



EDUCATION FOR INNOVATION

Early Learning – Kindergarten



A Resource Guide

CanadianInnovationSpace.ca



Fondation
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Foundation

CANADIAN
INNOVATION
SPACE
INNOVAZONE



Welcome to

EDUCATION FOR INNOVATION (E4I) AT HOME

EVERYONE CAN BE AN INNOVATOR,
including Kindergarten students!

The following lessons are adaptations from the Education For Innovation (E4I) Early Learning-Kindergarten Resource that you can try with your child at home. The lessons were developed by faculty and teachers and align with curriculum requirements.

Note: To download the complete Education For Innovation (E4I) Early Learning-Kindergarten resource, please visit:

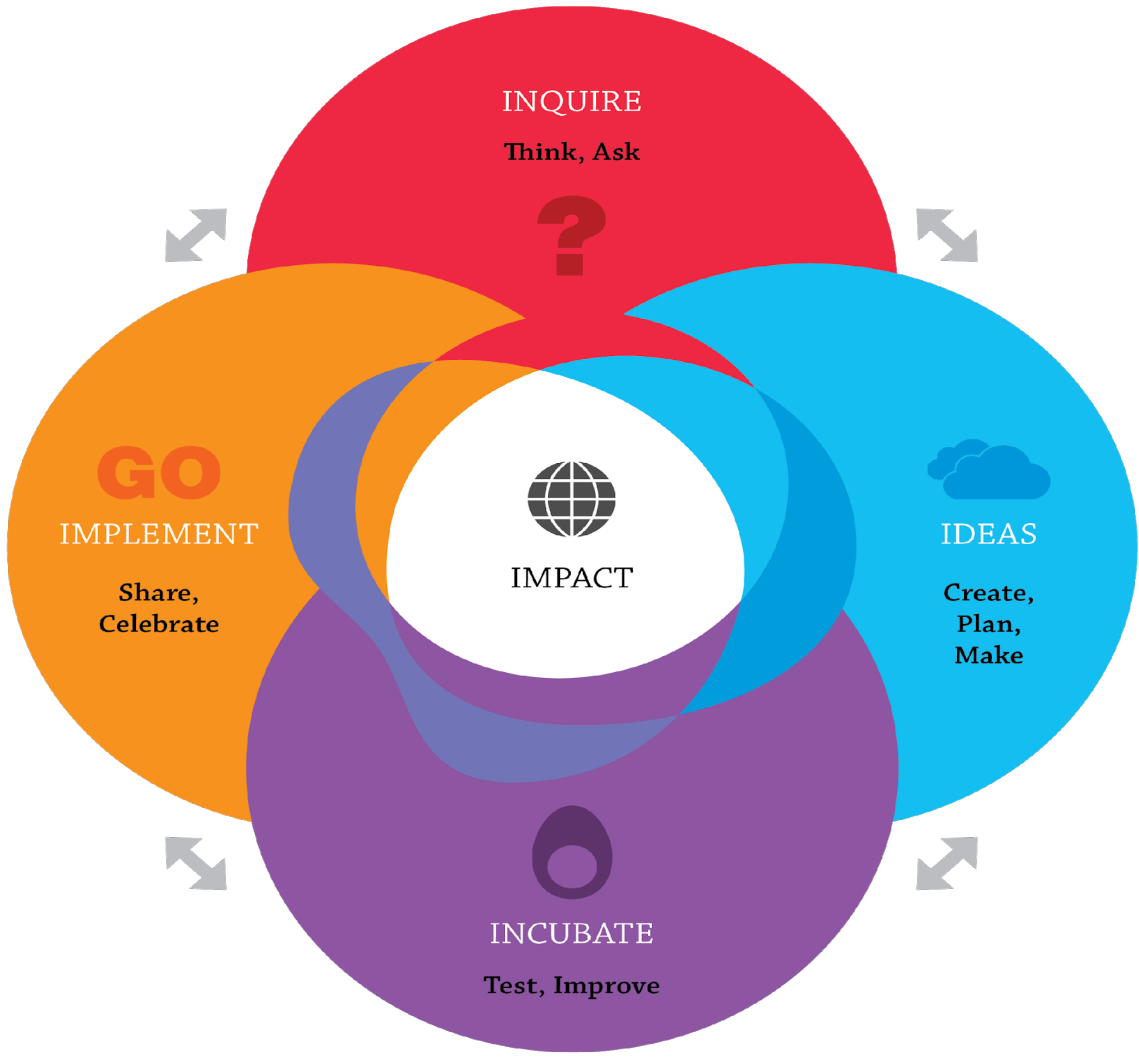
<https://canadianinnovationspace.ca/resources/>

