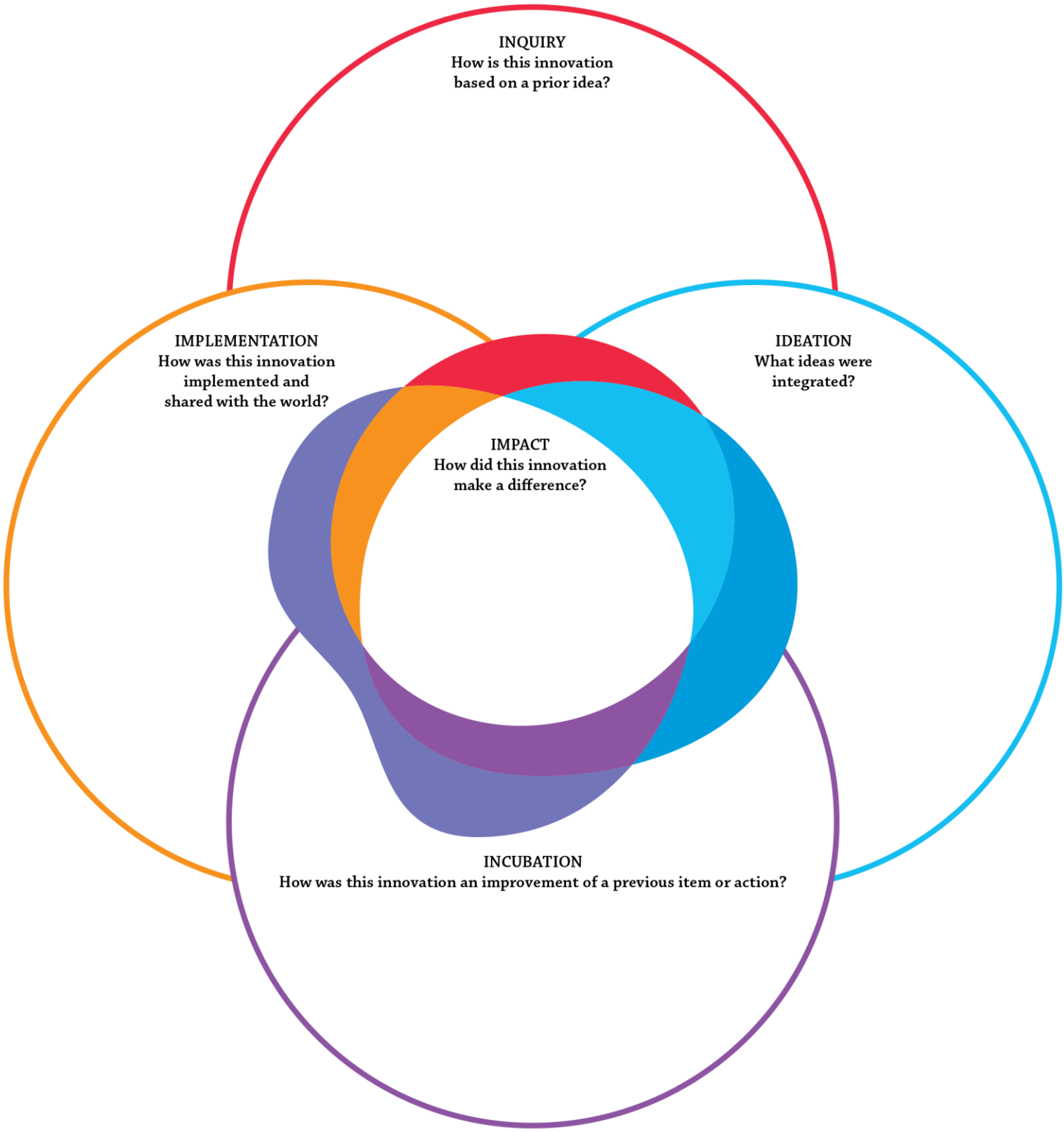
Sample "Ingenious" Chapter Chart

Chapter	Innovation					
Smarter	Duck Decoy	Light Bulb	Liquid Helium	Caulking Gun	Electric Radio	Megaphone
Smaller	Canoe	Walkie-Talkie	Telephone	Ship's Propeller	Ski-Doo	Steam Buddy
Kinder	Garbage Bag	Declaration of Human Rights	Right to Play	Electric Wheelchair	Blue Box Recycling	Fish Ladder
Safer	Lifejacket	Kerosene	Gas Mask	Hot and Cold Faucet	Spiral Nail	Snow Goggles
Healthier	Insulin	Pablum	Microsurgical Staple Gun	Pacemaker	Canola Oil	Prosthetic Hand
Wealthier	Alkaline Battery	Digital Photography	IMAX	Plexiglas	Oil Drilling	Scarborough Suitcase
Happier	Egg Carton	Basketball	Lacrosse	Ironing Board	Wringer Washer	Waterproof Shoes

Sample Chart of "Ingenious" Innovations Organized by Topic/Theme

Topic/Theme	Innovation					
Sports	Goalie Mask	Hockey	Basketball	Lacrosse	Snow Mobile	Snow Shoes
Agriculture	Marquis Wheat	End of Grain Rust	Self-Propelled Combine Harvester	Experimental Farm	Canola	McIntosh Apple
Arts	Group of Seven	National Film Board	Flag Colour Standards	Multi-Dynamic Image	Cirque de Soleil	Tutti-Frutti Modelling Dough
Science	Plate Tectonics	Neutrino Mass	Electron Transfer Theory	Atomic Recoil	Liquid Helium	Neutron Scattering
Communications	Walkie-Talkie	Two-way Messaging	Megaphone	Digital Telephone Switch	Telephone	BlackBerry
Technology	Electric Oven	56K Modem 1993	Computerized Braille	Electric Wheelchair	Multi-touch Screen	Avro
Education	ACTAR 911	Media Studies	Documentary Film	National Research Council of Canada	Right to Play	Breakfast for Learning
Health	Meningitis Vaccine	Blood Transfusion Service	Prosthetic Hand	Wound Diagnosis	HIV Cocktail	Insulin
Business	BlackBerry	Me to We	Commercial	Interest Calculator	Wonder Bra	Dinner Theatre
Indigenous	Canoe	Life Jacket	SakKijânginnatuk Nunalik	Moccasins	Truth with Reconciliation	Snowshoe
Transportation	Toboggan	Ship's Propeller	Snowmobile 1937	Ski-Doo	Steam Buggy	Air Ambulance
Entertainment	Movie Theatre	Whoopee Cushion	Superstardom	Saturday Night Live	Trivial Pursuit	IMAX

Name: _____ **Innovation:** _____



Impact of Innovations

Name: Date:

Innovation is the creation or improvement of a product (thing) or process (action) to make a positive impact (difference). Use the chart below to organize your research on past Canadian innovations and their impact.

What Is the Innovation?	What Is the Impact of the Innovation?
Life Jacket	Water safety: Originally, the life jacket was innovated by Inuit whale fishers to protect them from the cold. It was further innovated to keep them from drowning.

EXIT TICKET

Name: _____

Three facts I learned:

1. _____

2. _____

3. _____

Two questions I have:

1. _____

2. _____

One opinion I now have:

1. _____

What is the Impact of Innovation?

Check for understanding. How well does the learner:

- Apply the concept of different kinds of impact for innovations;
- Discover and discuss Canadian innovations and their impact;
- Explore potential impacts for their future innovation projects.

Student Name	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent

Notes:

Learning Experience 3

What is an Innovation Space?

Background

To help learners understand the process of innovation, it is important to provide resources and opportunities that reflect an innovative culture. An Innovation Space is a designated area in a classroom, school, or other setting that provides learners with a temporary or permanent location to examine, develop, plan, make, create, test, and improve innovations on an ongoing basis. An Innovation Space is also a place to display Canadian innovations, and learner-created Innovation Projects at various stages of completion. Learners can contribute to the Innovation Space by adding additional artifacts from home or examples from media resources. The Innovation Space can also be a hub for researching innovations and their stories. Some schools have a Makerspace, including art and building materials which could be expanded to include an Innovation Space, broadening the capacity and scope of the interactive center to include the development of social innovations. Educators may consider establishing a virtual Innovation Space in a learning management system to encourage collaboratively collecting content and stimulating discussions related to innovation.

Learning Goals

- Collaboratively design and develop an Innovation Space.
- Apply and extend acquired knowledge of the Innovation Cycle and processes to the Innovation Space.
- Demonstrate collaboration through researching and innovating with peers.
- Identify and research Canadian innovations related to areas of curriculum.
- Use materials in the Innovation Space to create, test and implement innovations.

Resources

- Artifacts or images of Canadian innovations
- Example artifacts or images: telephone, pager, walkie-talkie, BlackBerry, etc.
- QR Code Activity Examples (Appendix 3A)
- Grades 1-6: Innovation Exploration (Appendix 3B)
- Grades 4-8: Innovation Exploration (Appendix 3C)
- Educator Rating Scale (Appendix 3D)
- Technology device(s) with access to the Internet and a QR Code Scanner (these apps are available for free in the App Store or in Google Play).
- Quick Response (QR) Code activities that link learners to information about particular innovations (note: these codes should be selected to reflect the topic of study).
- Virtual Reality Viewers to experience 3D views of the innovations e.g. Canadian Structures.
- Art and building supplies (See Glossary for full list).
- Printer, 3D printers, tablets, etc.

Activating

- Set aside a physical location (or virtual platform) for an Innovation Space. Place different artifacts, images, and QR code activities in the space. These resources should reflect Canadian innovations that are relevant to the topic of study. For example, if learners are focusing on innovations in communication, educators may want to include artifacts, images, or activities that reflect innovations such as the telephone, pager, walkie-talkie, BlackBerry, etc.
- Introduce learners to the concept of an Innovation Space and invite them to collaboratively contribute to its development.
- Decide how learners should be able to access the Innovation Space; ideally, it should be available daily.

Acquiring and Applying

- Encourage learners to explore different innovations using related materials, activities and research platforms.
- Ensure that each learner has sufficient time to explore the space and its various resources.
- Provide a range of activity cards with information or research questions about innovations. If desired, add QR codes that include information about the Innovations. These cards can direct learners to online resources pertaining to different Canadian innovations. See Appendix 3A for sample innovations in Communications activities. If technology access is limited, labeled artifacts and images can be provided.
- Guide learner inquiry with Innovation Exploration research sheets (See Appendix 3B or 3C). These templates will ensure that the learners are researching Canadian innovations and experiencing the inquiry phase of the Innovation Cycle.
- Encourage learners to contribute artifacts or images to the Innovation Space based on their inquiry. Educators can also encourage learners to contribute media articles about innovation.
- Engage with learners by spending time at the Innovation Space to help guide discussions. This will be an important contributor to learning assessment and success.

Consolidation and Conclusion

- Stimulate discussions by facilitating small group inquiries after periods of exploration and creation at the Innovation Space.
- Consolidate learning by converting completed Innovation Exploration sheets into an electronic file or class booklet. This collection can be reviewed and enjoyed by learners in their reading center.
- Encourage learners to contribute artifacts or photos of Canadian innovations from their community.

Assessment

Strategy: Innovation Exploration Activity Sheet (3B, 3C)
Tool: Rating Scale (3D)

The Innovation Exploration sheet can be used as an exit ticket for the activity providing educators with an opportunity to assess understanding of the Inquiry phase. Educators can use a rating scale to determine engagement and inquiry (Appendix 3D).

BLACKBERRY BOLD 9900 COMMERCIAL

THE CANADIAN ENCYCLOPEDIA: MIKE LAZARIDIS

THE CANADIAN ENCYCLOPEDIA: BLACKBERRY

BLACKBERRY BOLD 9780 COMMERCIAL

BLACKBERRY

THE BBC: ALEXANDER GRAHAM BELL

THE BELL HOMESTEAD

BELL MOBILITY TV COMMERCIAL: FAST LIVES HERE

CANADIAN ENCYCLOPEDIA: ALEXANDER GRAHAM BELL

INNOVATION 150: THE TELEPHONE

THE LA TIMES: THE PAGER

INNOVATION 150: THE BLACKBERRY PAGER

SATELLITE PAGING COMMERCIAL 1980S

HOW PAGERS ARE USED TODAY

MOTOROLA PAGER COMMERCIAL 1995

DONALD L. HINGS: WALKIE TALKIE

THE WALKIE TALKIE TODAY

INNOVATION 150: WALKIE TALKIE

Innovation Exploration

Innovation Name:

1. Draw a picture of the innovation:

2. How was the innovation created?

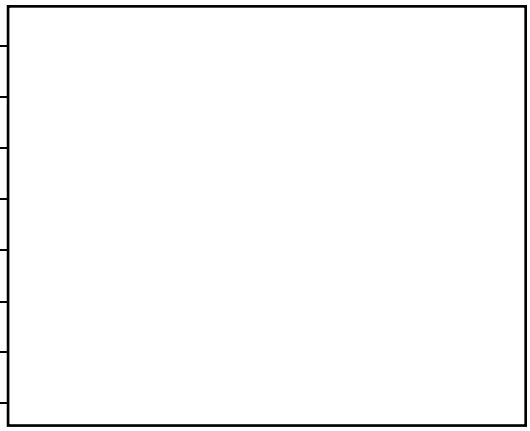
3. What is the impact of the innovation?

4. Where do you see this innovation in your life or community?

Innovation Exploration

Innovation Name:

Provide background information on your selected innovation. Use the square to draw a picture of the innovation.



1. What is the purpose of the innovation?

2. What product or process did the innovation strive to improve?

3. What is the impact of the innovation?

4. Where can you find this innovation in your daily life, community or in the world?

5. Has the innovation improved since its original creation?

Innovation Exploration Assessment

Check for understanding. How does the learner:

- Demonstrate collaboration and engagement with the Innovation Space;
- Provide evidence of researching Canadian innovations;
- Communicate learning with clarity and comprehension.

Student Name	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent

Notes:

Learning Experience 4

What are the Qualities of Innovators?

Background

Canada is a nation with innovators in every field including the arts, government, science, technology, business, health, sports, and social organizations. It is helpful to discuss the qualities of innovators with learners, such as persistence, collaboration, problem solving, initiative, caring, resilience, and strong work ethic through real-life examples of Canadian innovators. Learners are invited to examine and research Canadian innovators and their biographies to learn more about innovator qualities. In this activity, learners will form expert groups on Canadian innovators, to then impart information with new sharing groups. Learners will be given the opportunity to assess their own characteristics and determine their qualities over time.

Learning Goals

- Understand and examine the qualities of innovators (i.e., persistence, creativity, collaboration, resourcefulness).
- Research and explore these qualities through biographies of Canadian innovators.
- Self-reflect on personal innovator qualities.

