Math is Everywhere

A Workshop for Parents

Using Family Math Videos

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Math is Everywhere:
A Workshop for Parents

Family Math Canada has produced a series of three videos to help parents develop their young children's math skills through activities like reading a book, going for a walk, or emptying a grocery bag. This workshop is designed as an educational experience that will inform parents about home activities to enhance their children's mathematical understanding. The videos demonstrate ways to expand parents' thinking about "doing math" and "talking math" with their children.

The videos and parent workshops focus on aspects of Number Sense and Numeration, Geometry, Measurement, Patterning, and Data Management and Probability that are typically part of daily family activities. The mathematical concepts are highlighted throughout the videos (voice-over and on-screen print) and in guided discussions throughout the workshop.

Research shows that students do better at school when their parents are involved in their education. Given early parental support, children have opportunities to maintain positive attitudes toward math, which is key to math success.

This series of videos stresses -

- Math takes practice.
- Children won't be perfect and that's' ok.
- Ask, don't tell.
- Ask why.
- Build on what your child already knows and what they don't yet understand.
- Mistakes are part of learning.
- Math is everywhere.

Please note that when we use the term "parents" we are referring to **all caregivers**.

How This Workshop Can Be Used

This workshop can be used with parents in one 2-hour session **or** in three 1-hour sessions.

- If offering one 2-hour session choose one extension activity for each video.
- If offering three 1-hour sessions use 2 or 3 of the extensions for each video.

The **Overview** page outlines suggested time frames.
Please remember, the workshop is designed to be adapted to meet the needs of your community.

OVERVIEW

	Video 1 Family + Reading = Math	**Video 2** Family + A Walk = Math	**Video 3** Family + A Grocery Bag = Math	**Allotted time**
Welcome				
1 Introductory Activity	Over in the Meadow	Measurement Walk	Estimate boxes	**8 minutes**
2 Watch Video	Family + Reading = Math	Family + A Walk = Math	Family + A Grocery Bag = Math	**8 minutes**
3 Where's the Math Chart - Video	Explain the 5 strands.	Review the 5 strands.	What can you tell me about the 5 strands?	**8 minutes**
4 Where's the Math Chart – Introductory Activity	Over in the Meadow	Review measurement walk.	Estimate boxes.	**5 minutes**
5 Extension #1	With a partner, read book and identify math.	In groups, discuss a seasonal math walk.	Count the boxes from the grocery bag – using 10 frame.	**8 minutes**
6 Extension #2	With a partner, find alternate strand for chosen book.	Tally number of items that are as long as your hand.	Brainstorm "Math in the Fridge" and "Math in the pots and pans cupboard".	
7 Extension #3	Listen to Mathematical version of Wheels the Bus.	Walking stick	What math can you find with your kitchen towel?	
8 Farewell Activity	Blue Hat, Green Hat	Name the walking pattern.	Make a pattern with 5 crackers.	**5 minutes**
Parents' Book	• Where's the Math Chart • Family Math Words to Wheels the Bus	• Notes page for seasonal walks • Tally Sheet	• Fridge door activity • ten frame	
Handout	A Parent Book of their own		• Music CD • magnet	

Video # 1 Activity 1: Introductory Activity: Over in the Meadow

Materials:

- copy of Over in the Meadow (Keats)
- Family Math Music CD #11 (optional)

Instructions:

1. This book is used as a way for participants to experience finding math in "storybooks".
2. Leader reads the story encouraging participants to join in.
3. Leader models good questioning for the parents by stopping to discuss various families in the book with comments such as:
    - Three babies and one mother ... How many are there?
    - Six in this family. How many babies?

Where's the Learning?

This story contains a repetitive counting pattern. There is also the adding pattern of "one more" as seen in "three babies and one mother".

Curriculum Expectations:

Kindergarten:

NS1.11	• investigate and develop strategies for composing and decomposing quantities to 10 *(e.g., use manipulatives or "shake and spill" activities)*
NS1.12	• investigate addition and subtraction
NS1.4	• demonstrate understanding of the counting concepts of stable order *(i.e., the concept that the counting sequence is always the same – 1 is followed by 2, 2 by 3, and so on)* and of order irrelevance *(i.e., the concept that the number of objects in a set will be the same regardless of which object is used to begin the counting)*
Mathematical Processes	• Problem Solving, Reflecting

Grade One:

N(s)	•compose and decompose numbers up to 20 in a variety of ways, using concrete materials

Video # 1 Activity 2: Watching Video: Family + Reading = Math

Materials:

- copy of video or on-line connection
- facility for projection to a group

Instructions:

1. A word to the parents:
   Often when we think of math and books we think of counting books, shape books and workbooks. But math can be uncovered in nearly every book. Watch as three families explore the mathematics in their book.
2. Explanation of the Family Math video series:
   Family Math Canada has produced a series of three videos to help parents develop a positive attitude to math through a better understanding of how math makes sense in the real world. Parents are then in a position to help their children see the mathematics that is in their everyday world, and help them make connections between real world math and school math. Real life activities like reading a book, going for a walk, or emptying a grocery bag are featured in these videos. The videos highlight all strands in the mathematics curriculum.
3. Watch the video.

Where's the Learning?

In this video Geometry, Number Sense and Numeration and Patterning are highlighted.

Curriculum Expectations:

See Video 3 Activity # 3 for the expectations

Video # 1 Activity 3: Where's the Math Chart: Family + Reading = Math

Materials:

- Large laminated copy of Where's the Math chart
- Erasable markers in various colours

Where's the Math?

