

Exploring Mathematics in an Inquiry-Based FDK Program

An overview of Mathematics in our classroom.

By Brenda Fowler



Full-Day Kindergarten

Curriculum is the heart of what we do in our classroom. The Government of Ontario has divided the Early Learning document into four frames of focus. In the Kindergarten program, four "frames", or broad areas of learning, are used to structure thinking about learning and assessment. The frames - Belonging and Contributing, Self-Regulation and Well-Being, Demonstrating Literacy and Mathematics Behaviours, and Problem Solving and Innovating- are designed to support an approach that aligns with the way children's learning naturally occurs and that focuses on aspects of learning that are critical to young children's development. The frames reflect the integrated way in which learning occurs during children's play and inquiry in Kindergarten.

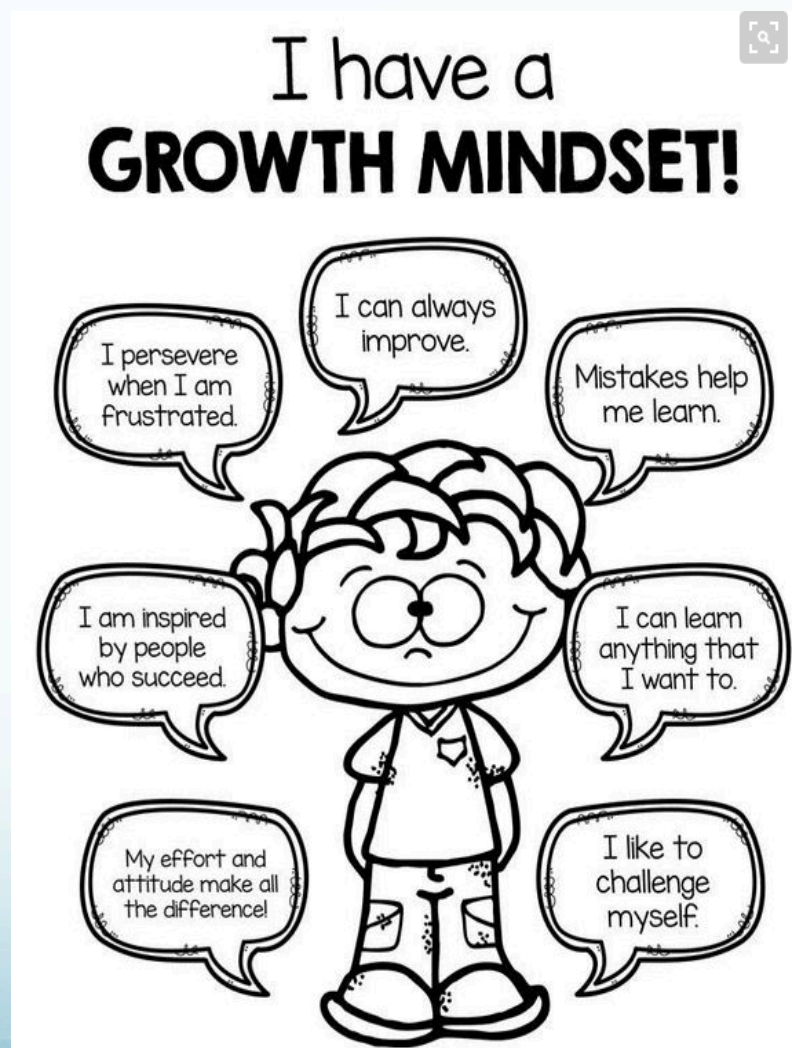
Our Math document includes 5 strands including **Number Sense and Numeration, Measurement, Geometry and Spatial Sense, Patterning, Data management.**

For more information about the Ontario Kindergarten Program and to see the complete document please visit:

<http://www.edu.gov.on.ca/eng/curriculum/elementary/kindergarten.html>

Positive Growth Mindset

As a child, who remembers disliking Math? I felt Math was really "hard" when I was a child. My Math marks showed I was doing well but I honestly did not understand the big ideas underlying the concepts I was using to solve the problems. I spent most of my time memorizing the facts. My readings and current practice with 'Number Talks' has shown me it's not about how 'smart' you feel about Math, but how hard you work and persist with any given activity. I want to help children change their mindsets towards math and discover there are many different ways to analyze, interpret and solve a math problem. Math can be an enjoyable activity and is hugely relevant to our lives. I also wanted to change my own mindset towards math as an educator and parent. One of the major influences on students being able to learn Math is how comfortable the teacher feels teaching the Math curriculum.



Our Program

Children's early learning experiences have a profound effect on their development. Early interactions directly affect the way connections are made within the brain. To give each child the best start possible our Kindergarten program provides a variety of learning opportunities and experiences that challenge and engage children while building confidence - providing foundations in cognitive, physical, emotional, and social development.

We will explore lots of teacher-guided and child-initiated opportunities which appeal to each child's learning style. We want to help develop life long learners! Reaching each child's potential while supporting learning development is the main goal of our kindergarten program.