Resources

- *Ingenious* and *Innovation Nation* by David Johnston and Tom Jenkins
- Canadian Encyclopedia Website: https://goo.gl/h6XmnK
- Heritage Minute Videos: https://goo.gl/teWvDx
- Dictionary of Canadian Biography Website: https://goo.gl/kZbrxD
- Governor General Innovation Awards: https://innovation.gg.ca/en/
- Technology device(s) with access to the Internet
- Grades 1-6: Innovator Exploration template (Appendix 4A)
- Grades 4-8: Innovator Exploration template (Appendix 4B)
- Grades 1-6: Evaluating Your Own Innovator Qualities (Appendix 4C)
- Grades 4-8: Evaluating Your Own Innovator Qualities (Appendix 4D)
- Who is an Innovator? Rating Scale (Appendix 4E)

Activating

- Create a brainstorming web with learners about the qualities of an innovator. Learners may respond with terms such as hard-working, creative, problem-solver, risk-taker, collaborative, etc.
- Discuss characteristics that help people think and act innovatively.
- Use the Heritage Minutes website to provide learners with stories of Canadian innovators.
- Grade 1-4: Use an example video such as a Heritage Minute about basketball: https://goo.gl/SJo2rE
- Grade 5-8: Activate thinking and make inferences about innovator qualities by viewing the Heritage Minute about Jacques Plante who developed the goalie mask: https://goo.gl/sa2oQg

- Continue contributing qualities to the brainstorming web after watching the video(s). Learners may suggest additional qualities such as brave, *Ingenious*, resilient, or persistent.

Acquiring and Applying

- Provide learners with a list of Canadian innovators as outlined below from the books *Ingenious*/innovation Nation, or develop a new list of current innovators based on a topic of study or interests/abilities:

  Glenn Gould: Musician
  Charles Higgins: Hormone Treatment for Cancer
  Wendy Murphy: Weevac
  Nyle Ludolph: Blue Box Recycling
  Robert Mawhinney: Dump Truck
  Margaret Newton: Elimination of Grain Rust
  Joseph Coyle: Egg Carton
  Mike Lazaridis: BlackBerry
  Jacques Plante: Goalie Mask
  Group of Seven: Artists

- Consider introducing learners to the recipients of the Governor General Innovation Awards from 2016, 2017, and 2018 as current Canadian innovators who have made an impact such as Mary Gordon, Tom Chau, Bonnie Mallard, Paul Santerre and others.
- Organize learners into groups of 4-6 people. Assign one Canadian innovator for each group to research as well as an Innovator Exploration sheet (Appendix 4A, 4B). Learners may complete the research using books, Internet sites, videos, interviews etc. (For younger learners, educators may want to develop predetermined innovator profiles to help narrow the focus). At the end of the activity, each group member will be an expert on their innovator.
- After the research is completed, regroup learners into sharing groups. The new groups will include one innovator expert from each research group. Learners can now share their findings, resulting in all students having common knowledge of all innovators.
- Use the 'Innovation for Good' document in this resource for discussion and comparison of qualities of innovators
- Expand sharing and collective learning by posting the Innovator Exploration sheets in the Innovation Space, a D2L (Desire2Learn) class site, or Google Classroom.

Consolidation and Conclusion

- Ask learners to reflect on the qualities of an innovator by using Appendix 4C, 4D. This assessment may be completed as a self-evaluation or learners can use it to interview their peers or parents. This activity can be expanded to encourage continued research at home or in the community. Learners may wish to interview an innovator in person or virtually for their community connection.
- Revisit the list of innovator qualities at the end of the activity, and again after the Innovation Project is completed to determine changes and developments in the individual learner's innovator qualities, requiring the inclusion of specific examples of their growth from project experiences.

Assessment

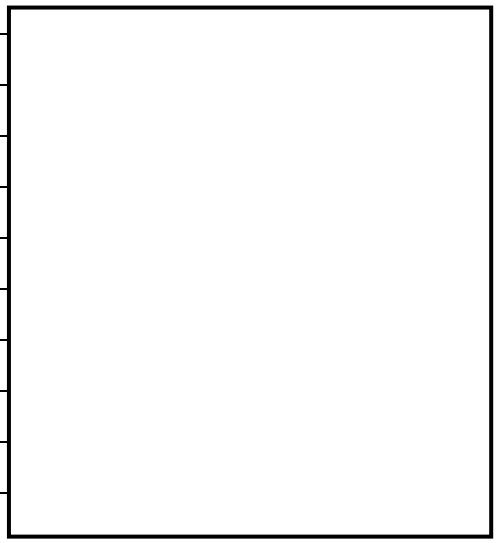
Strategy: Expert Groups, Innovator Exploration Activity Sheet (4A, 4B)
Tool: Self Evaluation of Innovator Qualities (4C, 4D), Rating Scale (4E)

Educators can assess learners' understanding of innovator qualities by evaluating observations from the Innovator Exploration research activity and the Innovator Self-Evaluation.

Innovation Exploration

Select a Canadian Innovator or team and complete the following activity sheet.

1. Write information about the Canadian Innovator(s). Draw a picture of them or their innovation.



2. What did your innovator(s) create or improve?

3. What problems did the innovator(s) face?

4. How did they solve problems?

5. What qualities or characteristics do they have?

Innovation Exploration

Name of Canadian Innovator:

Innovation(s) created by the Canadian Innovator:

How did the Canadian Innovator or team demonstrate the following?

1. Persistence

2. Collaboration

3. Problem-solving skills

4. Initiative

5. Empathy and care

6. Resilience

7. Strong work ethic

Evaluating Innovator Qualities

What innovator qualities do you have? Shade the expression that best represents you.

Innovator Quality	Not at All	Sometimes	All the Time
I am persistent. *I stay focused when innovating gets difficult.*	☹	😐	☺
I work well with others. *I share tasks and responsibilities.*	☹	😐	☺
I problem-solve. *When I encounter a problem, I think of a new solution.*	☹	😐	☺
I am proactive. *I work on my own to start a task.*	☹	😐	☺
I am kind. *I think of others and help my peers.*	☹	😐	☺
I am resilient. *If my innovation does not work I try again.*	☹	😐	☺
I work hard. *I work hard to reach my goals.*	☹	😐	☺

1. What quality do you think is the most important for an innovator to have? Why?

2. How would you demonstrate that quality?

Evaluating Innovator Qualities

Use the following rating scale to evaluate your own innovator qualities. Circle one of the numbers to describe how frequently you demonstrate each quality.

RATING	1 (never)	2 (sometimes)	3 (frequently)	4 (always)
Persistence:	1	2	3	4
How do you demonstrate being persistent?				
Collaboration:	1	2	3	4
When do you use collaboration skills?				
Problem-Solving:	1	2	3	4
How do you use your problem-solving skills?				
Initiative:	1	2	3	4
How do you show initiative?				
Kindness:	1	2	3	4
How do you express kindness?				
Resilience:	1	2	3	4
How are you a resilient innovator?				
Strong work ethic:	1	2	3	4
How do you have a strong work ethic?				

Innovator Qualities Assessment

Check for understanding. How does the learner:

- Examine the qualities of innovators (i.e., persistence, creativity, collaboration, resourcefulness);
- Research and explore these qualities through biographies of Canadian innovators;
- Self-reflect on personal qualities as related to innovators.

Student Name	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent

Notes:

Learning Experience 5

What is the Innovation Cycle?

Background

The process of innovation is complex. It can be described as cyclical and repetitive, yet it does not always follow a specific pattern as innovators often revisit phases within the Innovation Cycle. The four phases of the Innovation Cycle include: Inquiry, Ideation, Incubation, and Implementation with Impact as a consideration of each phase. The most important purpose of innovation is Impact, which is at the center of innovation and overlaps and intersects with every phase. Innovators need to determine what impact they wish to make when creating an innovation. Usually an innovation solves a problem or addresses a need, but it also can make an impact by integrating and improving various ideas.

There are various aspects within each phase of the Innovation Cycle such as: **investigation, inspiration, imagination, iterations, improvements, intellectual property,** and **investments**. All of these aspects are important to the Innovation Cycle.

The four phases of the Innovation Cycle include an icon to help learners associate aspects and terms with each phase. The question mark signifies investigating in the Inquiry phase; the sky symbolizes that the sky is the limit in the Ideation phase; the egg of the Incubation phase symbolizes testing, growth and improvement in the incubation phase; and the Go symbol of the Implementation phase represents the innovation being ready for action.

Learning Goals

- Examine the four phases of an Innovation Cycle.
- Apply knowledge of the aspects within each phase.
- Demonstrate collaboration in developing a common understanding of innovation.
- Develop problem-solving skills in determining innovation phases and aspects.

Resources

- Video: How Do Innovators Innovate? https://canadianinnovationspace.ca/resources/what-exactly-is-innovation
- Large signs with the words: Inquiry, Ideation, Incubation, Implementation, and Impact
- Chart paper, Post-It Notes, markers
- Grades 1-6: How YOU can be an Innovator (Appendix 5A)
- Grades 4-8: Phases and Aspects of the Innovation Cycle (Appendix 5B)
- *Innovation Nation* Graphic of How You Can Be an Innovator (Appendix 5C)
- Graphic of Innovation Cycle (Appendix 5D)
- Graphic of Innovation Cycle with aspects (Appendix 5E)
- Small strips of paper with words and phrases (Appendix 5F)
- Observation Chart (Appendix 5G)

Activating

- Ask learners about different cycles they may be aware of (e.g., the water cycle or the life cycle).
- Explore such questions as: What are the features of a cycle? What are the steps of an experiment? What are the parts of a recipe? How are these cycles or processes alike or different? Learners might say that all processes have certain parts/stages and sometimes they are not linear and each part of the cycle can be revisited.
- Watch the video How Do Innovators Innovate? Discuss the Innovation Cycle. As a group, review the video and the information shared. Provide learners with a review of the terms related to the Innovation Cycle as well as a copy of the graphic (Appendix 5E).

Acquiring and Applying

- Using the four-corner activity format, label each corner of the classroom with signs representing one phase of the Innovation Cycle (Inquiry, Ideation, Incubation, and Implementation) and put a sign for Impact in middle. Signs may be colour-coded to match the four colours for each phase.
- Organize learners into four equally-sized groups, as possible. Assign each group to one corner/phase of cycle. Do not assign learners to the Impact station.
- Provide young children with easier words to describe the stages such as Asking, Planning, Testing, and Sharing. The word Difference could replace Impact.
- Direct learners to brainstorm questions and activities that take place within the phase of the cycle in their corner. For example, learners may suggest that in Inquiry, innovators do research and investigate issues. In Ideation, learners might indicate that innovators develop ideas, work with others and integrate ideas. Learners can record their brainstorming notes on pieces of chart paper or Post-It Notes.
- Encourage learners to notice that Impact plays a role in each phase. For example, in the Inquiry phase, innovators need to consider past innovations and their impact. In the other phases, impact continually needs to be assessed and the innovation may need to be altered/improved for greater impact.
- OPTION: Show the list of aspects (Appendix 5A, or 5B depending on the grade). Make sure that the list is not in order of the phases. Discuss the various aspects.
- Encourage learners to recognize that all the words start with the letter I, as a means for remembering these terms.
- OPTION: Cut up the list of aspects in Appendix 5F. After a brainstorming session, give each learner one word and have them decide where the word fits in the cycle. They could also take their word to the corner they think their aspect belongs to.
- Discuss learner choices and compare to Appendix 5D. Discuss any differences and the possibility that aspect can be in more than one phase.

Consolidation and Conclusion

- Have learners return to their desks and discuss the words they used to describe each phase or add the aspect to a blank template of the Innovation Cycle to further consolidate the four phases (similar to Appendix 5E).
- Discuss how impact (difference, effect) is considered in each phase of the Innovation Cycle.

- Learners could also create an Innovation Cycle poster for their Innovation Space. For younger learners, this could be a group activity using an interactive white board or a group Google Doc.

Assessment

Strategy: Four Corners Activity, Innovation Cycle Aspect Strips (5F)
Tool: Observation Chart (5G)

Educators may observe how learners collaborate in the four-corner activity and contribute to the discussion about the phases and aspects of the Innovation Cycle. The activity of matching aspects to the phases of the Innovation Cycle could be reviewed as formative assessment for learning, to inform the educator of the need for further clarification (Appendix 5G).

How can YOU be an Innovator?

INQUIRE (RED Phase: Ask, Question, and Investigate)

Investigate Issues and Solutions

- Investigate past innovations and present issues.
- What or who inspires you?
- What can you learn from past and present innovations?
- Imagine what your innovation looks like.
- What do you need to create it?
- Why is this innovation needed?
- What are the problems or issues that it addresses?

IDEATE (BLUE Phase: The sky is the limit)

Develop Ideas and Create the Innovation

- Who can you work with to develop your idea—friends, family, classmates, parents, teachers, experts?
- How can you design your innovation while making connections with other ideas?
- How will you stay motivated when facing challenges?
- What impact do you want your innovation to have?

INCUBATE (PURPLE Phase: Test, Improve, and Grow)

Test and Revise Your Ideas

- What challenges are you facing?
- How will you test your innovation and make changes based on the feedback you receive?
- Are there different versions of the innovation that might work better?
- Is the innovation having the impact you wanted?

IMPLEMENT (ORANGE Phase: Act and Share)

Put Your Innovation into Action

- What is your plan for implementing your innovation? (Marketing, Materials, Budget, Schedule)
- What roles do other team members have?
- How can you protect your innovation idea?
- Do you need any other resources?
- Should you register your innovation?
- How will you measure success?

Phases and Aspects of the Innovation Cycle

Inquiry (RED Phase: Ask, Question, and Investigate)

Innovators inquire and ask questions. The Inquiry phase includes:

- Inspiration: What or who inspires innovators?
- Investigation: What can be learned from past and present innovations?
- Imagination: How can an innovation be envisioned or created?
- Impact: What are the issues or problems that need to be addressed?

Ideation (BLUE Phase: The sky is the limit)

Innovators engage in developing ideas and designing the innovation. The Idea phase includes:

- Interaction: Who can innovators work with such as mentors, peers and experts?
- Integration: How are links and connections of various ideas made?
- Initiative: What is the drive and motivation needed to develop an innovation?
- Impact: What are the intended goals of the innovation?

Incubation (PURPLE Phase: Test, Improve, and Grow)

Innovators need time to test and modify ideas in the Incubation phase. The Incubation phase includes:

- Impediments: What are the possible challenges or obstacles?
- Improvements: How can the innovation be changed or enhanced based on feedback?
- Iterations: What different versions of the innovation may work better?
- Impact: Is the innovation meeting the intended impact goal?

Implementation (ORANGE Phase: Act and Share)

Innovators need to put their ideas into action. In the implementation phase, innovators plan for the final design of the innovation, marketing, materials, budget, responsibilities and timelines. The fourth phase includes consideration of:

- Intellectual Property: How is the innovation idea protected?
- Investment: Is there a need for resources or investors to support the innovation?
- Incorporation: Should the innovation be registered as a business or organization?
- Impact: What are the indicators of impact? How is success assessed and has the innovation achieved the intended goals?