Strands → / Activities ↓	**Number Sense & Numeration**	**Measurement**	**Geometry and Spatial Sense**	**Patterning and Algebra**	**Data Management & Probability**
Where's the Math - video					
Where's the Math – introductory activity					
Extension #1					
Extension #2					
Extension #3					
Farewell Activity					

***Using the last 4 rows of the chart are optional for all three videos.**

Instructions:

1. In this first meeting with the participants the leader will take time to explain the type of math in each strand. The leader will explain the chart using words, graphics and symbols. A different colour for each strand could assist the visual learner, and organizes the material for greater clarity For example:

   Number Sense and Numeration - Write numbers (1, 2, 3, 4, 5, 6, 7, …), symbols for addition, subtraction, multiplication and division

   Measurement – Include words "distance, weight, capacity". *Because the curriculum doesn't introduce standard measure until Grade two, it is recommended that you do not use a ruler as a symbol for measurement.*

   Geometry and Spatial Sense *- Draw various shapes*

   Patterning and Algebra - Explain to parents that a pattern is a sequence that repeats. When you do enough of them you'll soon be able to predict what comes next. Draw a pattern such as □△□△□△ 1,2,3…11,12,13…21,22,23…

Data Management and Probability –Explain that Data Management means managing information. It can be through a graph, a number line, a tally sheet or any format that organizes data. Include the word "graph" to explain Data Management. Phrases such as "Chances are" and "Probably" show how Probability is used in early math learning and everyday situations.

2. As a group, discuss the video in terms of the math strands that were present. Use a large check mark, or other means, for indicating the major math strand evident, and smaller check marks for the minor strands.
3. Using the terminology of the mathematics curriculum empowers parents and helps them become more comfortable in talking with teachers about their child's mathematics education.

Where's the Learning?

The families in this video modelled techniques for finding math in almost any book. They showed that this well known story/song can be used as a starting point for more discussion. Connections between mathematics and families' daily lives can be seen in this book and many more. The highlighted mathematics in the video included:

- Geometry
- Number Sense and Numeration
- Patterning

Curriculum Expectations:

Kindergarten:

"Reading books aloud and in shared reading contexts provides real links between literature and mathematical ideas, since some stories use mathematical terminology and/or contain illustrations of mathematical concepts. Reading can also give children a sense of how mathematics is connected with other aspects of life".

The Full Day Early Learning Program - Mathematics p 93

Mathematical Processes • Communicating

Grade One:

Throughout Grade 1, students will:

"communicate mathematical thinking orally, visually, and in writing, using everyday language, a developing mathematical vocabulary, and a variety of representations."
The Ontario Mathematics Curriculum p 32 Grade 1 Mathematical Process

Video # 1 Activity 4: Where's the Math Chart: Over in the Meadow

Materials:

- Large laminated copy of Where's the Math chart
- Erasable markers in various colours

Where's the Math?

Strands → / Activities ↓	**Number Sense & Numeration**	**Measurement**	**Geometry and Spatial Sense**	**Patterning and Algebra**	**Data Management & Probability**
Where's the Math - video					
Where's the Math – introductory activity					
Extension #1					
Extension #2					
Extension #3					
Farewell Activity					

Instructions:

1. As a group, discuss the activity of listening to Over in the Meadow looking for the math strands that were present. Use a large check mark, or other means, for indicating the major math strand evident, and smaller check marks for the minor strands.
2. Using the terminology of the mathematics curriculum helps parents become more comfortable in talking with teachers about their child's mathematics education.

Where's the Learning?

This story contains a repetitive counting pattern. There is also the adding pattern of "one more" as seen in "three babies and one mother". It provides an opportunity for children to practice "counting on" from a given number rather than going back to start at one every time.

Curriculum Expectations:

Kindergarten:

NS1.11 • investigate and develop strategies for composing and decomposing quantities to 10 *(e.g., use manipulatives or "shake and spill" activities)*

NS1.12 • investigate addition and subtraction

NS1.4 • demonstrate understanding of the counting concepts of stable order *(i.e., the concept that the counting sequence is always the same – 1 is followed by 2, 2 by 3, and so on)* and of order irrelevance *(i.e., the concept that the number of objects in a set will be the same regardless of which object is used to begin the counting)*

Mathematical Processes • Problem Solving, Reflecting

Grade One:

N(s) •compose and decompose numbers up to 20 in a variety of ways, using concrete materials

Video # 1 Activity 5: Extension #1: Finding Math in a Book

Materials:

- Variety of books
- Parents' Book page 1
- Pens/pencils

Instructions:

1. Working with a partner, participants will choose a book to explore for mathematical opportunities. Remind them to return it to the same spot. Stress good questioning techniques such as:
   - How many _____ do you see?
   - Can you find a rectangle on this page? How many?
   - Tell me about the shape.
   - What do you think will come next? Why?
   - Probably this will happen next. Why?
   - How long/tall is _____?
2. Participants are encouraged to keep track of the questions that they might ask their children on page 1 of the Parents' Book. Recall with participants the questions modeled in the videos and in the Introductory Activity.
3. Parents then fill in the strand chart at the top of page 1 in the Parents' Book checking which strands of math they found in their book.
4. If there is time partners may share their findings with the group.

Where's the Learning?

Parents are familiarizing themselves with the breadth of the Mathematics Curriculum. They are also practising good questioning techniques such as:

- Ask, don't tell.
- Predict, Discover, Discuss.

Working with a partner improves confidence and increases the variety of ideas. Talking through mathematical thinking enhances understanding.

Video # 1 Activity 6: Extension #2: Change the Strand

Materials:

- Table with a variety of books sorted according to the chart with each strand labelled
- Pens/pencils

Change the Strand

	Number Sense and Numeration	**Measurement**	**Geometry and spatial Sense**	**Patterning and Algebra**	**Data management and Probability**
Books	One is a Snail	Goodnight Moon	Rosie's Walk	Going on a Bear Hunt	The Mitten
	Five Little Ducks	Mouse Count	Grandfather Tang	The Napping House	If you Give a Mouse a Cookie
	Hundredth Day Worries	Everybody Needs a Rock	Blue Balloon	Barnyard Dance	Big Hungry Bear
	Over in the Meadow	Counting on Frank	Frog and Toad – The Button chapter pg	Time for Bed	There was an Old Lady
	Mouse Count		The Best Bug Parade	Tacky the Penguin	

Instructions:

1. Working with a partner, participants will take a book from one strand and read it.
2. They will then return the book to the table **in a different strand.**
3. If there is time participants will share their findings with the group.