LET'S GET STARTED!

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First you need to know what innovators do.
See the Innovation Cycle below to learn how innovators think.



Innovators:

Ask/Think
INQUIRE

Plan/Create
IDEATE

Test/Improve
INCUBATE

Share/Celebrate
IMPLEMENT

Give your child a notebook or paper to start jotting or drawing down his/her questions, ideas and plans!



So, what exactly is innovation?

The definition which can be used with young children is below:

Innovation is creating or improving a thing (product) or action (process) to make a difference (impact).

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

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

Watch these videos to learn more:

- **Video:** What is Innovation?
<https://canadianinnovationspace.ca/resources/what-exactly-is-innovation/>
- **Video:** Education for Innovation - TEDxKitchenerED:
https://www.ted.com/talks/dr_maria_cantalini_williams_education_for_innovation
<https://www.youtube.com/watch?v=zq5K8cELETI>

Now that you know what an innovation is, let's get started on your child's innovation journey...

Learning Experience 1: What is Innovation?

Watch: “Rosie Revere, Engineer” by Andrea Beaty:

<https://www.youtube.com/watch?v=3sNVhNThxcc>

Rosie may seem quiet during the day, but at night she's a brilliant innovator of gizmos and gadgets who dreams of becoming a great engineer.

Think: Have you tried to create anything? Why did you decide to create it? What did it do? Did you have to fix it after you tried it?

Talk it out:

1. Why did Rosie make her creations? (INQUIRE)
2. What were some of her ideas? (IDEAS)
3. What did Great-great Aunt Rose give Rosie to help her continue innovating? What materials did Rosie use to create the cheese helicopter? (PLAN)
4. What happened when Rosie tested the cheese helicopter for her Aunt Rose? (TEST)
5. What did Aunt Rose say to Rosie when her innovation crashed? (SHARE)

Compare your answers to those in the answer box:

Answers:

1. Rosie was inquiring how she could help people in her life.
2. A hot dog dispenser, helium pants, a cheese spray hat, and helio-cheese-copter.
3. A notebook for making plans.
4. It floated a moment then crashed to the ground.
5. "Your brilliant first flop was a raging success! Come on, let's get busy and on to the next!"

Note: Rosie Revere's creations are innovations because: her creations have a specific purpose; there is a reason why she creates them; she uses her imagination to design a gadget that is supposed to solve a problem and make something better; she continues to improve her creations until they work just right!

Remember: *Innovations are not only objects. They could be new ways of doing things such as a new home routine (bedtime / snack) or a new way or organize toys!*

Ask: Could innovate some areas in your home or some routines? Any problems that need solving? Any gadgets at home that could be better?

Remember: *Children are innovators too, just like Rosie! Rosie Revere is an innovator who uses her imagination to come up with different ideas, and create many interesting and helpful things. What might you create today? Now you are inquiring! Great job, innovators!*

What Do Innovators Do?



Excerpt from the Ontario Ministry of Education Kindergarten Program, 2016.

Learning Experience 2: What is an Innovation Space?

You may not have an attic like Rosie, but you could find a corner of your home to set up your own **Innovation Space**.