HOW YOU CAN BE AN INNOVATOR

Inquire
Investigate Issues and Solutions

- Investigate past innovations and present issues.
- What or who inspires you?
- What can you learn from past and present innovations?
- Imagine what your innovation looks like. What do you need to create it?
- Why is this innovation needed? What are the problems or issues that it addresses?

Ideate
Develop an Idea

- Who can you work with to develop your idea—friends, family, classmates, parents, teachers, experts?
- How can you make connections with other ideas?
- How will you stay motivated when facing challenges?
- What impact do you want your innovation to have?

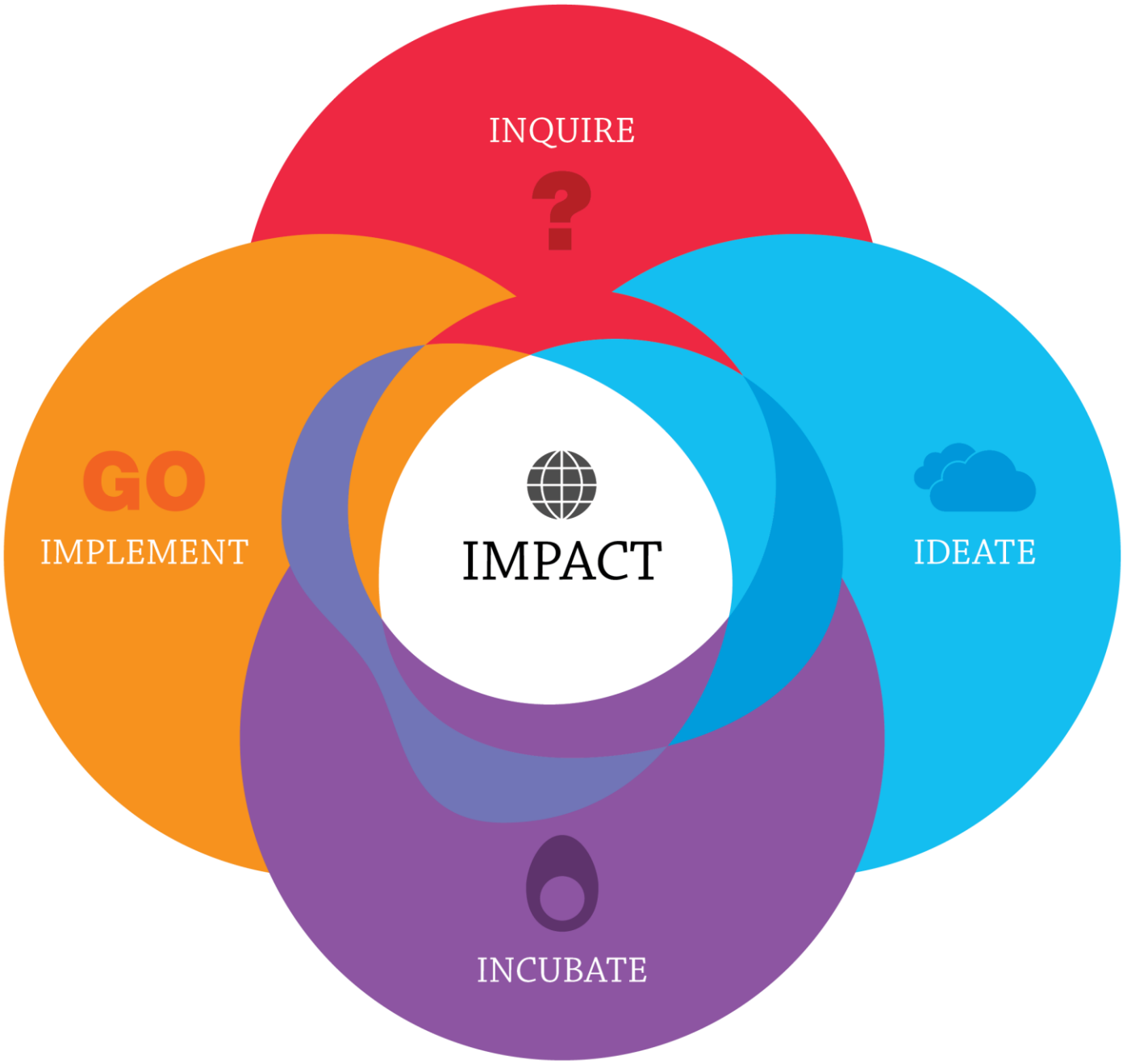
Incubate
Test and Revise Your Ideas

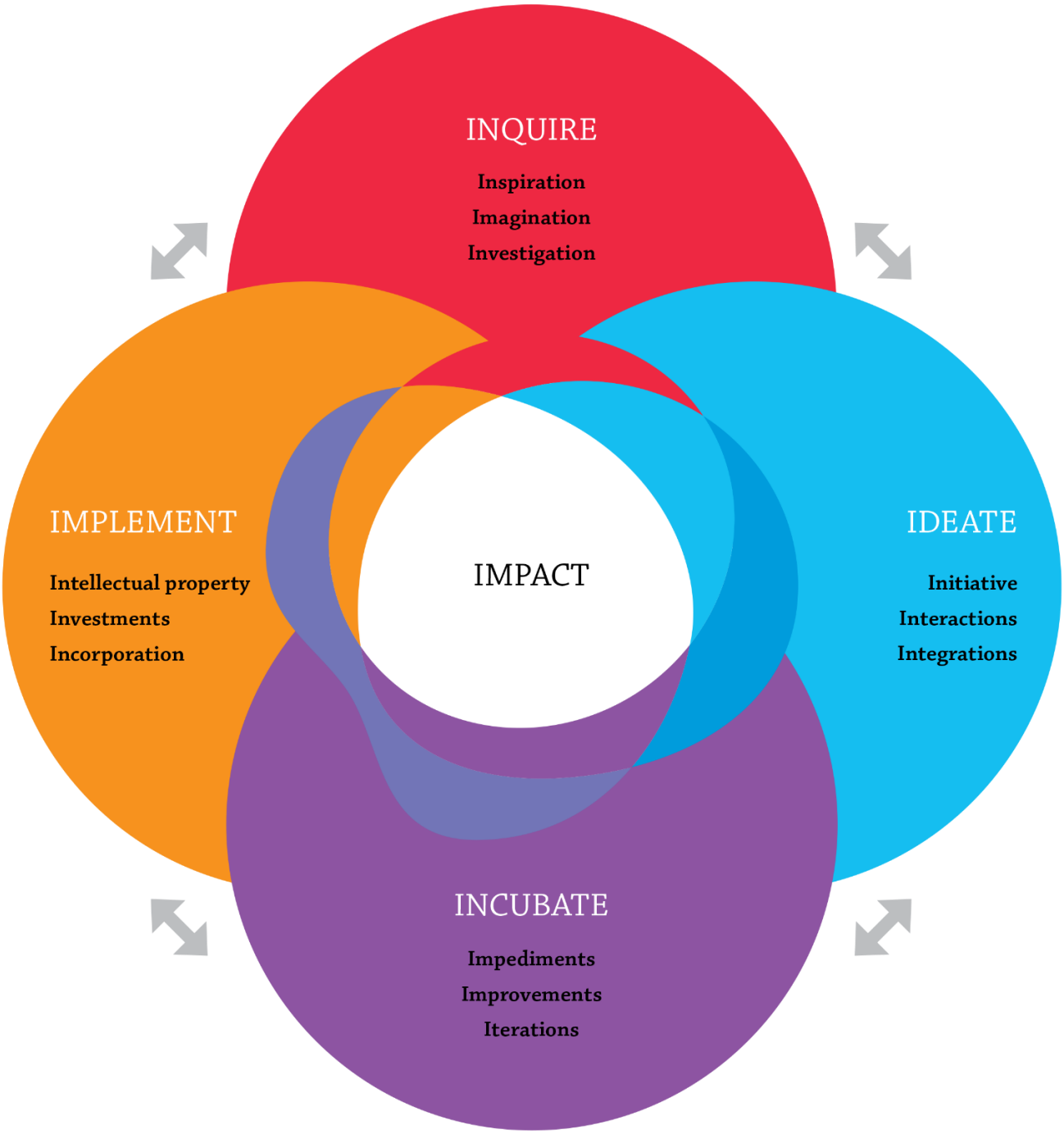
- What challenges are you facing?
- How will you test your innovation and make changes based on the feedback you receive?
- Are there different versions of the innovation that might work better?
- Is the innovation having the impact you wanted?

Implement
Put Your Innovation into Action

- What is your plan for making and promoting your innovation?
  - design
  - marketing
  - materials
  - budget
  - schedule
- What roles do other team members have?
- How can you protect your innovation idea?
- Do you need any other resources?
- Should you register your innovation?
- How will you measure your success?

Excerpt from *Innovation Nation*, 2017.


INQUIRE
?
GO
IMPLEMENT
IMPACT
IDEATE
INCUBATE


INQUIRE
Inspiration
Imagination
Investigation
IMPLEMENT
Intellectual property
Investments
Incorporation
IMPACT
IDEATE
Initiative
Interactions
Integrations
INCUBATE
Impediments
Improvements
Iterations

inspiration

imagination

investigation

initiative

interactions

integration

impediments

improvements

iterations

intellectual property

investments

incorporation

The Innovation Cycle Assessment

Check for understanding. How does the learner:

- Apply knowledge of aspects within each innovation phase;
- Collaborates in developing a common understanding of innovation;
- Develop problem-solving skills in determining innovation phases and aspects.

Student Name	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent

Notes:

Learning Experience 6

What is an Innovation Project?

Background

In this activity, learners are familiarized with the expectations for an Innovation Project and begin to brainstorm ideas based on past inquiries and research. The Innovation Project is the culminating activity or capstone project of the Innovation Learning Experiences. It is a cross-curricular project that should ideally be completed by a small group of learners with a similar interest. All of the Innovation Projects could be based on one curriculum area or topic such as Communications, Agriculture, Social/Community, Arts, Sports, or Health depending on the curriculum focus of the unit. Alternatively, if the educator has provided a broad perspective on innovation across sectors, learners may be encouraged to undertake a range of Innovation Projects that are cross-curricular in nature. Learners will work together to undertake their own innovations, which can be either a creation or an improvement of a product or process.

The impact the learners wish to make should guide the development of the Innovation Project. For example, if they wish to impact poverty issues, their Innovation Project may be focussed on an improved means of providing food to the homeless. If learners wish to impact forms of arts or entertainment, they may design a new form of dinner-musical based on an iteration of dinner theatre, combining dinner and drama. Some learners may wish to impact the field of communications and develop a new form of wearable communication technology. If increased safety is the desired impact, learners may wish to design childproof match containers. The Innovation Project should allow learners to be immersed in all phases of the Innovation Cycle by inquiring, investigating, researching, creating, making, testing, improving, sharing/selling, communicating, and celebrating their innovation.

Innovation Projects will address various skills and competencies by integrating curriculum areas such as: Language, Mathematics, Arts, Science, Technology, Social Studies (History/Geography), Physical Education and Health.

Learning Goals

- Analyze the expectations of the Innovation Project.
- Determine the impact – the ethical considerations of the Innovation Project.
- Understand the steps and roles involved in completing the Innovation Project.
- Brainstorm possible innovations for their project (e.g., the entrepreneurial approach).

Resources

- *Ingenious* and *Innovation Nation* by David Johnston and Tom Jenkins
- Innovation Project Outline (Appendix 6A)
- Innovation Project Rubric (Appendix 6B)
- Grades 1-6: Innovation Project Brainstorming Sheet (Appendix 6C)
- Grades 4-8: Innovation Project Brainstorming Sheet (Appendix 6D)
- Innovation Brainstorming Assessment (Appendix 6E)
- Technology device(s) with access to writing software or library for research and ideation

- Innovation Project Portfolio/File (could be electronic)

Activating

- Ask learners to share projects they have completed in other grades/classes. Inquire: Were those projects making something new? What were the steps involved in completing a project? Did their parents complete a home project? What was needed? What were the steps involved?
- Introduce the Innovation Project using the project outline (Appendix 6A). This project will be completed over a series of work periods and activities. In small groups, learners will be working to develop or improve an innovation. Together, they will be working through the phases of the Innovation Cycle to create a product or process that will address their desired impact.

Acquiring and Applying

- Review the phases of the Innovation Cycle and explain that the Innovation Project is designed to work through the phases.
- Engage learners in discussing and inquiring about an innovation that could be further improved for greater impact. Discuss how they might try to solve an issue they are interested in. Learners can refer to the previous activities, look in newspapers, online or in *Ingenious* and *Innovation Nation* to help develop their ideas.
- Form groups to develop the Innovation Project either based on common interests or based on complementary skills and abilities.
- Have the groups brainstorm their Innovation Project by completing the template (Appendix 6C, 6D) either in paper or electronic form.
- Begin to organize materials for an Innovation Project Portfolio, which will serve to guide and record the innovation process. This portfolio should consist of a collection of activity sheets, artifacts, designs and graphic organizers. Innovation Portfolios can be created for each group or for individuals.
- Encourage learners to develop lists of materials they might need to create their innovation prototype.

Consolidation and Conclusion

- Present the Rubric (Appendix 6B) that will guide the development of the Innovation Project.
- Ask learners to begin to determine their roles in the Innovation Project. All learners should work on the design, but based on the brainstorming sheet, some learners may wish to assume roles: e.g., Project Manager, Marketer, Accountant, Resource Acquisitions, Tester, Timekeeper, Presenter, etc. (Appendix 7A).
- Invite learners to present their initial brainstorming ideas for an Innovation Project and the impact they wish to make.

Assessment

Strategy: Innovation Project Outline (6A), Innovation Brainstorming Activity Sheet (6C, 6D)
Tool: Innovation Project Rubric (6B), Anecdotal Notes (6E)

As learners begin to plan their innovation, educators may want to make anecdotal notes on the brainstorming sheet concerning each group's progress, initiative, problem solving, etc. (Appendix 6E). These notes can be collected throughout the Innovation Project and later used as a point of reference during the final grading of the project.

The Innovation Project

Canadian innovators have been making the world smarter, smaller, kinder, safer, healthier, wealthier and happier for years! We have been learning about some fascinating Canadian innovations that we encounter daily. Canadians have made a significant impact on the world and now it is time for you to make an impact by planning an innovation with your peers!

Innovating is challenging, but it is also an exciting process where you can design, plan, create, test, improve, share and celebrate an innovation! One of the best parts of innovating is that it is something you can do with people who share similar interests. Perhaps you and your peers want to plan a new communication device, or maybe you wish to plan a new club, business or a new way of recycling. The sky is the limit!

By working through some activities, your Innovation Group will develop an innovation using your knowledge of the Innovation Cycle. Together, you will inquire about a past innovation or current problem, develop an idea, incubate and test the innovation, and implement it – all while trying to make a positive impact!

As you move through the Innovation Cycle, you will develop your own Innovation Portfolio, which includes an Innovation Project Package addressing each of the four phases of innovation. You will also work together to complete a detailed budget and marketing plan to help determine how you will share your innovation. To celebrate our achievements, we will be hosting an Innovation Celebration where each group will present their innovation to a special audience!