Where's the Learning?

Parents are familiarizing themselves with the breadth of the Mathematics Curriculum. Working with a partner improves confidence and variety of ideas.
This activity models for participants that there is often more than one correct answer to a mathematical challenge. As long as the solution can be clearly and correctly supported it should be accepted . A clear explanation, using faulty logic, should not be accepted. Participants may struggle with this concept as they were often taught that there is only one right answer.

Video # 1 Activity 7: Extension #3: Wheels on the Bus

Materials:

- Copy of Family Math Music CD, #15
- CD player
- Parents book page 1 – Words for *Mathematical* Wheels on the Bus

Instructions:

1. Play mathematical version of Wheels on the Bus while participants follow along with the words printed in the Parents' Book. They are encouraged to sing along.
2. A brief discussion will highlight the strands of math mentioned in the song. Be sure to ask parents to explain their answers. For example, "Tell me about the language of geometry you heard in the song."
3. Be sure to note that these special mathematical words to **Wheels on the Bus** are found on page 1 of the Parents' Book.

Where's the Learning?

Parents are familiarizing themselves with the breadth and depth of the Mathematics Curriculum.

The Wheels on the Bus

The wheels on the bus are round, round, round.
Round, round, round. - round, round, round.
The wheels on the bus are round, round, round.
All through the town.

The doors on the bus are big rectangles.
Big rectangles, big rectangles.
The doors on the bus are big rectangles
And they open and close all day.
From the bus you see a yellow triangle, yellow triangle, yellow triangle.
From the bus you see a yellow triangle.
The yield sign at the corner.

From the bus you see a red octagon.
A red octagon, a red octagon.
From the bus you see a red octagon.
The stop sign at the corner.

From the bus you see red-yellow-green, red-yellow-green
Red-yellow-green.
From the bus you see red-yellow-green.
Traffic lights are a pattern.

Kids on the bus go up and down, up and down, up and down.
Kids on the bus go up and down. Can you repeat this pattern?

The people on the bus go in and out, in and out, in and out.
The people on the bus go in and out. Guess how many took the bus today?

Tell Mom and Dad about your ride today, your ride today, your ride today.
Tell Mom and Dad about your ride today shapes and patterns along the way.

Words by Judi Waters

Video # 1 Activity 8: Farewell Activity: Blue Hat, Green Hat

Materials:

- copy of Blue Hat, Green Hat (Boynton)

Instructions:

1. Leader reads the story while another leader claps the pattern:

   Blue hat, Green hat, Red hat, Oops
   Clap pat, clap pat, clap pat, hands in the air

2. Continue reading the book with the "clap, pat," pattern remembering to lift hands in the air every time "oops" is read.
3. Leader re-reads the story encouraging participants to join in.
4. Be sure to note that there is a list of quality books for finding math on page 2 of the Parents' Book.

Where's the Learning?

This story provides excellent opportunities for families to take part in a repetitive clapping pattern. The pattern varies slightly in the middle and at the end. This variation heightens the involvement.

"The study of patterns supports children in learning to see relationships, to find connections, and to make generalizations and predictions. Understanding patterns nurtures the kind of mathematical thinking that helps children become problem solvers and abstract thinkers. It is problem solving."

N. C. T. M.
Curriculum and Evaluation Standards for School Mathematics
Addenda Series – Patterns. 1995

Curriculum Expectations:

Kindergarten:

P4.1 • identify, create, reproduce, and extend repeating patterns through investigation, using a variety of materials *(e.g., attribute blocks, pattern blocks, a hundreds chart toys, bottle tops, buttons, toothpicks)* and actions *(e.g., physical actions such as clapping, jumping, tapping)*

Mathematical Processes • Communicating

Grade One:

P(o) • identify, describe, extend, and create repeating patterns

Good Books to Find Math

Baylor, Byrd. Everybody Needs a Rock. New York: Aladdin Paperbacks, 1985.

Boynton, Sandra. Blue Hat, Green Hat. New York: Simon and Schuster, 1984.

Inkpen, Mick. The Blue Balloon. New York: Little, Brown and Company, 1989

Keats, Ezra Jack. Over in the Meadow. New York: Puffin Books, 1971.

Lobel, Arnold. Frog and Toad are Friends. New York: Harper Collins, 1970.

Murphy, Stuart. The Best Bug Parade. New York: HarperCollins Children's Books, 1996

Murphy, Stuart. A Pair of Socks. New York: HarperCollins Children's Books, 1996

Rosen, Michael and Helen Oxenbury. We're Going on a Bear Hunt. New York: Simon and Schuster, 1989.

Walsh, Ellen Stoll. Mouse Count. Singapore: Harcourt Brace & Company, 199

Adams, Pam. There Was An Old Lady Who Swallowed A Fly. Child's Play International, 2007

Lester, Helen. Tacky the Penguin. Houghton Mifflin, 2006

Numeroff. If You Give a Mouse a Cookie. Harper Collins, 1985.

Raffi. Wheels on the Bus. Crown Books,1998.

Sayre. One is a Snail, Ten is a Crab. Candlewick, 2006.

Wood, Audrey. The Napping House. Harcourt Trade Publishers, 2000.

Yolen, Jane. How Do Dinosaurs Say Good Night?. Blue Sky Press, 2000.

Clement, Rod. Counting on Frank. Milwaukee: Gareth Stevens Publishing, 1991.

Cuyler, Margery. 100th Day Worries. New York: Simon & Schuster, 1999.

Grifalconi, Ann. The Village of Round and Square Houses. New York: Little, Brown and Company, 1986.

Tompert, Ann. Grandfather Tang's Story. New York: Dragonfly Books, Crown Publishers Inc., 1990.