Here are some materials you could gather up for your Innovation Space:

- **Recycled materials:** wrapping paper, wallpaper, plastic containers and lids, paper rolls, twist ties, string pieces, Styrofoam, wooden pieces, popsicle sticks, straws, egg cartons, empty cereal boxes, shoeboxes, etc.
- **Arts materials:** glue, paper clips, pieces of Velcro, tape, string, elastic bands, pompoms, beads, bells, bingo dabbers, gel bags, paper, clipboards, Post-It Notes, cards, small white boards or chalkboards, markers, pencils, pens, crayons, pencil crayons, paint
- **Building materials:** marbles, discs, wheels of varying sizes, toothpicks, tubes, plasticine or playdough and other building materials, drums
- **Natural materials:** twigs, rocks, stones, shells, sand, feathers.
- **Technology:** Tablet or laptop for research/showing videos, use of D2L, printer, 3D Printer, digital cameras, magnifying glass, microscope, etc.
- **Samples of Canadian innovations** (See Experience #3, page 10 for ideas)

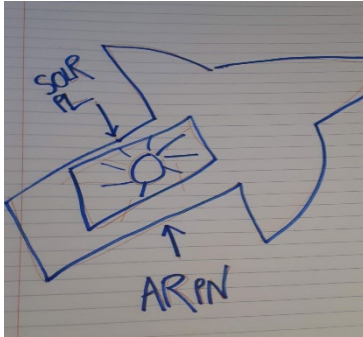
Learning Experience 3: How Do Innovators Test and Improve?

TIME TO CREATE, TEST, AND IMPROVE!

When your **Innovation Space** is ready to go,

IT'S TIME TO START PLANNING, CREATING
AND TESTING YOUR IDEAS.

Example:



Encourage children to label their plans and creations as they go!

Let them experiment with letters and words at their own level.

This airplane (arpln) has a solar panel (solr pl)!



TEST:

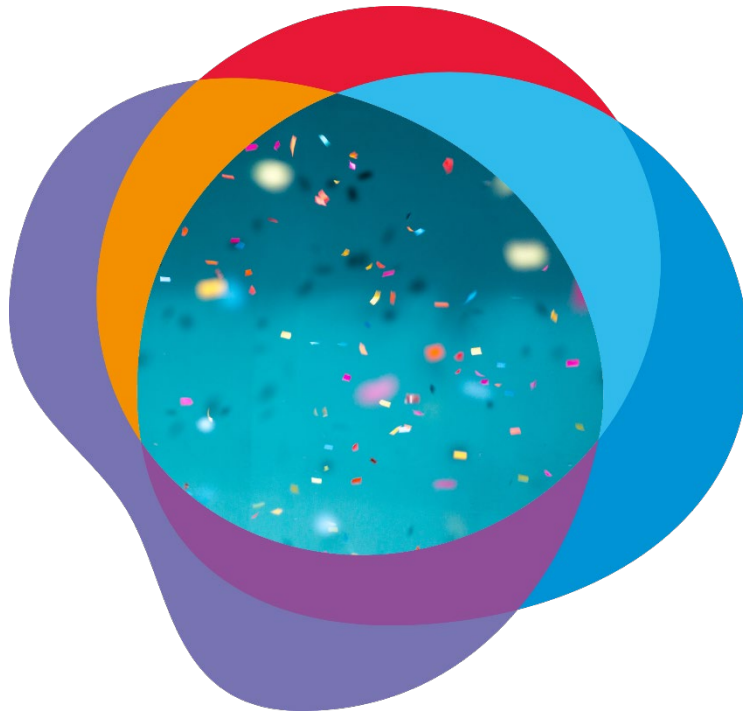
- Have your child test his /her innovations out.
- If the innovation doesn't hold up, send them back to the Innovation Station for repair, re-planning, reconfiguring, stronger materials, etc.
- Remind your young innovator that innovators go through many attempts and learn from mistakes and first flops!
- Don't give up!



Learning Experience 4: How Do Innovators Share?

CELEBRATE!
SHARE YOUR INNOVATIONS WITH THE REST OF CANADA!

- Send photos and videos of your child's innovations to Canadian Innovation Space's Innovation Showcase
<https://canadianinnovationspace.ca/innovation/>
- Or share your child's innovation journey online with your family and friends and our Instagram page [@CanadianInnovationSpace](#) !



Learning Experience 5: What are Canadian Innovations?