Please keep your Innovation Project Package, the rubric and all samples of work in your Innovation Portfolio.

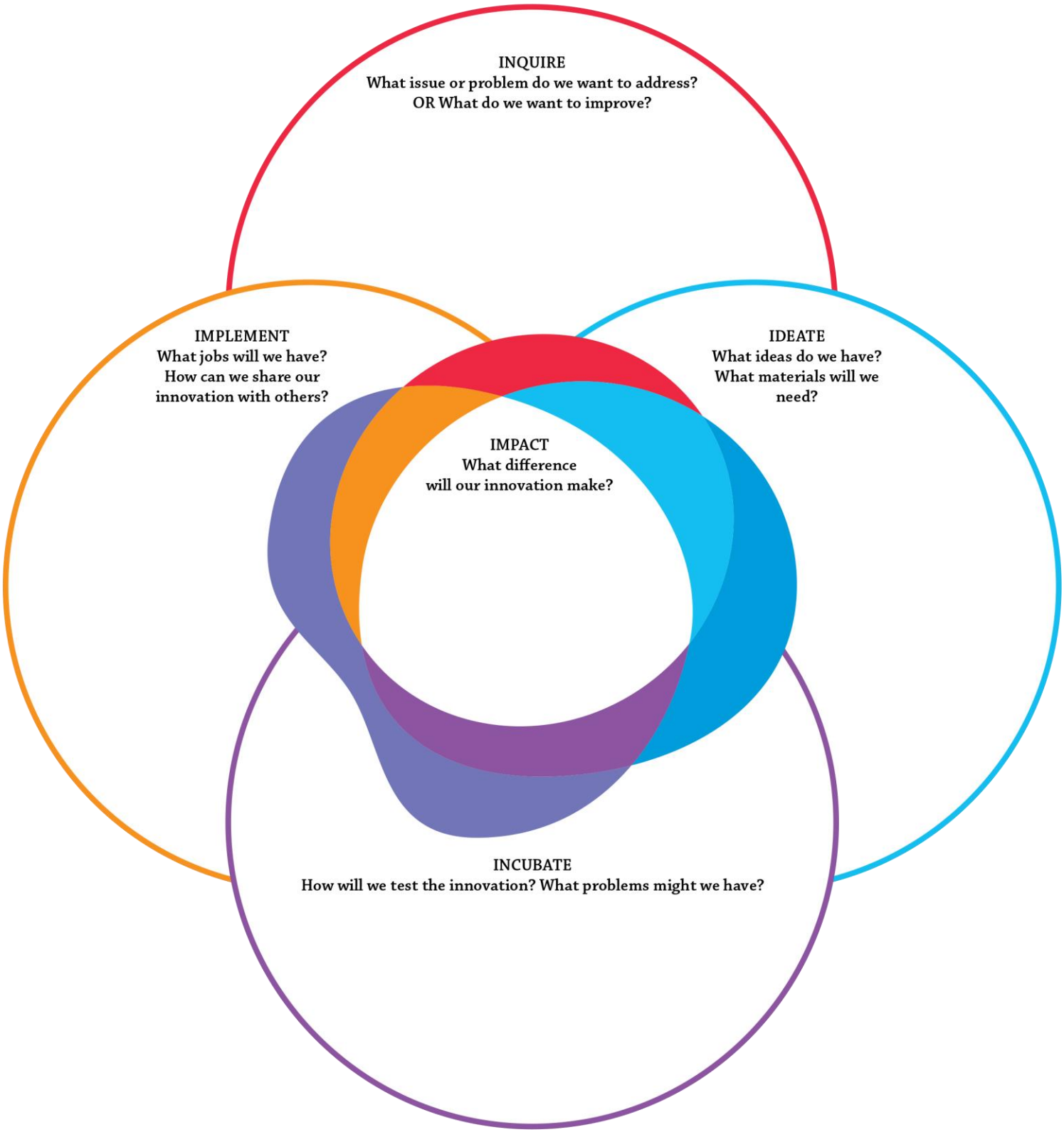
Good luck and happy innovating!

Innovation Project Rubric

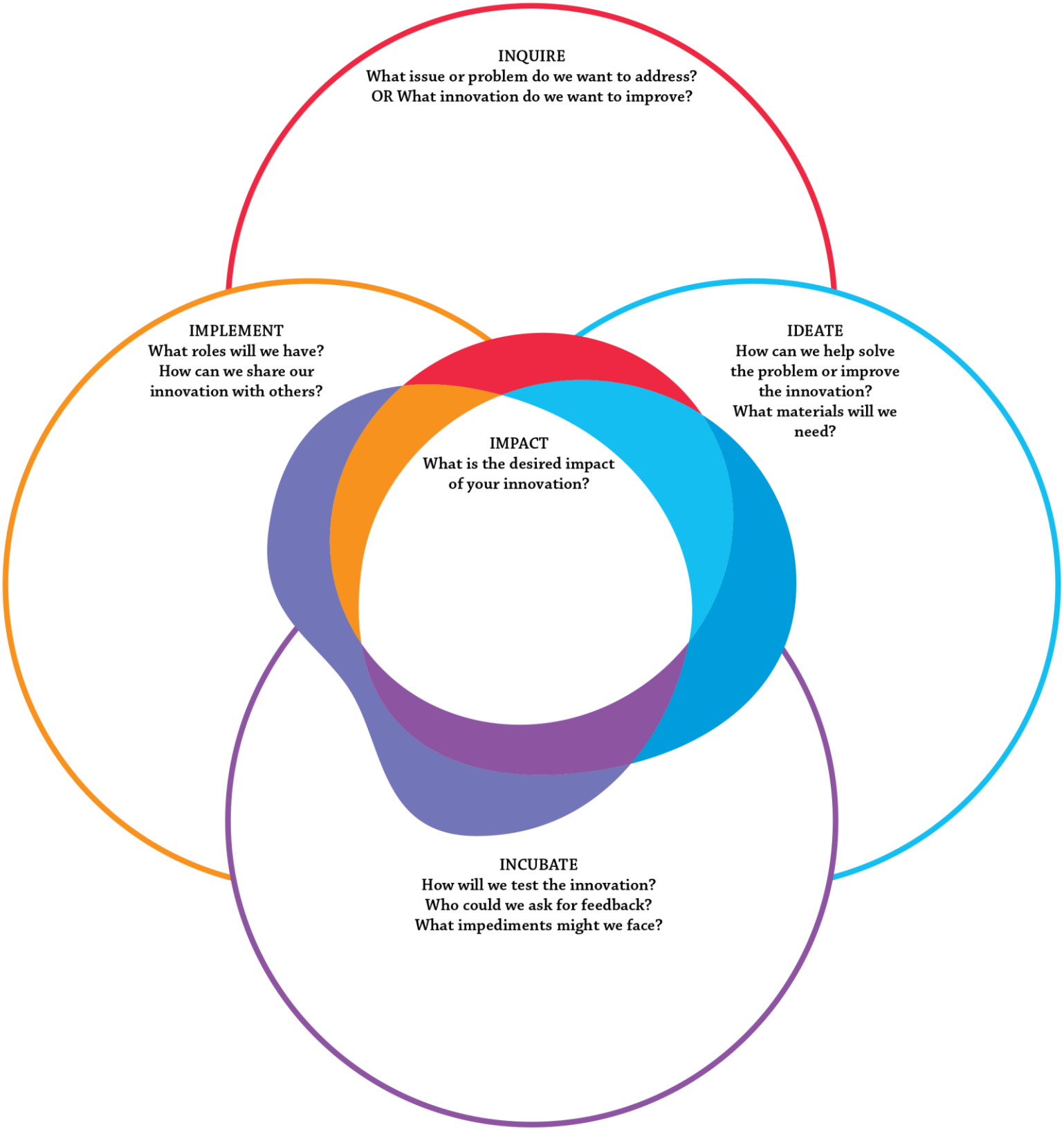
Innovators: **Innovation:**

	Level 1	Level 2	Level 3	Level 4
Knowledge & Understanding	Learners demonstrated limited knowledge based on little prior inquiry to develop an innovation.	Learners demonstrated some degree of knowledge based on minimal prior inquiry to develop an innovation.	Learners demonstrated a considerable degree of knowledge based on prior inquiry to develop an innovation.	Learners demonstrated a high degree of knowledge based on inquiry to develop an innovation that met a desired impact.
Thinking	Learners demonstrated limited planning, creative thinking, and problem-solving skills in the development of their innovation.	Learners demonstrated some planning, critical thinking, and problem-solving skills in the development of their innovation.	Learners demonstrated considerable planning, critical thinking, and problem-solving skills in the development of their innovation.	Learners demonstrated a high degree of planning, critical thinking, and problem-solving skills in the development of their innovation.
Communication	The learners presented their innovation with limited clarity, persuasion or effectiveness for different audiences and purposes.	The learners presented their innovation with some clarity, persuasion and effectiveness for different audiences and purposes.	The learners presented their innovation with considerable clarity, persuasion and effectiveness for different audiences and purposes.	The learners presented their innovation with a high degree of clarity, persuasion and effectiveness for different audiences and purposes.
Application	Learners applied limited knowledge or skills of the Innovation Cycle to their innovation. Learners demonstrated limited application of an ethical and entrepreneurial approach to pursue an innovation to meet a societal need.	Learners applied some knowledge and skills of the Innovation Cycle to their innovation. Learners sometimes applied an ethical and entrepreneurial approach to pursue an innovation to meet a societal need.	Learners applied considerable knowledge and skills of the Innovation Cycle to their innovation. Learners applied an ethical and entrepreneurial approach to pursue an innovation to meet a societal need	Learners applied a high degree of knowledge and skills of the Innovation Cycle to their innovation. Learners effectively applied an ethical and entrepreneurial approach to pursue an innovation to meet a societal need

Name: _____


INQUIRE
What issue or problem do we want to address?
OR What do we want to improve?
IMPLEMENT
What jobs will we have?
How can we share our
innovation with others?
IDEATE
What ideas do we have?
What materials will we
need?
IMPACT
What difference
will our innovation make?
INCUBATE
How will we test the innovation? What problems might we have?

Name: _____


INQUIRE
What issue or problem do we want to address?
OR What innovation do we want to improve?
IMPLEMENT
What roles will we have?
How can we share our innovation with others?
IDEATE
How can we help solve the problem or improve the innovation?
What materials will we need?
IMPACT
What is the desired impact of your innovation?
INCUBATE
How will we test the innovation?
Who could we ask for feedback?
What impediments might we face?

Innovation Project Brainstorm Assessment

Check for understanding. How does the group:

- Analyze the expectations of the Innovation Project;
- Determine the impact and the ethical considerations of the innovation;
- Understand the steps and roles involved in completing the project;
- Begin to brainstorm possible innovations for the project (e.g., entrepreneurial approach).

Names	Observations

Learning Experience 7

How is an Idea Developed?

Background

This learning experience encompasses a series of activities for learners to develop, design, plan, make and refine their innovation. Learners are encouraged to collaborate as a team to develop their innovation by integrating their various ideas and viewpoints. They may be inspired by Canadian innovators and innovations and apply their new knowledge to the development of their innovation. These activities will take a number of class periods. The Innovation Project may also require guidance from older peers or adults, depending on the age of the learners. The educator may also decide to collaboratively develop an Innovation Project with the whole class. The Ideation Phase of the Innovation Cycle includes the design and creation of the innovation model. In some cases, the innovation may be an actual product and in other cases, the innovation may be a proposal for a process, service, or organization. Access to the Innovation Space materials and research tools are necessary throughout this phase.

Learning Goals

- Apply knowledge of Canadian innovations and their successes.
- Develop an idea into an innovation by considering the impact it will have on the world.
- Work collaboratively to develop a plan for their desired innovation by referring to the phases of the Innovation Cycle.
- Demonstrate an understanding and application of the roles of innovation teams.

Resources

- *Ingenious* and *Innovation Nation* by David Johnston and Tom Jenkins
- Innovation Space (See Activity 3)
- Materials such as: paper, glue, popsicle sticks, post-it notes, tape, cardboard stock, printer, 3D printer if available, decorative materials, paper clips, stapler, etc.
- Access to research tools
- Artifacts or images of Canadian innovations
- Video: Innovation Example Sharing Our Innovation: 'The Relens': https://goo.gl/tPXUJh
- Video: How to Be an Inventor! | Kid President: https://goo.gl/caApbr
- Video: How Do Innovators Innovate? https://canadianinnovationspace.ca/resources/what-exactly-is-innovation/
- Grades 1-6: Innovation Project Package (Appendix 7A)
- Grade 4-8: Innovation Project Package (Appendix 7B)
- Grades 1-6: Group Assessment (Appendix 7C)
- Grade 4-8: Group Assessment (Appendix 7D)
- Educator Assessment (Appendix 7E)

Activating

- Remind learners of the various Canadian innovations studied from the *Innovation Nation* or *Ingenious* book. This may be a good opportunity to revisit a favourite innovation story or briefly review images, artifacts, or videos posted in the Innovation Space. Some learners may want to discuss their favourite innovations in progress or share some of their innovation ideas from Experience 6.
- Engage learners further by sharing a video such as How to Be an Inventor! | Kid President. If educators would like to use a Canadian example, watch Sharing Our Innovation: 'The Relens', its exploration of Innovations should stimulate discussion and ideas.
- Show the video How Do Innovators Innovate as a reminder of the phases of innovation.

Acquiring and Applying

- Review the Innovation Brainstorming Sheet and explain to learners that they will be completing a detailed Innovation Project Package as they move through the phases.
- Introduce the Innovation Project Package (Appendix 7A, 7B) and allow learners time to develop their innovation idea and record their thoughts in detail.
- Remind learners that the Innovation Project Package will be stored in the Innovation Portfolio along with photos, sketches, research findings, etc.
- Provide multiple class periods to ensure learners have enough necessary to complete their design and plans for the innovation. In this phase, they will be completing the concept and creating the innovation. The subsequent phases (Incubation and Implementation) will be completed in Experience 8 and 9.
- Encourage learners to assume the roles discussed in Experience 6, but also allow cross-pollination of ideas, interactions, and integration.
- Invite learners to use the materials in the Innovation Space to make their prototype or to develop a presentation board showcasing their innovation, its design and plan. Learners should continue to develop lists of the items and materials will they need.
- Ask learners to develop a title, details, and a logo to align with their innovation idea. Use the innovation project template (Appendix 7A, 7B) and the suggested resources to help facilitate their planning.

Consolidation and Conclusion

- Provide learners with a space to store their innovation models. The innovation process takes time and might involve multiple ideation periods.
- Provide informal sharing time to promote and stimulate further ideas. Encourage Innovator Team members to explain their innovation during each phase of the innovation process.