Children's Literature
Math Rap
(from **Family + Reading = Math**)

Children chatter.
Books that clatter'
Off the shelf they tumble down.
Opening, clapping.
Counting and snapping.
Measuring, patterning, going up and down.
Circles round.
Rectangles found.
Math is everywhere around - Yah!!

How many?
And
How many more?
And what would happen if?
And what's next in store 1 2 3 4?
Exploring math that is in a book.
Find more math, take another look.
Math is every where around.
Math is every where around.

Can you find the math today?
Can you hear the math they say?
Chatter and clatter,
Look some more.
Open that book 1 2 3 4 .

1 2 3 4
Math is everywhere around.
MATH IS EVERYWHERE AROUND.
Word to your Book.

Words by Judi Waters

Video # 2 Activity 1: Introductory Activity: Measurement Walk

Materials:

- none

Instructions:

1. After being seated, the participants are asked to:
   - Look around the room to find something that is as long as their arm.
   - Predict how many steps it will take them to reach this object.
   - Walk to the object counting their steps.
   - Compare their arm to the object.
2. Ask: "Where's the math?"

Where's the Learning?

Measurement begins by comparing 2 objects (e.g. a book shelf and the length of my arm) and developing the math language of longer, shorter and size. Estimation promotes a personal anchor or understanding of size. These skills are developed through practice and reflection.

> "It is important that children be provided with a wide range of materials so that they can develop a beginning understanding of measurement. Concrete experience in solving measurement problems gives students the foundation necessary for using measurement tools and applying their understanding of measurement relationships. Estimation activities help students to gain an awareness of the size of different units and to become familiar with the process of measuring,"
> The Ontario Curriculum Gr. 1-8 Mathematics, Strands in the Mathematics Curriculum, p.9

Curriculum Expectations:

Kindergarten:

M2.2 • demonstrate, through investigation, an awareness of non-standard measuring devices *(e.g., feet, hand spans, string, or cubes to measure length; hand claps to measure time; scoops of water or sand to measure capacity)* and standard measuring devices *(e.g., measuring cups at the water and sand centre, balance scales at the block centre)* and strategies for using them *(e.g., place common objects end to end to measure the length of the classroom; use cubes to plan the length of a road at the sand table or the block centre; use footsteps to measure the distance between the door and the sink)*

Mathematical Processes • Problem Solving, Selecting Tools and Strategies, Communicating

Grade One:

M(s) • demonstrate an understanding of the use of non-standard units of the same size.
• compare and order objects by their linear measurements, using the same non-standard unit.

Video # 2 Activity 2: Watching Video: Family + A Walk = Math

Materials:

- copy of video or on-line connection
- facility for projection to a group

Instructions:

1. A word to the parents:
   Often when we think of math in our everyday world we think of buying groceries and mentally adding up the bill; buying gas and the money required to pay for it. This video will help you see math in places that you may not have considered.
2. Review purposes of the Family Math video series:
   Family Math Canada has produced a series of three videos to help parents develop in their young children a positive attitude to math through a better understanding of its concepts. Real life activities like reading a book, going for a walk, or emptying a grocery bag are featured in these videos. The videos highlight all strands in the mathematics curriculum.
3. Watch the video.

Where's the Learning?

In this video Measurement, Number Sense and Numeration, Counting and Estimating and Geometry were highlighted.

Curriculum Expectations:

See Video 3 Activity # 3 for the expectations

Video # 2 Activity 3: Where's the Math Chart: Family + A Walk = Math

Materials:

- Large laminated copy of Where's the Math chart
- Erasable markers in various colours

Where's the Math?

Strands → / Activities ↓	**Number Sense & Numeration**	**Measurement**	**Geometry and Spatial Sense**	**Patterning and Algebra**	**Data Management & Probability**
Where's the Math - video					
Where's the Math – introductory activity					
Extension #1					
Extension #2					
Extension #3					
Farewell Activity					

Instructions:

1. The leader will take time to review the type of math in each strand. The leader will explain the chart using words, graphics and symbols. A variety of colours adds interest For example:

   Number Sense and Numeration - Write numbers (1, 2, 3, 4, 5, 6, 7, …), symbols for addition, subtraction, multiplication and division.
   Measurement – Include words "distance, weight, capacity". *Because the curriculum doesn't introduce standard measure until Grade two, it is recommended that you do not use a ruler as a symbol for measurement.*
   Geometry and Spatial Sense - *draw various shapes.*
   Patterning and Algebra - Explain to parents that a pattern is a sequence that repeats. When you do enough of them you'll soon be able to predict what comes next. Draw a pattern such as □△□△□△ 1,2,3…11,12,13…21,22,23…

Data Management and Probability –Explain that Data Management means managing information. It can be through a graph, a number line, a tally sheet or any format that organizes. Include the word "graph" to explain Data Management. Phrases such as "Chances are" and "Probably" show how Probability is used in early math learning.

2. As a group, discuss the video in terms of the math strands that were present. Use a large check mark, or other means, for indicating the major math strand evident, and smaller check marks for the minor strands.
3. Using the terminology of the mathematics curriculum helps parents become more comfortable in talking with teachers about their child's mathematics education.

Where's the Learning?

The families in this video modelled techniques for finding math outdoors.
They showed the value of pausing on their walk. Every time they stopped they looked for math:

- How long
- How many
- Guess
- Count
- Explain

Taking a walk can create interest and understanding about math. This becomes a starting point for a new attitude to math. Connections are made between mathematics and families' daily lives. While walking there are opportunities to reflect on and extend mathematical understanding. Talking and exploring deepens your child's understanding.

The highlighted mathematics in the video included:

- Measurement
- Number Sense and Numeration
- Counting and Estimating
- Geometry

Curriculum Expectations:

Measurement

Kindergarten:

M2.3 • demonstrate, through investigation, a beginning understanding of non-standard units that are the same type *(e.g., straws, paper clips)* but not always the same size.