Did you know that Canadians have created many wonderful innovations?
Let's find out what they are!

Some Canadian innovations are:

- **Sports:** hockey, lacrosse, basketball, goalie mask, snowshoe
- **Arts:** Cirque de Soleil, Group of Seven, IMAX, dinner theatre, movie theatre
- **Food:** maple syrup, Shreddies, chocolate bar, McIntosh apple, peanut butter
- **Health/Safety:** life jacket, foghorn, insulin, electric wheelchair, air ambulance
- **Communications:** telephone, pager, walkie-talkie, BlackBerry, electric radio
- **Snow-related:** snowshoes, snowmobile, toboggan
- **Environment:** garbage bag, recycle box
- **Transportation:** canoe, toboggan, snowmobile, dump truck

Further examples of Canadian innovations can be found at:

<https://canadianinnovationspace.ca/category/stories/>

Videos

Watch how these Canadian Innovations were created!

- **Life Jacket:** <https://canadianinnovationspace.ca/resources/the-life-jacket/>
- **Zipper:** <https://canadianinnovationspace.ca/resources/zipper-innovation/>
- **Multi-Touch Screen:** <https://canadianinnovationspace.ca/resources/multi-touch-screen-technology/>

TIME FOR YOU TO GET INVOLVED IN CANADIAN INNOVATIONS!

These activities are focused on the topic of Canadian transportation innovations.

Read/View: *We All Go Travelling by*, by Sheena Roberts. <https://goo.gl/WF5dbo>

- Talk about the many ways that people get from one place to another. The ways that we travel are called *transportation*.
- Have your child draw and label some of these examples on paper

Ask :

- What forms of transportation did you see?
- What was different about each form of transportation?
- What was the same?
- Can you think of other ways to travel?
- What is your favourite mode of transportation?

Discuss newer modes of transportation such as: driverless cars, light rail transit.



TIME TO INNOVATE!

Create ideas for new and different modes of transportation that we do not have today. Brainstorm new forms of transportation.

Ask:

- What would this mode of transportation look like?
- What would it do?
- Would it be on land, water or the air...or all 3?

Guide your child in developing a plan in his/her notebook for a new transportation innovation.

Once the idea plan is finished, send your child to your **Innovation Station** to create a model of the new transportation idea. Don't forget to test it out!

Innovation Station

- Invite children to try to improve any current form of transportation or to create a new mode of transportation using their imagination.
- Ensure that the centre includes a variety of materials for making or improving a mode of transportation.
- Plan, create, test, re-pair and try again!

TIME TO CELEBRATE!

It's time to SHARE your innovation! Post photos or videos on the Innovation Showcase at CanadianInnovationSpace.ca/innovation/ or share online with family and friends.

Learning Extensions:

- Choose other *Canadian Innovation samples* from the provided list above and work on ideas and creations to improve them!
- Remember to use the **Innovation Showcase** and to document photos and videos.
- Don't forget to follow the Innovation Cycle: **Inquire, Plan, Test, Share!**

Innovation Read Aloud Books

Beautiful Oops! by Barney Saltzberg <https://www.youtube.com/watch?v=Wbj3Hux0jM>

- It's OK to make a mistake. In fact, hooray for mistakes! A mistake is an adventure in creativity, a portal of discovery.
- *Prompts: Is it okay to make mistakes? Why? If we make a mistake should we just give up? Why? What are some ways we can learn from our mistakes?*

If I Build a Car by Chris Van Dusen <https://www.youtube.com/watch?v=t-uX-5DyULA>

- Young Jack is giving an eye-opening tour of the car he'd like to build. There's a snack bar, a pool, and even a robot named Robert to act as chauffeur
- *Prompts: How would you build a car? What are the important parts to a car? What would add to make your car better?*

Imagine by Marija Katic and Dale Kern <https://www.youtube.com/watch?v=PcVmo4Ffqto>

- Travel along with Angel on her journey as she imagines what might happen if...
- *Prompts: How will you use your imagination today? What ideas will you come up with? What could happen if? What else might happen?*