Assessment

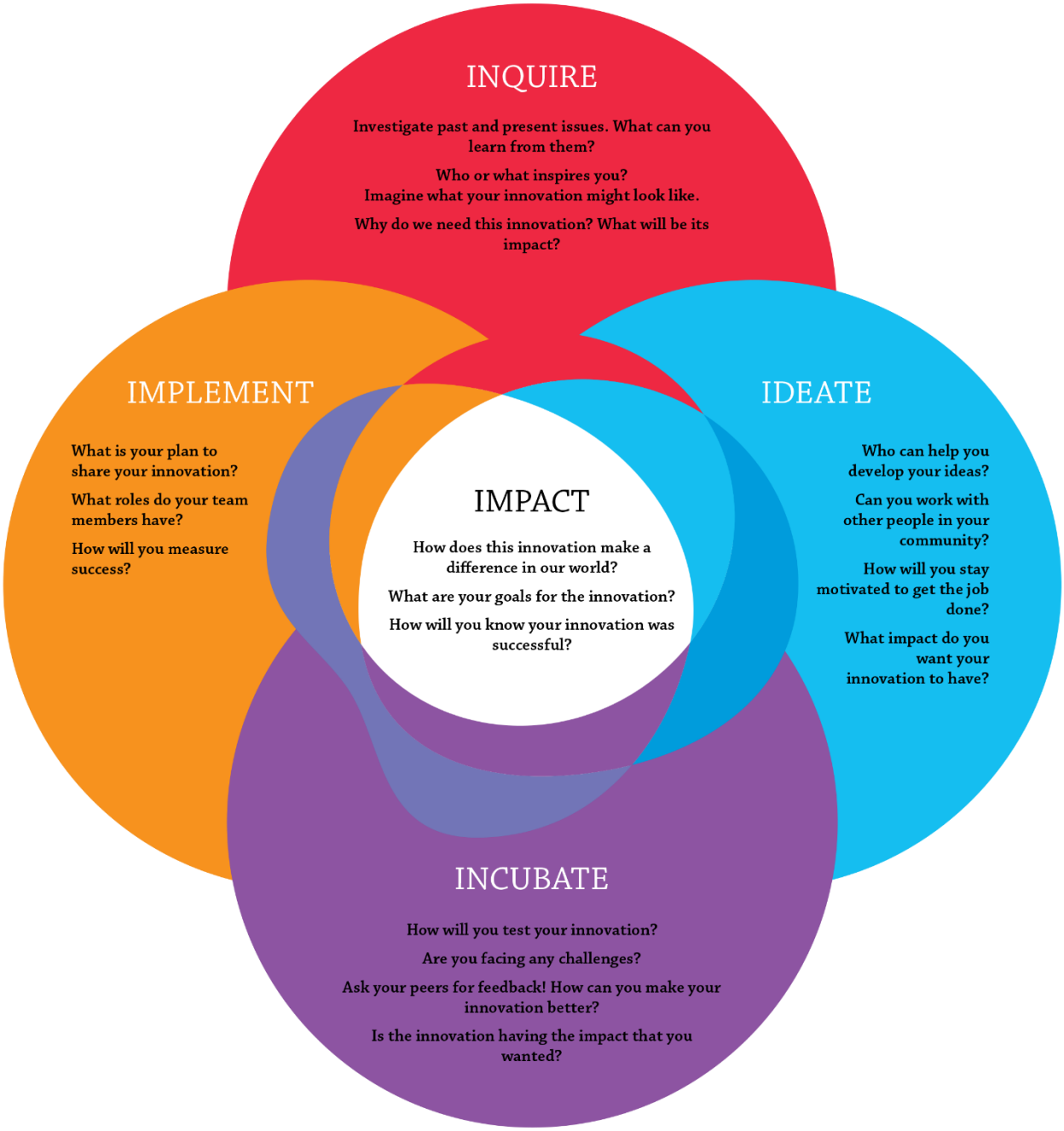
Strategy: Innovation Package Activity Sheets (7A, 7B)
Tool: Group Reflection Rubric (7C, 7D), Educator Rubric (7E)

> The Innovation Project Packages provided in the Appendices for Experience 7 can be used to develop an Innovation Portfolio. Learners can complete the packages as they move through

each phase of the Innovation Cycle. These packages provide learners with a means of communicating their understanding of innovation while demonstrating knowledge of literacy, media literacy, mathematics, and other related subject areas. Educators are encouraged to hold learner-educator conferences to meet with each group and assess innovation progress, collaboration, and additional learning skills. Conference assessments have been provided in the Appendices. Educators have the option to select either group evaluations to encourage collaboration and peer-assessment (7C, 7D) or the option to use the educator's assessment (7E). The assessments can be adapted to fit the needs of each learning environment or preferred conference style (i.e. individual or group conferencing).

Think and Act like an Innovator

Innovators create or improve a product (thing) or process (action) to make an impact (difference). Innovators look at our world and think about how they can make it better. They inquire about past ideas, inventions or processes and come up with ideas and plans to make them even better. Innovators put their ideas into action!



THE INNOVATION PROJECT

Innovation Topic: _____

1. INQUIRY

After researching some Canadian innovations, provide interesting facts about a past innovation.

_____

_____

_____

_____

_____

Why do you think innovation is important?

_____

_____

_____

_____

_____

Think about an innovation you have researched and imagine how you can make it better. What is a new innovation that is needed?

_____

_____

_____

_____

_____

What potential impact could this new innovation make?

_____

_____

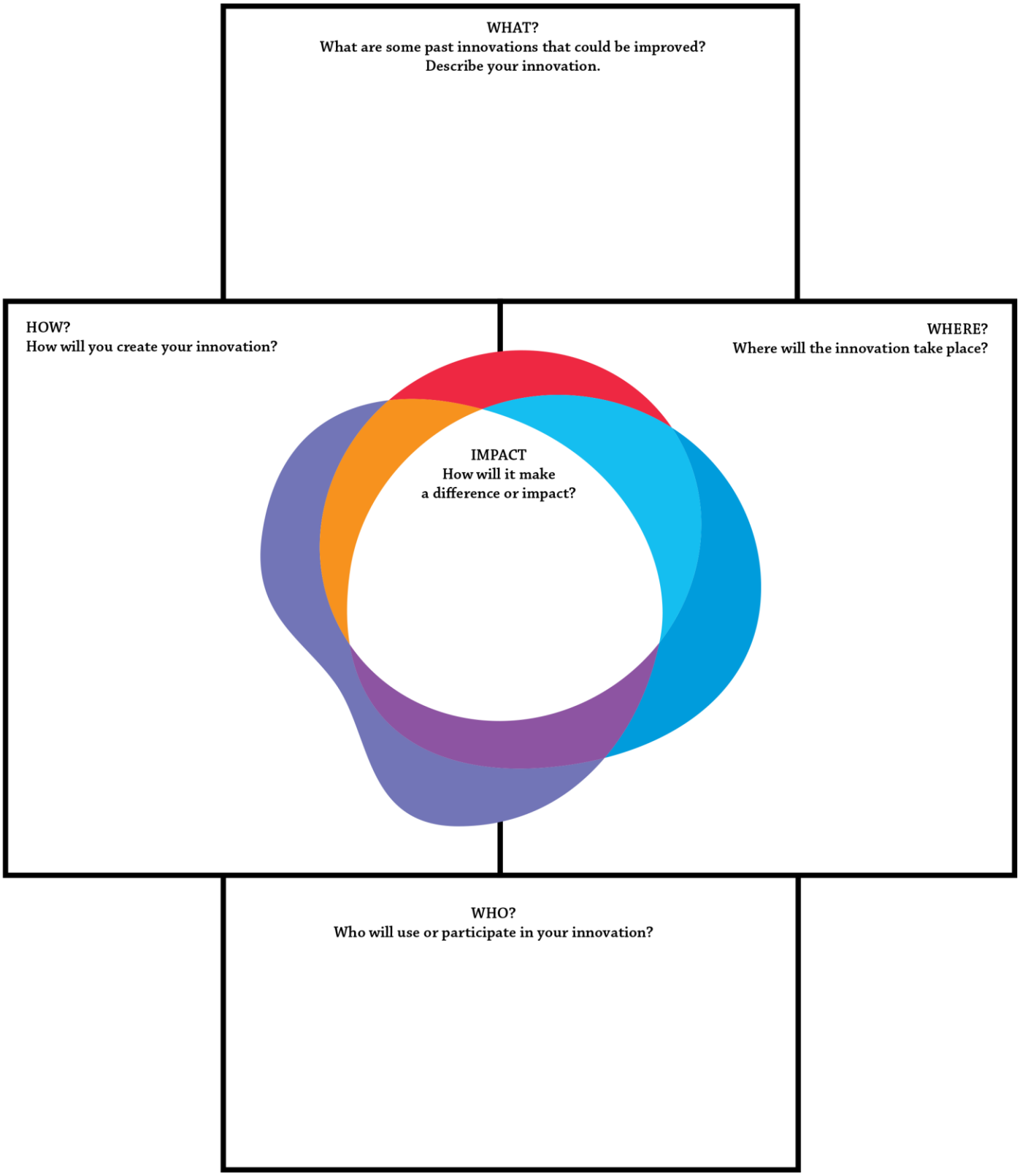
_____

_____

_____

2. IDEATION

Part A: Use the organizer to help develop an idea for your innovation. Remember to work with your team to create an idea for your innovation.



Part B: Draw a picture of your innovation and label the design. What are some of its features?

How will you make or create the innovation?

What do you need to create this innovation?

How will this innovation make an impact?

3. INCUBATION

After you have made either a prototype or a plan, it is time to test and improve your innovation. It is important to be sure your innovation is effective. You might want to experiment with your innovation or ask people if they like it.

How will you test your innovation?

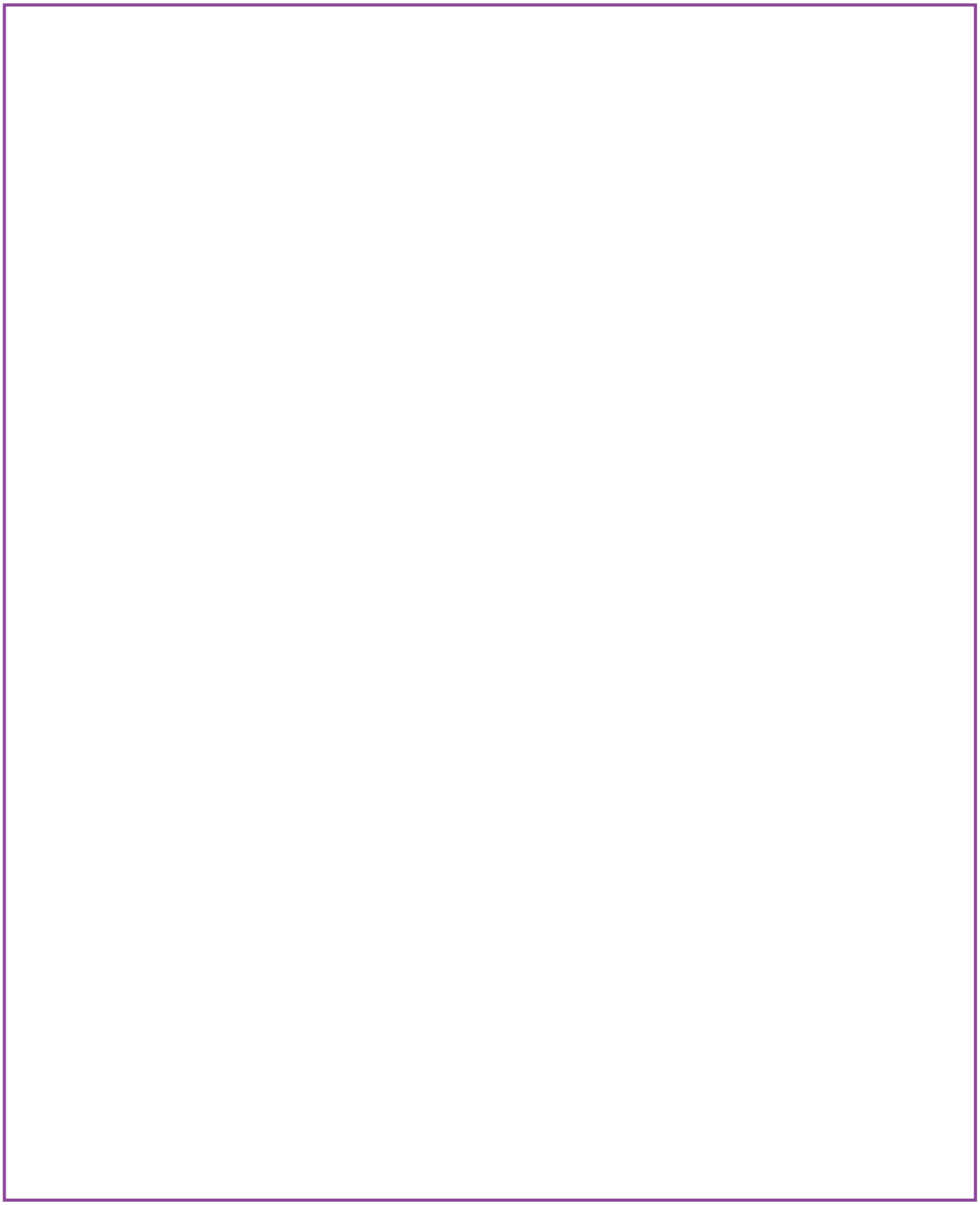
What problems did you have when you tested your innovation?

What did your peers or others think about your innovation?

Does the innovation have the impact that you wanted?

Think about both your peer feedback and your innovation tests. How can you improve your innovation to make it better?

Draw a picture of your improved innovation. Add some details explaining the improvements that your group is going to make.



4. IMPLEMENTATION

As a group, think about how you are going to share your innovation with others! Will you sell your innovation? Do you need support? Who is going to do each job? Do you need other jobs to help create your innovation?

Jobs	What We Need to Do
The Manager This person helps makes sure that everyone is on the right track. They help fix problems and make sure their team is working together.	
The Accountant This person decides what materials their team needs to build the innovation. The accountant researches the cost of materials and makes a budget to share with their team.	
The Salesperson This person thinks of different ways to sell and share the innovation. They might create a commercial or advertisement. They should also work with the team to figure out how much the innovation will cost.	
Other Roles:	

How will you make sure the innovation idea belongs to you?

Draw a sketch representing how you will communicate your innovation idea to others. Will you make a commercial or a poster?

After you share your innovation, how will you know that it was successful?

5. REFLECTION ON IMPACT

What were the goals of your innovation?