Mathematical Processes • Problem solving

Grade One:

M(s) • estimate, measure (i.e., by placing non-standard units repeatedly, without overlaps or gaps), and record lengths, heights, and distances.

Number Sense and Numeration

Kindergarten:

NS1.6 • begin to use information to estimate the number in a small set *(e.g., apply knowledge of quantity, use a common reference such as a five frame).*

NS1.4 • demonstrate understanding of the counting concepts of stable order *(i.e., the concept that the counting sequence is always the same – 1 is followed by 2, 2 by 3, and so on)* and of order irrelevance *(i.e., the concept that the number of objects in a set will be the same regardless of which object is used to begin the counting.*

Geometry

Kindergarten:

G3.2 • identify and describe, using common geometric terms, two-dimensional shapes *(e.g., triangle)* and three-dimensional figures *(e.g., cone)* through investigation with concrete materials.

Video # 2 Activity 4: Where's the Math Chart: Measurement Walk

Materials:

- Large laminated copy of Where's the Math chart
- Erasable markers in various colours

Where's the Math?

Strands → / Activities ↓	**Number Sense & Numeration**	**Measurement**	**Geometry and Spatial Sense**	**Patterning and Algebra**	**Data Management & Probability**
Where's the Math - video					
Where's the Math – introductory activity					
Extension #1					
Extension #2					
Extension #3					
Farewell Activity					

Instructions:

1. As a group, discuss the measurement activity done at the beginning of this section, looking for the math strands that were present. Use a large check mark, or other means, for indicating the major math strand evident, and smaller check marks for the minor strands.
2. Using the terminology of the mathematics curriculum helps parents become more comfortable in talking with teachers about their child's mathematics education.

Where's the Learning?

This activity contains estimation and measurement.
Familiar, non-standard units of measure are used so that children gain an understanding of measurement. Placing the unit of measure - the hand - along side an object and comparing is a concrete beginning for comprehending linear measure. Giving the child a reference increases the child's ability to succeed in estimation and helps the child personally develop anchors or reference points for units of measure.

Curriculum Expectations:

Kindergarten:

M2.3 • demonstrate, through investigation, a beginning understanding of non-standard units that are the same type *(e.g., straws, paper clips)* but not always the same size.

Mathematical Processes • Problem solving

Grade One:

M(s) • estimate, measure (i.e., by placing non-standard units repeatedly, without overlaps or gaps), and record lengths, heights, and distances.

Video # 2 Activity 5: Extension #1: Creating a Seasonal Math Walk

Materials:

- Parents' Book page 3
- Pens/pencils

Instructions:

1. Divide participants into four groups and assign each group a season.
2. Each group is asked to come up with activities to do on a math walk in a given season. For example:
   Winter - Create and compare snow angels.
   Spring – How many puddles can we find on our walk?
   Summer – How many hands long is my shadow?
   Fall – How many red leaves can I fit in my hand? Or, how many leaves does it take to cover a ____?
3. Participants are encouraged to keep track of the ideas by noting them in the Parents' Book.
4. Each group will share their ideas.

Where's the Learning?

Parents are familiarizing themselves with the scope of mathematics that can be found outdoors. Working in a group improves confidence and increases the variety of ideas. Talking through mathematical thinking enhances understanding.

Video # 2 Activity 6: Extension #2: Tallying

Materials:

- Parents' Book page 4
- Pens/pencils

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Instructions:

1. Leader demonstrates how to do a lumberman's tally by making a diagonal line through four perpendicular lines. A tally sheet is a simple but effective form of record keeping.

2. Participants are asked to walk around the room looking for things that are as long as their hand.
3. They are asked to record them in the Parents' Book at the top of page 4 using a lumberman's tally.
4. Suggest that families use the activity described at bottom of page 4 at home.

Where's the Learning?

Parents practise looking carefully at the environment to find math. They are also familiarizing themselves with the tally system. They may be surprised by how many or how few items they could find.

Video # 2 Activity 7: Extension #3: Walking Stick

Materials:

- A "walking stick" – found or commercial
- Where's the Math Chart from Activity 3

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Instructions:

1. Leader uses a "walking stick" as a prop to demonstrate to participants how to talk about math in the various strands with their families. (The "walking stick" serves as a visual link with the video.)
2. Leader models the questioning and encourages participation. For example:

Number Sense and Numeration – If everybody in our family has a walking stick how many do we need?
If your friend Sam joins us, how many sticks do we need?
If one of the sticks breaks how many do we have?

Measurement – Estimate how many hands long our walking stick is. (Predict, discover , discuss.)
What else could we use to measure our walking stick?

Patterning – How could we place the families' walking sticks to make a pattern. (horizontal, vertical, horizontal, vertical, horizontal….)

Geometry – Use your walking stick to draw shapes in the dirt/snow/sand/mud.

Data Management and Probability – Create examples of probability using phrases such as "I probably could", "Chances are I could not" (With my walking stick I probably could not reach the stars. Chances are that with my walking stick I could reach the branch of the tree.)

Where's the Learning?

Parents are taking one item and relating it to all the strands of math. This gives them another opportunity to recognize the scope of mathematics.
In this activity it is easy to find measurement. It is more difficult to find patterning.
Using the terminology of the mathematics curriculum helps parents become more comfortable in talking with teachers about their child's mathematics education.

Video # 2 Activity 8: Farewell Activity: Walking Pattern

Materials:

- none

Instructions:

1. Leader reminds participants that a pattern is a sequence that repeats. When you do enough of them you will soon be able to predict what comes next.
2. Since this section was about "Math Walks", participants are invited to create their own "Walking Pattern" math walk. For example:
    a. Slide left foot ahead, bring right up beside, slide left foot ahead, bring right up beside
    b. Right foot toe out, left foot toe out, right foot toe in, left foot toe in, right foot toe out, left foot toe out, right foot toe in, left foot toe in
3. Participants work with a partner. One partner demonstrates the "walking pattern" and the other tells what it is. Participants switch rolls.

Where's the Learning?

