Introduction to the Science and Innovation in Kindergarten Resources

This resource was created to help educators to develop the skills and attitudes for students in the Early Years to become problem solvers and innovators. The resource highlights two important processes in the frame of Problem Solving and Innovating in the Kindergarten Program: The Inquiry Process and the Technological Problem-Solving Process.

Both overall and specific expectations have been included in each of the inquiry and design process learning experiences/projects. The intended purpose of the overview of program expectations at the beginning of each project, demonstrates a snapshot of what the inquiry or design process may address or cover if each experience outlined in this project is delivered/covered. During your facilitation of these projects, keep in mind the children in your class, your learning environment, and your own knowledge and expertise, may allow for adjustments or modifications to the project experiences. Changing the project experiences, will reflect an overall change to the table that contains the overview expectations of the entire project set out at the beginning.

The writing team developed four resources that provide starting points, resource ideas and invitations for learning that educators can use to begin an inquiry. It also includes four resources that educators that can use to begin a design thinking challenge. This resource includes tips on how to incorporate technology for documentation, how pedagogical documentation can be used to plan next steps and how to personalize these resources for any classroom and group of children.

It is important to note that these resources were intended to provide ideas and sparks to begin an inquiry or design challenge. Every group of students has their own set of experiences, questions and perspectives on different topics. Learning is made more meaningful when educators take their own students' observations and wonder questions into account when planning further invitations for learning and experiences for their students. When working through the inquiry and design process it is important to choose materials that are reflective of students. As educators we need to ensure that students see themselves in texts (picture books) and examples used. In our classrooms, we have various types of learners. Therefore, creating activities that allow students to show their learning and understanding.

Children will enter school with a variety of experiences and communication skills. Technological design challenges and inquiry are best supported by children having prior knowledge of the subject so that their understanding can be deepened and explored further. As such it is important that children are exploring design problems that are meaningful and relevant to their own lives in order to be as engaging as possible.

As needed, educator teams may wish to take time to instruct directly and/or activate prior knowledge about basic STEM concepts (e.g., simple machines, gardens, directionality, how animals change through the seasons, weather) before introducing inquiry and/or design challenges.

Educator teams need to work together to learn about who their students are and examine their prior knowledge. Doing so will help to encourage a richer, more meaningful inquiry process and design problems.

Ideas to help activate students' prior knowledge:

- Have a knowledge-building circle in a small or large group
- Read aloud a book related to the topic and engage children in a conversation afterward
- Ask students a question or two at a learning centre when they are engaged with related materials

Prior to writing the resource, the writing team outlined a set of 4 key principles that we wanted to stay true to when writing the resource. It is our hope that you see these principles reflected in the resource. It is our hope that these resources support educators in feeling comfortable in creating experiences and invitations for learning that develop the skills for problem solving and innovating in our youngest learners.

1. This resource uses inquiry based learning, placing the child, their voice and their questions at the centre of learning thinking about all children's lived experiences from varied communities across Ontario.
2. This resource considers invitations for learning that can lead to provocations/design problems or can serve as stand alone learning opportunities.
3. The Four Frames informs the planning, and implementation of invitations for learning and design problems.
4. Noticing and naming the learning is a developmentally appropriate approach to documenting, and making student thinking visible.