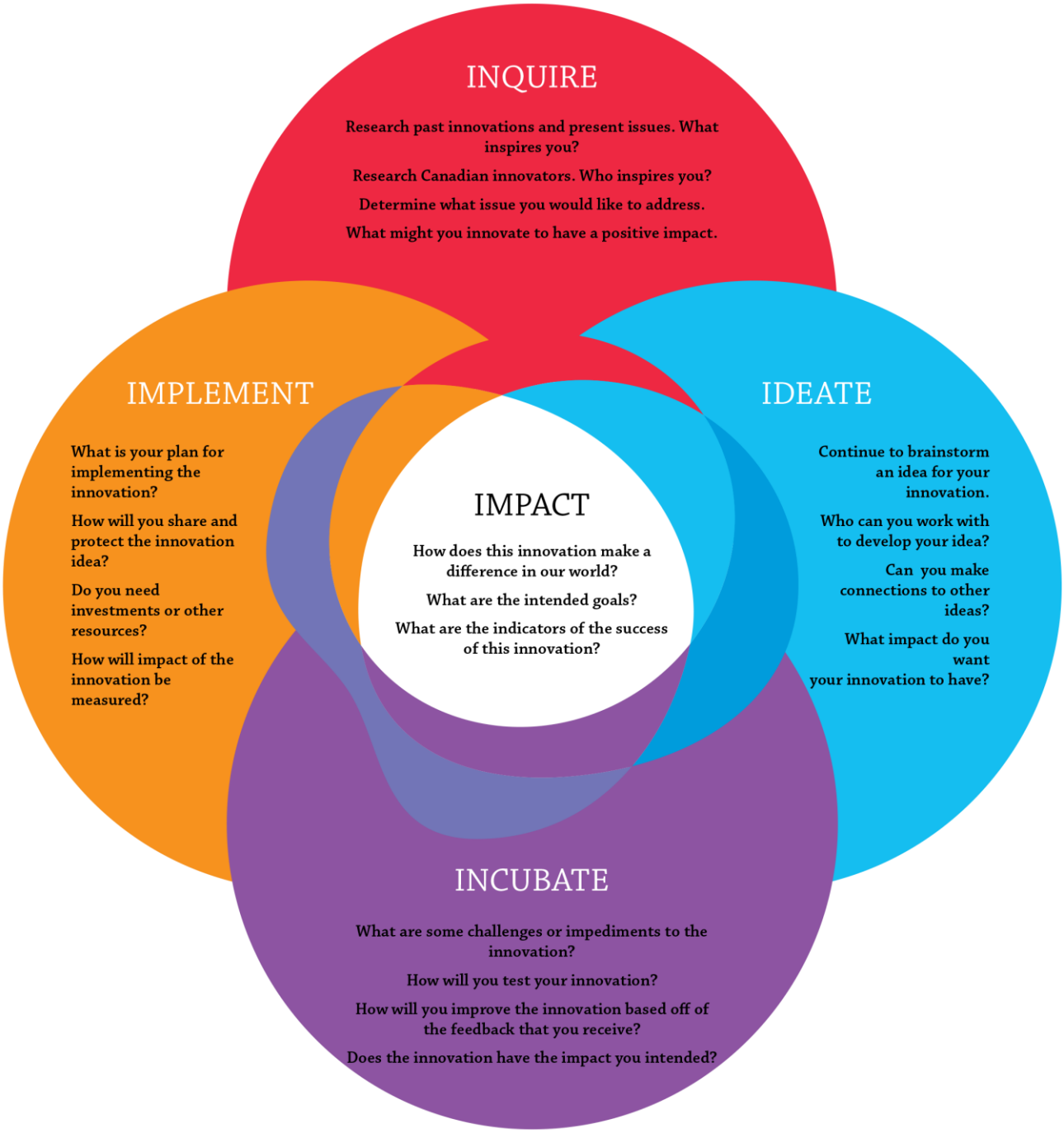
Did your innovation make an impact?

After sharing your innovation, describe how others liked your innovation.

How can you further improve your innovation? What are your next steps?

Think and Act like an Innovator

Innovators create or improve a product (thing) or process (action) to make an impact (difference). Innovators look at our world and think about how they can make it better. They inquire about past ideas, inventions or processes and come up with ideas and plans to make them even better. Innovators put their ideas into action!



THE INNOVATION PROJECT

Innovation Topic:

1. INQUIRY

After completing some research, describe who or what inspires you.

Is there an innovation that you would like to improve?

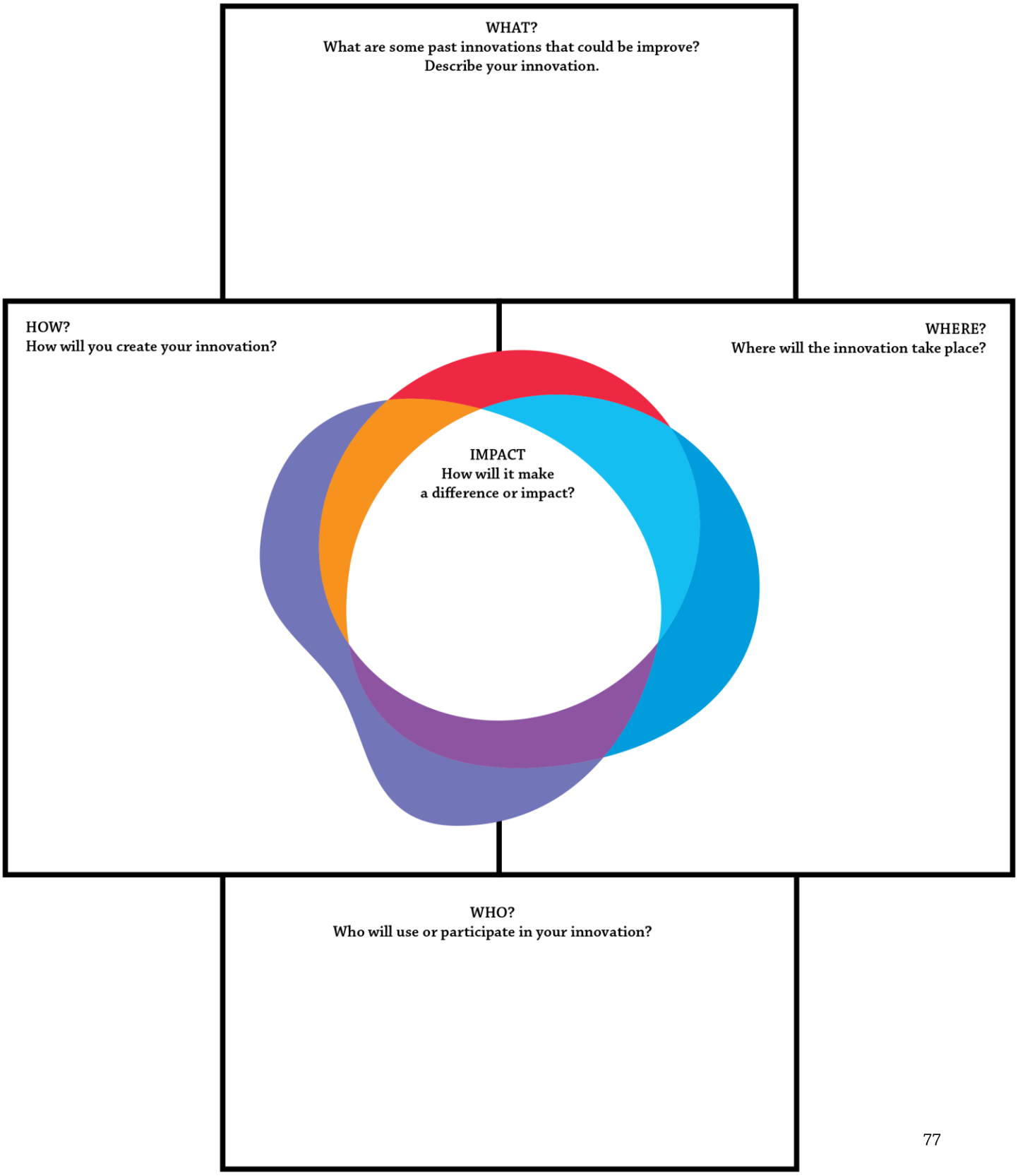
Investigate present issues. What is a current problem that needs to be addressed?

Imagine an innovation to address this need or issue. Provide a brief description?

What will be the potential impact of this innovation idea?

2. IDEATION

Part A: Begin narrowing your focus by brainstorming an innovation design. As you brainstorm, continue to think about the impact that you want your innovation to have.



Part B: Draw your innovation design. Include detailed labels about its features.

How will your innovation function?

What materials will you need?

Part C: Now that your group has brainstormed an idea for your innovation, continue the ideation process by developing a detailed plan. Use the following questions to guide an interactive discussion about some of the key considerations of the ideation phase. One group member can record your discussion points in the space provided.

Key Considerations

Who can you work with to develop your ideas? Can you partner with community organizations, businesses, peers, or experts?

How can you integrate other ideas? Does this innovation build from any other Canadian innovations?

How will you stay motivated? Will you create a schedule?

What impact do you want your innovation to have? What is the purpose of this innovation? Why is it necessary for Canada?

3. INCUBATION

After you have completed the design of your innovation and developed a prototype or action plan, it is time to test and improve your innovation. Incubate and test your ideas to determine if any improvements are necessary. Think about the innovation and ask others to give feedback to your group. Do you need to make changes or new versions and iterations?

After testing your innovation, what were some challenges you faced?

Consider the challenges you faced as well as your peer feedback. How can the innovation be improved?

After testing the innovation, determine if the innovation is having the intended impact?

4. IMPLEMENTATION

Before you can share your innovation, there are some important considerations your group must address.

What is your implementation plan for producing and promoting your innovation?
Consider the design, marketing, materials, budget, and schedule.

What roles will your team members have based on your plan for implementation?

Do you need investments or other resources?

How can you protect your intellectual property?

Have you considered using an advertisement to promote your innovation? Draw a sketch of your advertisement design, commercial, or storyboard.

What resources or ideas will you need?

How will you measure positive impact and success?

5. REFLECTION ON IMPACT

What were the goals of your innovation?

How did your group measure the impact or difference your innovation made in our world?

How can you improve your innovation even more in the future?

What are your next steps?

Group Assessment

Reflect on our innovation progress.

Rate your achievement related to the following statements:	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent
Knowledge and Understanding We research Canadian innovations to help us create our innovation idea.				
Thinking We work together to plan, create, test, and improve our innovation ideas.				
Communication We share our innovation with different audiences.				
Application We use the phases of the Innovation Cycle to create our innovation.				

How our group work can be improved:

Group Assessment

Assess the progress of our innovation.

Rate your achievement related to the following statements:	1 **Needs Improvement**	2 **Satisfactory**	3 **Good**	4 **Excellent**
Knowledge and Understanding Our innovation is based on research about current issues. Our innovation is based on research about Canadian innovations.				
Thinking We demonstrate critical thinking skills as we plan, test, and improve our innovation.				
Communication We communicate our innovation ideas in a persuasive and comprehensive manner.				
Application We are successfully applying the phases of the Innovation Cycle to the development of our innovation.				

Suggestions for further improvement in our group work:

Educator Assessment

Assessing learner progress and determining further improvements.

Area Being Assessed	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent
Knowledge and Understanding How does the group's innovation show evidence of research about current issues? How does the group's innovation show evidence of research on Canadian innovations?				
Thinking How does the group demonstrate critical thinking skills as they plan, test and improve their innovation? Is there evidence of problem-solving in their Innovation Project Package?				
Communication How does the group make use of the Innovation Package to communicate their ideas effectively?				
Application How does the group successfully apply the phases of the innovation cycle to the development of their innovation?				

Suggestions for further improvement:

Learning Experience 8

How is the Innovation Tested and Improved?

Background

In this activity, learners will be testing and improving their innovation. Just as Innovation Incubators are places for testing, improving, and growing new start-up innovations, this activity encourages learners to seek feedback and to use the feedback to make improved versions of their innovation. The presence and support of mentors and experts is useful in this Incubation Phase. Learners may wish to interview others about their innovation to gather perceptions about usage, cost, and target audience. Formal and informal data can be collected about the innovation to determine if it is meeting the intended goals and impact. The innovation can be included in experiments to assess its effectiveness under varied conditions and with a range of participants. Learners continue to inquire during this phase as they gain an understanding about the challenges and impediments they will face in the implementation phase. Improvements and iterations of innovations may be necessary to achieve the desired impact. The 'Innovation for Good' Declaration can be reviewed in this phase to determine if the impact of the innovation will be positive.

Learning Goals

- Demonstrate various methods of collecting meaningful data.
- Use and feedback to make informed decisions.
- Create a plan when faced with challenges and impediments.
- Work collaboratively to develop improvements and iterations.

Resources

- Sample of Innovation Testing - Innovation: Child-proof Match Container (Appendix 8A)
- Grades 1-6: Innovation Testing Template (Appendix 8B)
- Grades 4-8: Innovation Testing Template (Appendix 8C)
- Grades 1-6: Sample Interview Template (Appendix 8D)
- Grades 4-8: Sample Interview Template (Appendix 8E)
- Grades 1-6: Sample Survey Template (Appendix 8F)
- Grades 4-8: Sample Survey Template (Appendix 8G)
- Exit Ticket (Appendix 8H)
- Assessment Device (Appendix 8I)
- Canadian Inventor Tests Out His Omni Hoverboard prototype: https://goo.gl/SwECai
- Innovation for Good Declaration (Appendix IV)

Activating

- Watch the video: Canadian Inventor Tests Out His Omni Hoverboard and ask learners why it is important for inventors to test their innovations?
- Discuss the importance of testing a product before it goes to the market. In this step, learners will develop awareness that innovation plans need to be improved continually and that trial and error are

part of the process. They will conduct appropriate testing and record their results to develop a plan to make improvements to their innovation.

- Share the Sample of Innovation Testing - Innovation: Child-proof Match Container (Appendix 8A).
- Brainstorm ways of testing innovations (record responses on chart paper or whiteboard for learners to reference).

Acquiring and Applying

- Request that learners decide on the types of testing they will do with their innovations. (Ask learners to determine what kind of data they will collect and the method).
- Allow learners time to develop a survey or interview questions tailored to their needs. (Sample survey and interview questions: Appendix 8D, 8G.)
- The survey or interviews can be done electronically or in person. Learners may wish to interview school personnel, community partners, parents, or siblings depending on the audience and purpose of their innovation.
- Allow time for learners to develop experiments and test innovation using sample from Appendix 8A and 8B.
- Show learners how to use programs such as Excel to collect and summarize the data.
- Encourage learners to review the 'Innovation for Good' document and determine if their innovation process and product will make a positive impact

Consolidation and Conclusion

- Ask learners to complete the Exit Ticket (Appendix 8H).
- Instruct learners to submit a summary of the data collected, findings and recommendations using the Innovation Testing Template (Appendix 8B or 8C). Learners should indicate the changes they will make to their innovation.

Assessment

Strategy: Testing (8B, 8C), Interview (8D, 8E) and Survey (8F, 8G) Activity Sheets, Exit Ticket (8H)
Tool: Rating Scale (8I)

The exit ticket can be used to assess learner progress.

Sample of Testing Innovation: The Child-proof Match Container

Question/Issue

Why are so many children getting burned from matches?
How can containers for matches be safer and childproof?

Hypothesis

If we can make a child-proof container for matches, then the matches cannot be ignited by anyone under the age of 13.