This activity enables participants to see mathematics and in particular patterning as more than just a pencil and paper activity. It brings math to life in a way that is creative and fun. Yet it reinforces the basic meaning of a pattern. A clear and precise language is required to explain the pattern.

> "The study of patterns supports children in learning to see relationships, to find connections, and to make generalizations and predictions. Understanding patterns nurtures the kind of mathematical thinking that helps children become problem solvers and abstract thinkers. It is problem solving."
>
> N. C. T. M.
> Curriculum and Evaluation Standards for School Mathematics
> Addenda Series – Patterns. 1995

Curriculum Expectations:

Kindergarten:

P4.1 • identify, create, reproduce, and extend repeating patterns through investigation, using a variety of materials *(e.g., attribute blocks, pattern blocks, a hundreds chart toys, bottle tops, buttons, toothpicks)* and actions *(e.g., physical actions such as clapping, jumping, tapping).*

Mathematical Processes • Communicating

Grade One:

P(o) • identify, describe, extend, and create repeating patterns.

Dandelions and Leaves
Math Rap
(from **Family + A Walk = Math**)

Numbers all around the store
And signs with nines and fives and fours.
Bicycle wheels that spin and whirl,
So much math in my world.

Dandelion and fallen leaves
And fluffy clouds above the trees
And sticks all gnarled and swirled.
So much math in my world.

Numbers all around the store
And signs with nines and fives and fours.
Bicycle wheels that spin and whirl,
So much math in my world.

Rectangles and many squares.
Counting up and down the stairs
And how many steps in this one space.
So much math right here in this place.

Math walks happen every day.
On your way to school, or shop, or play.
Stop and point and count and talk.
So much math on any math walk.

So much math in my little world.
Counting and measuring and guessing and how long.
Making a pattern
And singing a song.

Do the Math Walk
Around the Block.
Begin to talk.
Just do the Math Walk.

Words by Judi Waters

Video # 3 Activity 1: Introductory Activity: Estimation

Materials:

- Cloth grocery bag filled with food boxes of various sizes (including one box of crackers). There should be more than 10, but less than 20.
- number line
- blank post-it notes (12.5 c.m. by 7.5 c.m.)

Instructions:

1. Leader holds up the bag and asks participants to think about how many boxes there are in the grocery bag. Stress that we are not counting yet. We are estimating or making our best guess**.**
2. What are some ways that will help us to estimate the number of boxes altogether?
3. Participants are given a post-it note. They place it above the range or zone of their estimated response. The post-it note will cover a range of approximately 3 numbers.
4. Remind families that they want to try to be "in the zone", not have an exact answer.
5. Discuss why the ability to estimate is an important life skill, for example:
   - Do I have enough gas in the tank to get home?
   - Double checking change given by a cashier. Is the amount reasonable?
   - About how much time will this task take? Can I do it now? Or should I wait until later?
6. Continue to stress that we are not counting. We are estimating. Estimating is a very different skill.

Where's the Learning?

Estimating develops a sense of number. This skill is developed through practice and reflection. The more we estimate and the more we think about how we estimate, the better we become. This activity also develops risk-taking, problem solving and the idea that being in the range or zone is the skill required to be a good estimator. Finding a reasonable answer demonstrates an understanding of quantity. The more proficient we become at estimating the smaller the zone or range. Context is also crucial. Sometimes estimating is appropriate as when you put a pinch of salt in a recipe, but when doing taxes pencil, paper and a calculator are essential.

Curriculum Expectations:

Kindergarten:

NS1.6 • begin to use information to estimate the number in a small set
Mathematical Processes • Problem Solving and Communicating

Grade One:

N(s) • estimate the number of objects in a set .

Video # 3 Activity 2: Watching Video: Family + A Grocery Bag = Math

Materials:

- copy of video or on-line connection
- facility for projection to a group

Instructions:

1. A word to the parents:
   Often when we think of math in our everyday world we think of buying groceries and mentally adding up the bill; buying gas and the money required to pay for it. This video will help you see math in places that you may not have thought of before.
2. If appropriate, review purposes of the Family Math video series.
   Family Math Canada has produced a series of three videos to help parents develop in their young children a positive attitude to math through a better understanding of its concepts. Real life activities like reading a book, going for a walk, or emptying a grocery bag are featured in these videos. The videos highlight all strands in the mathematics curriculum.
3. Watch the video.

Where's the Learning?

In this video Measurement, Number Sense and Numeration, and Geometry were highlighted.

Curriculum Expectations:

See Video 3 Activity # 3 for the expectations

Video # 3 Activity 3: Where's the Math Chart: Family + A Grocery Bag = Math

Materials:

- Large laminated copy of Where's the Math chart
- Erasable markers in various colours

Where's the Math?

Strands → / Activities ↓	**Number Sense & Numeration**	**Measurement**	**Geometry and Spatial Sense**	**Patterning and Algebra**	**Data Management & Probability**
Where's the Math - video					
Where's the Math – introductory activity					
Extension #1					
Extension #2					
Extension #3					
Farewell Activity					

Instructions:

1. In this third use of the **Where's the Math Chart** participants can be asked to tell the leader what each strand means For example:
   Number Sense and Numeration - numbers (1, 2, 3, 4, 5, 6, 7, …), and operations (addition, subtraction, multiplication and division), estimating
   Measurement – distance, weight, capacity
   Geometry and Spatial Sense – shapes
   Patterning and Algebra - patterns and predicting what comes next.
   Note: a pattern is a sequence that repeats. When you do enough of them you'll soon be able to predict what comes next.

Data Management and Probability –Explain that Data Management means managing information. It can be through a graph, a number line, a tally sheet or any format that organizes. Include the word "graph" to explain Data Management. Phrases such as "Chances are" and "Probably" show how Probability is used in early math learning.

2. As a group, discuss the video in terms of the math strands that were present. Use a large check mark, or other means, for indicating the major math strand evident, and smaller check marks for the minor strands.
3. Using the terminology of the mathematics curriculum helps parents become more comfortable in talking with teachers about their child's mathematics education.