Children, especially Kindergarten students, can't be expected to learn all math concepts through rote memorization or by practicing Math facts in isolation of the conceptual knowledge.



Tell me and I'll forget;
show me and I may remember;
involve me and I'll understand.
~ Chinese Proverb

How do students learn Mathematics?

True or False?

Worksheets
help prepare
children for
kindergarten

FALSE!

- Most worksheets can only be used one way. Worksheets generally require children to think that there is only a single correct way to use them, and they require little, if any, higher-order thinking. Worksheets typically have one "right" answer.
- Children develop a love for math through games, hands-on activities, and real world scenarios. They learn to solve problems mentally, think critically, and develop strategies that will enable them to solve complex problems.

Want more information...

http://www.pre-kpages.com/no_more_worksheets

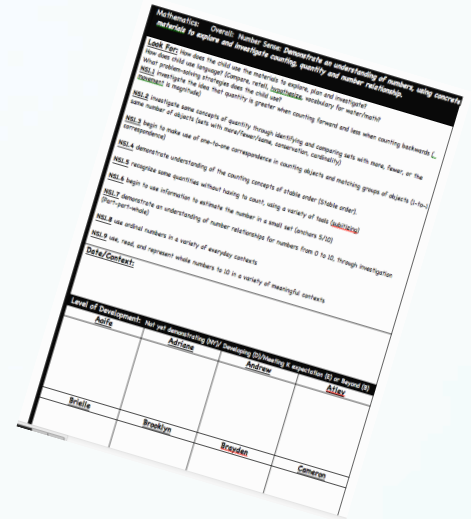
http://www.earlychildhoodnews.com/earlychildhood/article_view.aspx?ArticleID=134

<http://www.edu.gov.on.ca/eng/literacynumeracy/parentGuideNumEn.pdf>

If there are no worksheets, how do I know how my child is doing in Math?

Teachers will provide evidence of learning using:

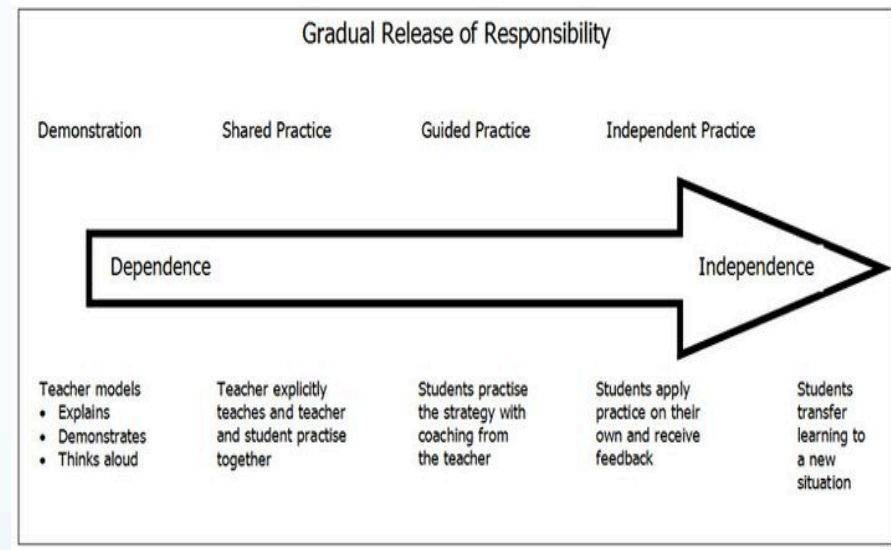
- Work Samples
- Portfolios- Parents can see them through the year.
- Photographs showing the students working and learning
- Observational Records
- Checklists
- Parent Newsletters: I will send home [parent newsletters](#) which explain the activities children are doing at school and how they relate to the Full Day Kindergarten Program Expectations. As parents, when you understand the value of developmentally appropriate activities, you will feel confident that their children are learning and growing, not "just playing."