Materials

Prototype: childproof container with matches inside (this will be a pill bottle with childproof lid with matches inside and the striking surface under the lid).

Participants

To determine whether our innovation is successful, we will need to conduct a test (experiment). The test will include: 100 children between the ages of 3 and 13 with 10 children of each age.

Experiment/Procedure

First, organize the children by age into groups of 10.
Next, instruct the children to try their very best to open the match container within 10 minutes.
Take notes on how the children attempted to open the container. Who was successful?

Findings

It was found that children under the age of 10 had a significantly harder time opening the container than those aged 10, 11, 12, and 13.
85% of the children under 10 could not open the container
90% of the children 10 and older could open the container, with 50% doing so within the first 5 minutes

Conclusion/Future Research

Clearly this innovation is successful for children under the age of 10. It would be interesting for future experiments to be done to see how some children under the age of 10 could open the container, and how the innovation could be improved to allow for less access by all children under the age of 10.
For this product to be effective for children 10+, future research will need to examine why the children aged 10 to 13 were able to open the box. This can be done through follow-up interviews and replications of the experiment with the participants and could possibly lead to further research.

Innovation Testing

Name of Innovation	
Ask a Question	
Make a Prediction 	
Make a Testing Plan and Follow it 	
Observe 	
Record the Results 	
Draw a Conclusion 	

Innovation Testing

Name of Innovation:

Question/Issue:

Why is the experiment necessary?

What issues does the innovation address?

What are the research questions?

Hypothesis:

Use **If/Then** statement to predict what the experiment will prove/disprove:

Materials:

What materials will the experiment require?

Participants:

Who will be involved in the experiment? Be specific.

Experiment/Procedure

How will the experiment be conducted? Write down a thorough list of the steps taken.

Findings:

What were the results of the experiment? List the observations and discoveries in detail.

Conclusions/Future Research:

What inferences can be drawn from the findings? How can the findings be explained? Are there other experiments that can extend or replicate the research?

Interview Template

Use the questions below to interview your peers. What do people think about your innovation? Use this information to help improve your innovation.

1. What are two things that you liked about our innovation?
I liked:

I liked:

2. What is one way that we could improve our innovation?
I would:

3. Would you use this innovation? Explain why or why not.

4. How will this innovation make a difference or impact?

Interview Template

Use the questions below to interview your peers. What do people think about your innovation?

1. What are some positive features of the innovation?

2. If one feature of the innovation could be changed, what would it be? Why?

3. How could this innovation be useful in the world?

4. How will this innovation make a difference or impact?

5. What are any potential drawbacks or negative impacts for the innovation? If so, how can they be avoided?

Innovation Survey

Answer the following questions by shading in your answer. Explain your answers in the space provided below.

Question	Yes	No
Do you like our innovation?		
Would you use our innovation?		
Is our innovation useful?		
Would you buy our innovation?		

Draw a picture of how you think we could improve our innovation. Explain your suggestions in the space provided.

Innovation Survey

Answer the following questions by circling yes or no. Explain your answers on the space provided below.

1. Are you familiar with a similar innovation? No Yes
   a. If yes, please specify:

_____

_____

2. Will this innovation be impactful? No Yes
   a. Specify why or why not:

_____

_____

3. Will this innovation be well received? No Yes
   a. Specify why or why not:

_____

_____

Please rate the following:

This innovation…	1 **Needs Improvement**	2 **Satisfactory**	3 **Good**	4 **Excellent**
is creative and collaborative				
will improve people's lives				
is realistic				
addresses a real-world issue				
has the potential for further opportunities/progress				
is well thought-out				

EXIT TICKET

Name: _____

The thing that surprised me about testing my innovation is...

_____

_____

One thing I am confused about is . . .

_____

_____

Today's lesson on testing my innovation helped me to understand . . .

_____

_____

_____

_____

EXIT TICKET

Name: _____

The thing that surprised me about testing my innovation is...

_____

_____

One thing I am confused about is . . .

_____

_____

Today's lesson on testing my innovation helped me to understand . . .

_____

_____

_____

_____

Innovation Test and Improvements: Assessment

Check for understanding. How do the groups:

- Demonstrate various means of collecting meaningful data;
- Use data and feedback to make informed decisions;
- Create a plan when faced with challenges and impediments.

Names	1 Needs Improvement	2 Satisfactory	3 Good	4 Excellent

Learning Experience 9

How is the Innovation Implemented?

Background

This learning experience may take a number of class periods, as the learners will need time to complete the various aspects of the Innovation Project. The learners will be asked to assume various roles to complete each section. Learners may work collaboratively to determine next steps such as the cost of implementing the innovation, the communication or marketing plan, and how to determine impact for continuous improvement. Some tasks could have a team leader with others contributing to the team efforts. Young learners (Grades 1-6) may use the Innovation Project Plan provided in Activity 7 (Appendix 7A) as the implementation plan, whereas older learners (Grades 4-8) may be required to complete the Innovation Project Plan provided in Activity 9 (Appendix 9A). The Innovation Project Plan also includes some tasks related to the preparation of the Innovation Celebration. Each Innovation Team will need to prepare a visual and verbal presentation using a range of multimodal approaches.

Learning Goals

- Demonstrate organizational and cooperation skills to complete a project.
- Present new understandings and ideas for innovation.
- Apply technology to develop effective presentations.
- Apply mathematical skills to complete an implementation plan.
- Apply leadership skills to ensure task completion.

Resources

- Innovation Space materials to complete the innovation and develop a presentation
- PowerPoint or access to the internet for a Prezi presentation
- Grades 4-8: Innovation Project Plan (Appendix 9A)
- Grades 1-6: Innovation Presentation Checklist (Appendix 9B)
- Grades 4-8: Innovation Presentation Checklist (Appendix 9C)
- Grades 4-8: Innovation Project Plan Self Checklist (Appendix 9D)
- Grades 4-8: Innovation Project Plan Peer Checklist (Appendix 9E)

Activating

- Ask learners how a project moves into completion. Some learners may refer to the example of a new building such as a school, store, or home in their neighbourhood. Brainstorm the steps, resources and roles involved in such projects. Other projects that could be examined are a Fundraising Carnival or a Buddy Bench in the school yard.
- Ask learners to reflect on aspects of projects and products such as a name, logo, cost and advertising. An innovation such as a goalie mask or an organization example of “Me to We” could be analyzed for how it has changed over time.

Acquiring and Applying

- Learners should now have accumulated significant planning resources in their Innovation Project Portfolio. Using their plans, they can begin to apply their ideas to their Project Plan (Appendix 9A). This plan focuses on the necessary budgeting and marketing involved in the development of an innovation, while providing educators with an opportunity to make cross-curricular connections to mathematics.
- Allow learners considerable time to complete their Innovation Implementation Plan and to finalize their innovations.
- Ensure each team's Innovation Project Plan includes a budget and required resources.
- Provide learners with time to prepare and develop a presentation to be shared at the Innovation Celebration. This presentation can be completed digitally or in the form of a poster. It should also follow the requirements of the rubric provided in the Innovation Project Portfolio (Appendix 6A).
- Encourage learners to prepare a script for the presentation to help communicate their innovation ideas and plan with others.

Consolidation and Conclusion

- Ask learners to practice their presentations in small groups or to select audiences such as another class.
- Videotape learners when they present so they may view the video and improve their presentation style.

Assessment

Strategy: Implementation Plan Activity Sheets (9A), Innovation Presentation Activity Sheets (9B, 9C)
Tool: Innovation Presentation Checklist (9B, 9C), Innovation Project Rubric (9D, 9E)

Learners can complete self- and peer assessments to ensure they have successfully completed their Innovation Project Plan.

The Innovation Project Plan

The questions provided in this package are intended to develop an Implementation Plan for the Innovation Project.

Innovation Title: _____

Group Members: _____

_____

_____

What is an Innovation Project Plan?
An Innovation Project Plan includes goals and objectives of the innovation and describes what will be achieved over a specific period of time. The implementation plan should include:

- What product or service the innovation will provide;
- How the product or service will gain customers or clients;
- How the innovation will operate, where it will be located;
- The start-up costs, expenses, profits and expected impact;
- The risks, challenges or ethical considerations associated with the innovation and the plan to manage them.

Why develop an Innovation Project Plan?
The Innovation Implementation Plan allows innovators to think about their products, customers, competition, marketing and financing to ensure that the innovation can be put into action.

Developing an Innovation Implementation Plan

I. Summary of Innovation Idea

Briefly describe:

- What the innovation will do; what is the product or service?
- Where the innovation will be located, the potential start dates and the hours of operation?
- What makes the product or service unique and appealing?
- The market you will serve and your customer/client/user profile.
- Any advantages over the competition or similar service providers?
- The start-up costs, projected sales and project profit or impact.

_____

_____

_____

_____

_____

II. Product/Service:

Briefly describe the product or the service:

- How will the product or process be made? How will service be implemented?
- What are the processes and the costs?
- What are the materials needed and who will be the suppliers?
- What are the innovative features of the product and/or service that make it unique? How is the business or service different from others in the industry?
- What features or advantages will entice customers/clients to buy or use the service (convenience, guarantees, etc.)?
- How are competitors or similar providers handled?

III. Marketing Plan

Describe customers, clients and pricing to estimate daily sales and calculate weekly sales revenue:

Customer/Clients

- What are the characteristics of your ideal customer or client?
- How many people are in the target area?

Cost and Price

- What will be the cost for the product or service? How was this cost calculated?

- Is the service funded as a social innovation? How is this money or support attained?
- Take into consideration such costs as supplies, overhead, labour, rent and other expenses. Remember to also consider what the competitors charge.

Estimated Sales

- How many units of the product can be sold in a week?
- If the innovation is a service, how many jobs or clients can be booked each week, or how many projects can be completed?

IV. Advertising and Other Promotion of the Innovation

Briefly describe:

- How will the product or service be advertised or communicated? Include the type of advertising that will be used, for example: direct mail, Internet, radio, television, etc. How much will it cost? How much business or how many clients will it bring in?
- Describe plans you have to generate media attention for the innovation. Which media will be targeted?
- What kinds of marketing materials will be used? Consider brochures business cards, posters, etc.
- Will a website be created? If so, describe how it will be used to market the innovation.
- What other forms of marketing will be used? Consider tradeshows, telemarketing, cold calling, Instagram, Twitter, other social media?
- What will this advertising and other promotion cost?

V. Budget

List in detail the budget that will be required to build, start and operate your innovation.
Some sample costs are materials, advertising, licenses, business registration, bank charges, insurance, equipment, advertising, inventory, office supplies, and potential employees. Some costs are one-time costs and others are ongoing operational costs.

Sample Sales Projection Table:

Item	Price Per Item	Number of Item Sold Per Day	Number of Item Sold Per Week

Sample Cash Flow Table:

Source	Amount ($)
Revenue from sales or other sources	
Expenses (materials, advertising, equipment, bank fees, insurance)	
Net Cash and Net Profits.	
Total:	

Innovation Presentation Checklist

Use this checklist to help organize your innovation presentation. Use your Innovation Portfolio materials and include only the most important details in your presentation. Remember you want to convince your audience that your innovation is great!

Group Members: _____

Innovation Title: _____

1. Tell the audience about your Innovation.

- What is your innovation?
- What is it called?
- Does it have a logo or slogan?
- What were you trying to improve? OR What problem were you trying to solve?

2. How did you create this innovation?

- What ideas did you think about?
- Why did you choose this design?
- What materials did you use to create your innovation?
- Who is going to help you create the innovation?

3. How did you test and improve your innovation?

- How did you test your design?
- What were some problems you had with your design?
- How did you fix the problems?

4. How will you share your innovation with others?

- How are you going to share your innovation with others?
- Who will help you share your innovation?
- Who is going to help you pay for producing the innovation?

5. What is the impact of your innovation?

- How will your innovation help the world?
- How does your innovation address ethical considerations like the environment?
- Do you think your innovation can become even better in the future?
- How do you think it could improve?

Innovation Presentation Checklist

Use this checklist to structure your presentation on your innovation. Refer to your Innovation Portfolio and include only the most important points. Be sure to write and speak in a way that will convince the audience that this is a great innovation!

Group Members:

Innovation Title:

1. Introduce your Innovation.

- What is your innovation?
- What is it called?
- Does it have a logo or slogan?
- What issue, challenge or problem does it address?

2. How did you develop this innovation?

- What ideas did you consider?
- Why did you decide on this design?
- What materials or resources did you use to develop your innovation?
- Who was involved with the creation?

3. How did you test and improve your innovation?

- How did you test your design?
- What were some challenges you had with your design?
- What steps did you take to improve it?

4. How will you communicate and market your innovation?

- How do you plan to let the public know about your innovation?
- Who is helping you with your innovation?
- What support do you need for this (e.g., materials, money, etc.)?

5. What is the planned impact of your innovation?

- How will your innovation help the world?
- Which aspect of society can it help (e.g., the people, the forest, the ocean, the economy, the arts, social issues)?
- Do you think your innovation can be further improved in the future? If it can be improved, suggest possible improvements.

Innovation Project Plan Self Checklist

Use the following checklist to determine if your group has adequately addressed each area of the Project Plan. Provide any necessary feedback or comments in the space provided.

Innovation Being Reviewed: _____

Area	No	Yes	Feedback/Comments
Summary of Innovation Idea Did we address what product or service the innovation will provide?			
Product/Service Did we address how the product or service will gain customers or clients?			
Marketing Plan Did we address how the innovation will operate, where it will be located and what geographic regions it will serve?			
Advertising and Other Promotion Did we address the start-up costs, expenses, sales forecast, expected profits and expected impact?			
Budget Did we address the start-up costs, projected sales and project profit or impact?			

Innovation Project Plan Peer Checklist

Use the following checklist to provide peer feedback for the group's innovation idea. Have they adequately addressed each area of the Implementation Plan? Provide any necessary feedback or comments in the space provided.

Innovation Being Reviewed: _____

Area	No	Yes	Feedback/Comments
Summary of Innovation Idea Did the group address what product or service the innovation will provide?			
Product/Service Did the group address how the product or service will gain customers or clients?			
Marketing Plan Did the group address how the innovation will operate, where it will be located and what geographic regions it will serve?			
Advertising and Other Promotion Did the group address the start-up costs, expenses, sales forecast, expected profits and expected impact?			
Budget Did the group address the start-up costs, projected sales and profit or impact?			

Learning Experience 10

What is an Innovation Celebration?

Background

An Innovation Celebration can showcase interesting Innovation Projects developed by learners from Kindergarten through to Grade 12. Any age group can be involved and the Innovation Projects could be presented at various stages of development and completion. Some Innovation Projects may be presented by individuals, small groups or whole classes. The Innovation Celebration is ideally non-competitive and includes all learners. The Innovation Projects of learners serve to acknowledge past Canadian innovations, and most importantly, share and celebrate future innovations. The Innovation Celebration can be held in a classroom, school gymnasium, community centre, or shared virtually. It can be a school-wide or district initiative, with input from parents and community partners.