Where's the Learning?

The families in this video modelled techniques for finding math in a grocery bag. This video can inspire families to look for math in all kinds of places around the home – the fridge, the pots and pans drawer, the laundry hamper. The highlighted mathematics in this video include:

- Measurement
- Number Sense and Numeration
- Geometry

Curriculum Expectations:

Measurement

Kindergarten

M2.1 • compare and order two or more objects according to an appropriate measure *(e.g., length, mass, area, temperature, capacity)* and use measurement terms *(e.g., hot/cold for temperature, small/medium/large for capacity, longer/shorter or thicker/thinner for length)*

Grade One:

M(o) • compare, describe, and order objects, using attributes measured in nonstandard

Number Sense and Numeration

Kindergarten

NS1.6 • begin to use information to estimate the number in a small set *(e.g., apply knowledge of quantity, use a common reference such as a five frame)*

NS1.4 • demonstrate understanding of the counting concepts of stable order *(i.e., the concept that the counting sequence is always the same – 1 is followed by 2, 2 by 3, and so on)* and of order irrelevance *(i.e., the concept that the number of objects in a set will be the same regardless of which object is used to begin the counting*

Grade One:

N(s) • estimate the number of objects in a set

Geometry

Kindergarten:

G3.2 • identify and describe, using common geometric terms, two-dimensional shapes *(e.g., triangle)* and three-dimensional figures *(e.g., cone)* through investigation with concrete materials

DM5.2 • collect objects and data and make representations of their observations, using concrete graphs

Mathematical Strategies • Connecting

Grade One:

G(s) • describe similarities and differences between an everyday object and a three-dimensional figure

Video # 3 Activity 4: Where's the Math Chart: Estimation

Materials:

- Large laminated copy of Where's the Math chart
- Erasable markers in various colours

Where's the Math?

Strands → / Activities ↓	**Number Sense & Numeration**	**Measurement**	**Geometry and Spatial Sense**	**Patterning and Algebra**	**Data Management & Probability**
Where's the Math - video					
Where's the Math – introductory activity					
Extension #1					
Extension #2					
Extension #3					
Farewell Activity					

Instructions:

1. As a group, discuss the activity of estimating the number of boxes in a bag and looking for the math strands that were present. Use a large check mark, or other means, for indicating the major math strand evident, and smaller check marks for the minor strands.
2. Using the terminology of the mathematics curriculum helps parents become more comfortable in talking with teachers about their child's mathematics education.

Where's the Learning?

Estimating develops a sense of number. This skill is developed through practice and reflection. The more we estimate and the more we think about why we estimate, the better we become. This activity also develops risk-taking, problem solving and the idea that there is a range of possible answers when estimating. Finding a reasonable answer demonstrates an understanding of quantity.

Curriculum Expectations:

Kindergarten:

NS1.6 • begin to use information to estimate the number in a small set

Mathematical Processes • Problem Solving and Communicating

Grade One:

N(s) • estimate the number of objects in a set

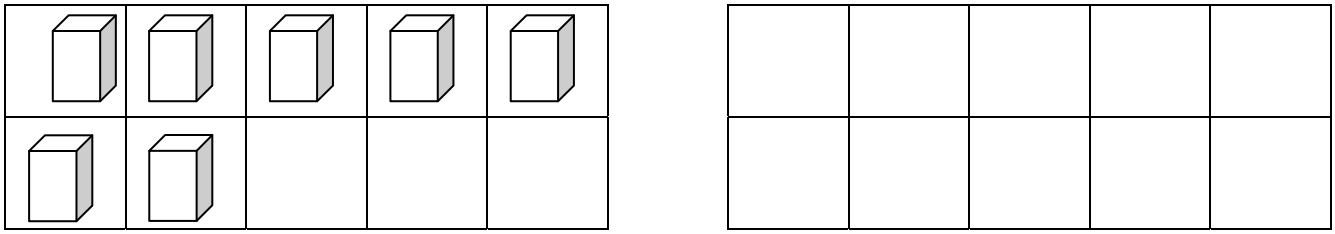
Video # 3 Activity 5: Extension #1: Estimation – The Count

Materials:

- Grocery bag with more than 10 but less than 20 boxes
- Bristol board-sized 10 frame (large enough to accommodate boxes in the grocery bag)

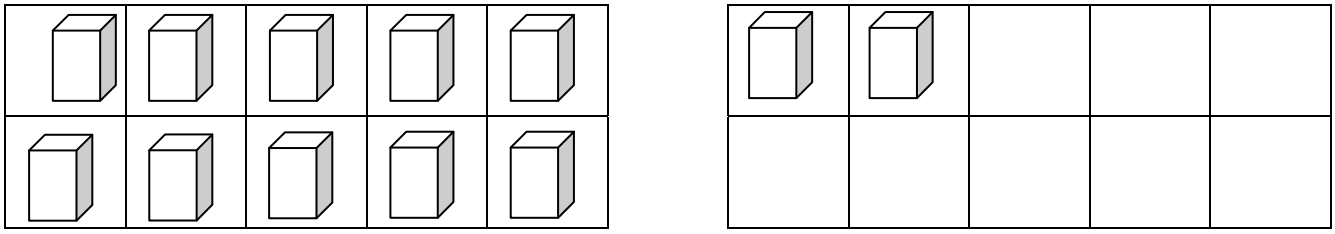
Instructions:

1. Leader briefly reminds participants of the guesses/estimations of the number of boxes they made at the beginning of the evening.
2. One leader takes the boxes out of the bag, one at a time, and places them in the first 10 frame starting on the top left, filling the top row, returning to the bottom left and filling the bottom row (using a left to right progression).



With this number of boxes the leader will say, "How many boxes are there?" How many more would we need to make 10? (Add boxes to the 10 frame to fill it).

3. Leader continues to take the rest of the boxes out of the bag and places them to fill the first 10 frame and then moves on to the next 10 frame.