Ish by Peter H. Reynolds <https://www.youtube.com/watch?v=DffTqF9t4Hk>

- Drawing is what Ramon does. It's what makes him happy. But in one split second, all that changes. A single reckless remark by Ramon's older brother, Leon, turns Ramon's carefree sketches into joyless struggles.
- *Prompts: How would you feel if someone said something mean about something you were very proud of? How can we make sure that we do not use hurtful words? Does our work have to be perfect?*

Not a Box by Antoinette Portis <https://www.youtube.com/watch?v=PMCKXaFsmCA>

- A box is just a box . . . unless it's not a box. From mountain to rocket ship, a small rabbit shows that a box will go as far as the imagination allows.
- *Prompts: What are some different ways you would play with a box? What are some other objects we could use our imagination to play with?*

Not a Stick by Antoinette Portis <https://www.youtube.com/watch?v=brtsSuJJ2Ww>

- With a stick in hand, the options are endless—whether it's conducting an orchestra, painting a masterpiece, or slaying a dragon.
- *Prompts: What are some different ways you would play with a stick? How could we use the stick and a box together using our imagination?*

Pete the Cat: Go, Pete, Go! by James Dean <https://www.youtube.com/watch?v=sRuNnYa7pos>

- New York Times bestselling author-artist James Dean brings us a new Pete the Cat adventure, a special reimagining of “The Tortoise and the Hare” as a race between Pete and Turtle, in Pete the Cat: Go, Pete, Go!
- *Prompts: Which vehicle is fast? Why? What are some changes we can make to each vehicle to make them faster?*

Rosie Revere, Engineer by Andrea Beaty <https://www.youtube.com/watch?v=3sNVhNThxcc>

- Rosie may seem quiet during the day, but at night she's a brilliant inventor of gizmos and gadgets who dreams of becoming a great engineer.
- *Prompts: How does Rosie use the innovation process to create her creations? Why is it important to innovate? What can you learn from Rosie's mistakes?*

Sheep in a Jeep by Nancy E. Shaw <https://www.youtube.com/watch?v=0jD2Jl84U3g>

- A flock of hapless sheep drive through the country in this rhyming picture book.
- *Prompts: Why couldn't the jeep move? What can we do to make this jeep work better? Could we use the parts of the jeep for other things?*

Sky Colour by Peter H. Reynolds <https://www.youtube.com/watch?v=ehfb86HoEzA>

- Marisol loves to paint. So when her teacher asks her to help make a mural for the school library, she can't wait to begin! But how can Marisol make a sky without blue paint?
- *Prompts: Does our artwork have to be perfect with the colours, shapes and lines we use? Why? Do our inventions have to be perfect? Do they have to be based on inventions that have already been made? Why?*

The Dot by Peter H. Reynolds <https://www.youtube.com/watch?v=t5mGeR4AQdM>

- Vashti can't draw - she's no artist. To prove her point, Vashti jabs at a blank sheet of paper to make an unremarkable and angry mark.
- *Prompts: Why is it important to be creative and use your imagination? Is everyone's artwork the same? Why not? Is that good or bad?*

The Most Magnificent Thing by Ashley Spires <https://www.youtube.com/watch?v=UM8oN4yzJqw>

- A little girl and her dog assistant set out to make the most magnificent thing. But after much hard work, the end result is not what the girl had in mind.
- *Prompts: If we get stuck working on our inventions, should we give up? What are some ways to help us get un-stuck?*

We All Go Travelling By by Sheena Roberts <https://www.youtube.com/watch?v=cSw50Jw0H34>

- This story takes readers aboard a school bus as they travel by different forms of transportation.
- *Prompts: What forms of transportation did you see? What is different about each form of transportation? What was the same? Can you think of other ways to travel?*

What Do You Do with an Idea? by Kobi Yamada <https://www.youtube.com/watch?v=mSfNv0-SgJM>

- This is the story of one brilliant idea and the child who helps to bring it into the world. As the child's confidence grows, so does the idea itself.
- *Prompts: What would children do with an idea? If you are ever stuck while thinking about an idea, what could you do to solve it?*