The initial organizing steps involve determining logistics of the celebration such as place, space, time, and duration, size and supplies, as well the possible need for a planning committee. The following guidelines will be presented as a series of activities that could be undertaken as an educational celebration for the school or community.

There may be an opportunity for learners to share their Innovation Projects in an event to be held during Canada's National Innovation Week.

Learning Goals

- Apply planning, organizational and presentation skills for an authentic purpose.
- Demonstrate an understanding of the concept of innovation, as well as the phases and aspects of the Innovation Cycle.
- Demonstrate knowledge of past Canadian innovations and how they affect present and future innovations.
- Present Innovation Projects describing features such as the impact, costs, marketing, etc.
- Participate with peers, parents and community partners to celebrate Canadian culture of innovation.

Resources

- Task List for an Innovation Celebration (Appendix 10A)
- Sample Invitation for an Innovation Celebration (Appendix 10B)

Suggested Activities/Tasks

There are various ways to organize an Innovation Celebration. Each event is different because committee members may add new, innovative ideas unique to their celebration. Some possibilities for presentations of Innovation Projects are:

- Poster boards or tri-fold boards
- Slideshows or videos
- Working models of Innovations
- Essays or proposals about social innovations

- Classroom or community room visits
- Oral presentations about innovations (especially if learners are not able to physically build a model of their idea)
- Accommodations for other special needs

Learners are a diverse group of people, who learn in many different ways. To ensure that all learners have an equitable chance of participating and taking an interest in innovation, it is important to incorporate diversity and multiliteracies into the planning of the Innovation Celebration.

Another consideration for organizing the celebration is to determine how to involve parents, school peers and community members in the planning. Some suggestions are:

- Invite guests to the Innovation Celebration event.
- Live or recorded streaming of Innovation Projects online.
- Recorded presentations or videos on class website.

Assessment

Strategy: Innovation Celebration Presentation
Tool: Innovation Project Rubric (6B)

Educators can use Appendix 6B to assess learner understanding and application of the Innovation Cycle. This assessment is in the form of a rubric and can be used as either a group or individual assessment. This assessment should be cumulative and consider aspects of the planning, testing and implementation process along with the presentations at the Innovation Celebration.

Task List for an Innovation Celebration

	Questions	Notes	Timeline
Who: Participants and Audience	Who will participate in the Celebration? Will there be learners from one class or many classes? Who will participate in organizing the event? Who will be responsible for contacting different local participants? Who will view or visit the Celebration?	Involving different grades in the Celebration will allow for a greater diversity of projects presented. Also, having a variety of partners in the planning committee will reduce the responsibilities of each role.	Determine timelines, tasks, roles, and deliverables for the organizing committee (e.g., How long will the Innovation Celebration be displayed or presented)?
What: Content and Materials	What type of innovations will the learners present? What materials do learners need for their presentations? What types of community connections will be made? How do these connections relate to the innovation aspects?	Consider the technological components that learners will require. What materials and resources will the learners need to successfully conduct an Innovation Celebration?	Innovation Projects need sufficient time to be planned and organized. How will they share their information?
Where: Location	Where will the celebration take place? Will it take place in a classroom or will it require a larger space such as gymnasium or library? Where will the celebration take place? Will it take place in a classroom or will it require a larger space such as gymnasium? Where is the access to lighting control (for slide shows) and electrical outlets? Where can tables be set up?	Some projects (such as slideshows or videos) may require reduced lighting. Other projects may require a presentation space such as oral presentations or working models of innovations.	Talk to administration with enough time before the event and consult with caretaking staff to determine the best location and any incidentals required.
When: Timing	When will the event take place? Will it take place during school/business hours or after, or both? What is the best plan for timing to accommodate the audience?	Consider the needs of the community as well as guests when planning the timing of the event. Consider a virtual event if there are time and space constrictions. How will a virtual event be shared? On a website? Is privacy an issue?	Consider timing when deciding location. Arrange to have caretaking staff available as needed

Innovation Celebration!

Dear Guest,

You are invited to visit our Innovation Celebration!

We are excited to share our Innovation Projects with our visitors. We have worked very hard to research Canadian innovations and to develop our own innovations. Come and see the next generation of Canadian Innovators!

Date: _____

Time: _____

School: _____

Address: _____

Grades: _____

If you cannot attend, don't worry! We will be posting video and photos of our innovations on our class website. You can have a virtual tour of our Innovation Celebration!

Thank you for your interest and support!

Resources & References

Print

Ingenious: How Canadian Innovators made the World Smarter, Smaller, Kinder, Safer, Healthier, Wealthier and Happier (2017) by His Excellency Governor General David Johnston and Tom Jenkins

Innovation Nation: How Canadian Innovators made the World Smarter, Smaller, Kinder, Safer, Healthier, Wealthier and Happier (2017) by His Excellency Governor General David Johnston and Tom Jenkins

Creating Innovators: The Making of Young People Who Will Change the World (2015) by Tony Wagner

Drive: The Surprising Truth About What Motivates Us (2011) by Daniel H. Pink

Empower: What Happens When Students Own Their Learning (2017) by John Spencer and A.J. Juliani

Inquiry and Innovation in the Classroom: Using 20% Time, Genius Hour, and PBL to Drive Student Success (2014) by A.J. Juliani

Invent to Learn: Making, Tinkering and Engineering in the Classroom (2013) by Sylvia Libow Martinez and Gary Stager

Launch: Using Design Thinking to Boost Creativity and Bring Out the Maker in Every Student (2016) by John Spence and A.J. Juliani

Pure Genius: Building a Culture of Innovation and Taking 20% Time to the Next Level (2014) by Don Wettrick

Shift This: How to Implement Gradual Changes for MASSIVE Impact in Your Classroom (2017) by Joy Kirr

Sparking Student Creativity: Practical Ways to Promote Innovative Thinking and Problem Solving (2014) by Patti Drapeau
The Genius Hour Guidebook: Fostering, Passion, Wonder, and Inquiry in the Classroom (2015) by Denise Krebs, Gallit Zvi (this has lessons)

The Idea of Canada: Letters to a Nation *(2016) by David Johnston*

The Innovator's Mindset (2015) by George Couros

The 20Time Project: How educators can launch Google's formula for future-ready innovation (2015) by Kevin Brookhouser

Your Start Guide to Makerspaces (2016) by Nicholas Provenzano

Value Proposition Design: How to Create Products and Services by Alexander Osterwalder, Yves Pigneur, Gregory Bernarda

Pullan, M., & Langworthy, M. (2014). A Rich Seam: How New Pedagogies Find Deep Learning. London, UK: Pearson.

Ontario Ministry of Education (OME). (2015). 21st Century Competencies: Towards Defining 21st Century Competencies for Ontario. Toronto, ON: Queen's Printer for Ontario.

Pellegrino, J.W., & Hilton, M.L. (Eds.). (2012). Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. National Research Council. Committee on Defining Deeper Learning and 21st Century Skills, Board on Testing and Assessment and Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Schleicher, A (2018), World Class: How to Build a 2F Century School System, Strong Performers and Successful Reformers in Education. Paris, France: OECD Publishing. Retrieved from http://www.oecd.org/education/world-class-9789264300002-en.htm

Trilling, B., & Fadel, C. (2009). 21st Century Skills: Learning for Life in Our Times. San Francisco, CA: Jossey-Bass.

Websites

20 Time: http://www.20time.org

Canada 150: http://canada.pch.gc.ca/eng/1469537603125

Canada A Nation of Innovators: https://www.ic.gc.ca/eic/site/062.nsf/vwapj/InnovationNation_Report-EN.pdf/$file/InnovationNation_Report-EN.pdf

Canadian Foundation for Innovation: https://www.innovation.ca

Canadian Innovation Exchange: http://canadianinnovationexchange.com/2017/

Dictionary of Canadian Biography: http://www.biographi.ca/en/

Genius Hour: http://www.geniushour.com

Google Innovation : http://www.ctvnews.ca/sci-tech/10-canadian-finalists-named-in-google-s-5m-innovation-challenge-1.331831

Governor General's Office: https://www.gg.ca/index.aspx

Historica Website: http://www.thecanadianencyclopedia.ca/en/learningcentre/for-educators/

Canadian Innovation Space: https://canadianinnovationspace.ca/

Innovation Culture Canada : www.https://canadianinnovationspace.ca/

Organization for Economic Cooperation and Development (OECD): http://www.oecd.org/fr/innovation/innovating-education-and-educating-for-innovation-9789264265097-en.htm.

TVO: http://tvo.org/education

Innovation Videos

Canada: A Nation of Innovators
www.youtube.com/watch?v=AI-4OT4h_JY

How Do Innovators Innovate?" E4I Video
https://canadianinnovationspace.ca/resources/what-exactly-is-innovation/

Implementation of Education for Innovation at John Sweeney School
https://canadianinnovationspace.ca/resources/

Investigate! Invent! Innovate! Program
https://www.youtube.com/watch?v=BrAegnt4IG0&feature=youtu.be

Ingenious & Innovation Nation Videos

Smarter

Radio **1927 Edward Rogers Sr. developed first commercially viable all-electric radio in Toronto:** *https://www.youtube.com/watch?v=tqJQPFrcV6c*

Smaller

Dog Sled ***Far & Wide - Meet The Inuit Sled Dogs Of Nunavut*:**
https://www.youtube.com/watch?v=cyzu3459uYE
Snowshoes of the Cree Nation of Chisasibi:
https://www.youtube.com/watch?v=3FO88yMvC8g

Kinder

Wheelchair **Brooke Nevin Teachers Canada Something About the Electric Wheelchair**:
https://www.youtube.com/watch?v=Agza6sPfqKo
Blue Box Recycling ***Nyle Green Bin:***
https://www.youtube.com/watch?v=V4NKWJB-pIc
How to build an Igloo- **A Boy Among Polar Bears:**
https://www.youtube.com/watch?v=R-x5QOSqP3E
Blue Box Recycling – **What Happens to Your Recycling in Waterloo Region:**
https://www.youtube.com/watch?v=u3w-UTrdE50

Safer

Igloos- ***How an Igloo Keeps You Warm*:**
https://www.youtube.com/watch?v=1L7EI0vKVuU

Healthier

Insulin - **Dr. Fredrick Grant Banting Canadian Medical Hall of Fame 1994:**
https://www.youtube.com/watch?v=WnME08SiJ0k

Wealthier

Trivial Pursuit- **How to Play Trivial Pursuit:** https://www.youtube.com/watch?v=w4LEGSYwk-0

Happier

Superman – **Is Superman Part of Canadian?**
https://www.youtube.com/watch?v=daj2nwvefTA
Superman – **Superman Historica Minutes:** https://www.youtube.com/watch?v=XO9Pe7UnHr0

Glossary

- **Ideation**: The phase of innovation where ideas are developed and innovations are created.
- **Imagination**: To creatively dream of new ideas or images before putting them into action.
- **Impact**: The potential effect made by an action, process or thing that makes a difference or addresses a problem or issue.
- **Impediment**: An obstacle or challenge that might present itself during the innovation process.
- **Implementation**: The phase of innovation where innovators develop a plan addressing how they will put their innovation into action and share it with others.
- **Improvement**: To adjust or make something better. An improvement can be adding onto an idea or innovation, or it can be fixing an impediment or issue.
- **Incorporation**: The act of registering an innovation as a business or social enterprise.
- **Incubation**: The phase of innovation where innovators test, improve, grow and assess the progress of their innovation.
- **Initiative**: Taking the responsibility to be proactive and work on a task independently.
- **Innovation Celebration**: An Innovation Celebration is an event that showcases the accomplishment of multiple innovations. It provides learner-innovators with an opportunity to share their ideas, prototypes and achievements. An Innovation Celebration can be held in a classroom, community centre or online through a virtual platform. They can be presented amongst innovators or shared with the public.
- **Innovation Space**: An Innovation Space is be a designated area that provides learners with a temporary or permanent location to examine, develop, make or create innovations on an ongoing basis. Educators can designate a location for the Innovation Space in the learning environment and provide interesting and relevant materials. Learners can contribute to the Innovation Space by adding additional artifacts from home or examples from media resources. An Innovation Space can also be a place to display Canadian innovations and learner-created Innovation Projects at various stages of completion. An Innovation Space may also be a designated virtual platform for content management and discussions.
  Some materials that educators may want to include in an Innovation Space are:
  - Canadian innovation examples (innovations can be diverse or grouped to represent a topic)
  - Samples of books about innovation (e.g. *Innovation Nation*, *Ingenious*)
  - Technology: tablet or laptop, QR Code Scanners, printer, 3D Printer, virtual reality viewers, digital cameras, magnifying glass, microscope
  - Recycled materials: wrapping paper, wallpaper, plastic containers and lids, paper rolls, twist ties, string pieces, Styrofoam, wooden pieces, popsicle sticks, straws, egg cartons
  - Art supplies: glue, paper clips, pieces of Velcro, tape, string, elastic bands, paper, clipboards, post-it notes, cards, small white boards or chalkboards, markers, pencils, pens, crayons, pencil crayons, paint, bingo dabbers
  - Building materials: marbles, discs, wheels of varying sizes, toothpicks, tubes, plasticine or play dough, pompoms, beads, bells, drums
  - Natural materials: twigs, rocks/stones, shells, feathers

- **Innovation**: Innovation is the creation or improvement of a process or product to make an impact.
- **Inquiry**: The phase of innovation where innovators research existing innovations, problems, or issues.
- **Inspiration**: To be influenced to do something creative.
- **Integration**: To bring people and various ideas together.
- **Intellectual property**: An innovation that is the product of one's creativity or design and is owned by the innovator(s).
- **Interaction**: To work with others collaboratively.
- **Invention**: An invention is the creation of a new item or device.
- **Investigation**: To inquiry about something or someone in order to learn more.
- **Investment**: The act or process of investing money into the production of an innovation.
- **Iteration**: To repeat an action or process to make a new version.
- **Prototype**: A beginning model of an innovation or design that is used as an example for subsequent models.
- **QR Technology**: A Quick Response code is a type of barcode that, when scanned by apps such as QR Scanner (found in the Appstore or on Google Play), directs users to webpages or additional links providing particular information. QR Codes can be created for free through various online QR platforms.
- **Start-up**: The action or process of setting a business, innovation or product in motion.

Innovation for Good

Innovators will be:

1. Trusting and respectful:
   Build trust and mutual respect among innovators and consumers
2. Transparent and provide choices:
   Be consistently honest and give consumer options
3. Aware of work-related implications:
   Consider the effects on jobs and careers
4. Diverse and Inclusive:
   Recognize biases, make accommodations and ensure equitable access
5. Mindful of impacts on people and the environment:
   Predict and mitigate potential negative impacts
6. Proactive and collaborative:
   Work with stakeholders and policymakers

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CANADIAN INNOVATION SPACE
INNOVAZONE CANADIENNE

Adapted from the Tech For Good Declaration, a set of guiding principles that all aspiring organizations can follow to create and use technology for the good of humanity.


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