4. With this number of boxes the leader says, "We have one 10 frame filled. How many is that? How many are in the next frame? How many boxes are there altogether?"

Where's the Learning?

Participants need to recognize the grouping of ten as an anchor or "friendly" number (Think "10 fingers; 10 toes") which is a basic understanding of place value and our base ten system. Participants should discuss the value of the grouping of ten in the 10 frame as well as on the number line.

Celebrate everyone's participation. Reinforce that the more you try to estimate and talk about the strategies you use the better estimator you will become.

A strategy emphasized in this activity is "chunking" - taking a known part to estimate the whole.

10 frames are used in elementary classrooms as a visual mathematics organizer.

Curriculum Expectations:

Kindergarten:

NS1.3 • begin to make use of one-to-one correspondence in counting objects and matching groups of objects *(e.g., one napkin for each of the people at the table)*

DM5.2 • collect objects and data and make representations of their observations, using concrete graphs

Mathematical Processes • Problem Solving and Communicating

Grade One:

N(s) • demonstrate, using concrete materials, the concept of one-to-one correspondence between number and objects when counting

• estimate the number of objects in a set, and check by counting

• relate numbers to the anchors of 5 and 10

Video # 3 Activity 6: Extension #2: Where to Look for Math in Your Kitchen

Materials:

- Chart paper
- markers
- Parents' Book page 5 and 6
- Pens/pencils

Instructions:

1. The group is asked to brainstorm places in their kitchen where they and their children can find more math.
2. Leader can record suggestion on a chart. Participants are encouraged to keep track of the ideas by noting them in the Parents' Book.
3. Refer parents to Parents' Book page 5 for at home kitchen math involving the refrigerator door. On page 6 they will find patterning activities for popcorn and pasta.

Where's the Learning?

Parents are familiarizing themselves with the scope of mathematics to be found in their homes. Working in a group improves confidence and increases the variety of ideas. Talking through mathematical thinking enhances understanding.

Video # 3 Activity 7: Extension #3: Kitchen Towel Math

Materials:

- One kitchen towel for each participant (the towels should have an obvious pattern)

Instructions:

1. Leader asks participants to fold their towel into a geometric shape.
2. Leader asks participants to describe the shape they made using terms such as :
   - Number of corners
   - Number of sides
3. Participants are then encouraged to fold the towel into a different shape and describe it.
4. Participants are asked to find a different strand of math in/on their kitchen towel. If the participants do not come up with "patterning" the leader should draw it to their attention. Be sure to have them name the pattern. For example:
   - Red stripe, white stripe, red stripe
   - Narrow rectangle, wide rectangle, narrow rectangle

Where's the Learning?

In this activity participants are exploring the attributes (number of sides, corners) of two-dimensional shapes and using language to describe them.
It is more important to talk about why it is a rectangle than simply to recognize the shape.

Curriculum Expectations:

Kindergarten:

G(s)17	• explore, sort, and compare traditional and non-traditional two-dimensional shapes

Grade One:

G(s)	• identify and describe common two-dimensional shapes (e.g., circles, triangles, rectangles, squares) and sort and classify them by their attributes (e.g., colour; size; texture; number of sides), using concrete materials and pictorial representations

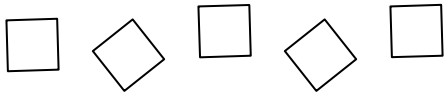
Video # 3 Activity 8: Farewell Activity: Cracker Pattern

Materials:

- Five crackers for each participant
- Parents' Book pages 5 and 6

Instructions:

1. Leader reminds participants that a pattern is a sequence that repeats. When you do enough of them you will soon be able to predict what comes next.
2. Leader opens a box of crackers from the grocery bag and gives each participant five crackers. Participants are invited to create their own cracker pattern. For example:
    - Full cracker, cracker with a bite out, full cracker, cracker with a bite out, full cracker.
    - Square resting on a side, square resting on a corner, square resting on a side, square resting on a corner, square resting on a side.



    - In later years we use the more mathematical term "rotating" instead of "turning". These early math understandings are developed in their child's later math curriculum.
3. Participants work with a partner. One partner demonstrates the cracker pattern and the other tells what it is. Participants switch rolls.
4. If Extension #2 was **NOT** done with the group be sure to refer parents to Parents' Book page 5 for at home kitchen math involving the refrigerator door. On page 6 they will find patterning activities for popcorn and pasta.
5. Wish the participants farewell and invite them to eat their crackers.
6. Hand out participation certificates.

Where's the Learning?

This activity enables parents to see mathematics, and in particular patterning, as more than just a pencil and paper activity. It brings math to life in a way that is creative and fun. Yet it reinforces the basic meaning of a pattern and requires clear and precise language to explain the pattern.

> "The study of patterns supports children in learning to see relationships, to find connections, and to make generalizations and predictions. Understanding patterns nurtures the kind of mathematical thinking that helps children become problem solvers and abstract thinkers. It is problem solving."

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Curriculum Expectations:

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Mathematical Processes • Communicating

Grade One:

P(o) • identify, describe, extend, and create repeating patterns

Math in the Grocery Bag
Math Rap
(from **Family + A Grocery Bag = Math**)

Take the boxes short and tall.
Line them up from big to small.
Then put them away one and all.
Math in the grocery bag.

Boxes and cans short and long.
Put them away where they belong.
Help me sing this kitchen song.
Math (clap) in the grocery bag

All inside the grocery bag
There's cans and boxes and cartons –
Line them up from big to small.
The kitchen math is just starting.

Boxes and cans short and long.
Put them away where they belong.
Help me sing this kitchen song.
Math (clap) in the grocery bag

All inside the grocery bag
There's cans of every kind.
Guess how many, then count them all
In front and behind.

Boxes and cans short and long.
Put them away where they belong.
Help me sing this kitchen song.
Math (clap) in the grocery bag

Words by Judi Waters