Gradual Release of Responsibility in a Playful Learning Environment

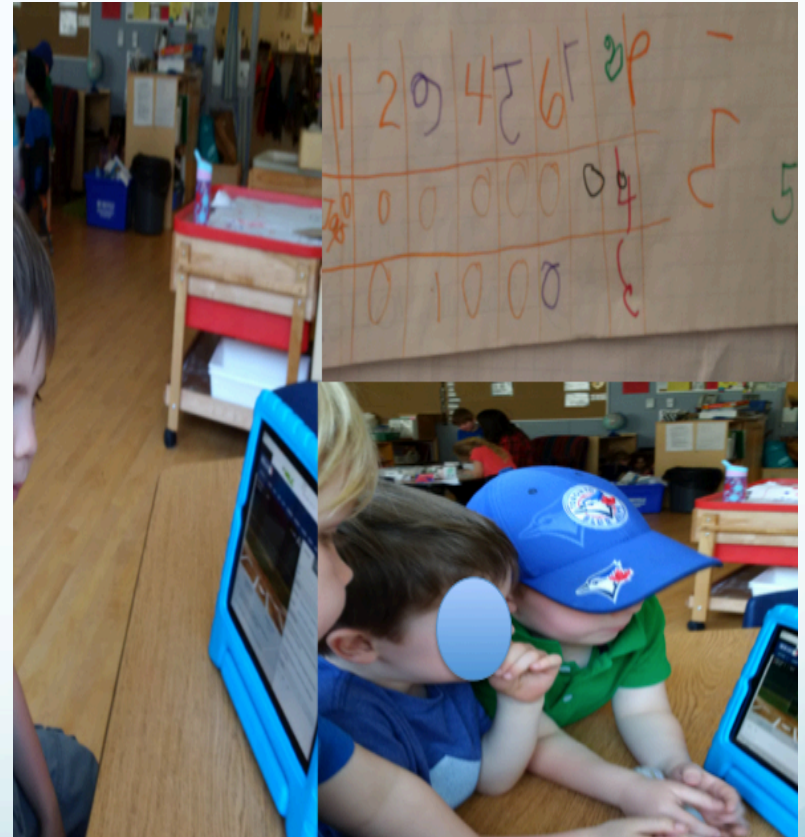
The goal in an inquiry-based environment is for children to be comfortable and confident applying mathematical strategies in authentic problem-solving situations. A teacher helps children be successful by first introducing the 'big ideas' of math in a whole group situation and then providing numerous opportunities for children to practice using the tools, terminology and strategies in authentic contexts during small group time and the open play block.

For example, during circle time the educator might introduce a ten frame, demonstrate how to use it for various purposes (e.g., subitizing, counting, recording, adding) and then encourage children to independently use the ten frame in small group activities and play.



Meaningful Math through Inquiry

In inquiry-based programs, teachers aim to integrate rich math resources and opportunities throughout the room and not just in a defined 'Math Centre' in order to encourage exploration. The children are investigating and finding solutions to questions or problems generated in the social interactions they have during learning time. Teachers can bring these inquiry-based topics to the whole group for further discussion, specifically highlighting math and computation when applicable. Since children are highly invested in solving these problems, they will be more likely to work together to brainstorm various strategies for arriving at solutions.



How honouring student interest leads to a group of boys watching the Blue Jays inspiring the creation a scoreboard and pitch counting on the MLB tracker.

How teachers teach mathematics?

- Using problem solving questions that allow for different entry points into the problem-solving process, allowing more than one solution, promoting student talk about the strategies, and thoughtful questioning, the teacher ensures all students are valued as learners and that students gain an understanding of their own thinking.
- Students who are working in an environment in which they feel valued and safe can make or break collaborative learning of math. They all do not learn at the same rate, but with different methods and strategies it is possible.
- Students should not be thought of as mindless individuals just waiting to be filled with knowledge by their teachers.

Students learn from each other

- I feel students learn Mathematics best in collaborative learning opportunities while giving me the opportunity to observe and gather information about each individual student's ideas, understandings, and processes while students are working in groups.
- This assessment information can be used to plan next steps and future learning experiences. When listening, I can also determine the students' interests, strengths and questions and respond to them and provide the students with more authentic 'real world' learning opportunities.
- An emergent kindergarten program creates opportunities for purposeful computation by:

providing children the freedom to explore self-directed areas of interest and introducing interesting

and challenging open-ended materials for children to use independently and with teacher guidance.

Ways to Support Your Child's Math Learning at Home

- 1. Count! Count anything! Some things that you can have your child count are: spoons, forks in the drawer, number of flowers in the garden, number of kids at the party, number of cars in line, etc. Have your child count out groups of objects into little piles (coins, buttons, paper clips). "Can you put 15 fish crackers in your snack container for tomorrow?"
- 2. Play Chutes and Ladders, Candyland, Checkers, simple cards games such as Crazy Eights, Old Maid, etc.
- 3. Provide hands on experiences related to basic facts to 10. For example, "If you have two crayons and I give you two more, then how many will you have?"
- 4. Teach your child to dial the phone. Make a phone book of Grandma and Grandpa and cousin Fred's phone numbers. Have your child memorize his/her phone number. Any phone number can be sung to the tune of "Twinkle, Twinkle, Little Star."
- 5. Teach your child to set the timer on the microwave. Discuss the numbers on a clock and start teaching time on the hour.
- 6. Read books which have a math theme imbedded in them. Your local public library will have a section for you to borrow from.
- 7. Pick a mystery shape and give your child clues as to what that shape may be. Have them try to guess the shape.
- 8. Find numbers and letters to discuss wherever you go! Room numbers, elevator buttons, street numbers, road signs, price tags, business signs.

Parent-Teacher Communication

The home-school connection is an essential component of children's school success. When we work together, we form a bond that a child can rely on, knowing that everyone cares about his or her best interest.

Check out our website

<http://teachers.wrdsb.ca/fowlerb/>

Also log-in to the Seesaw app on a regular basis to learn about what we are doing at school to support your child's math learning.