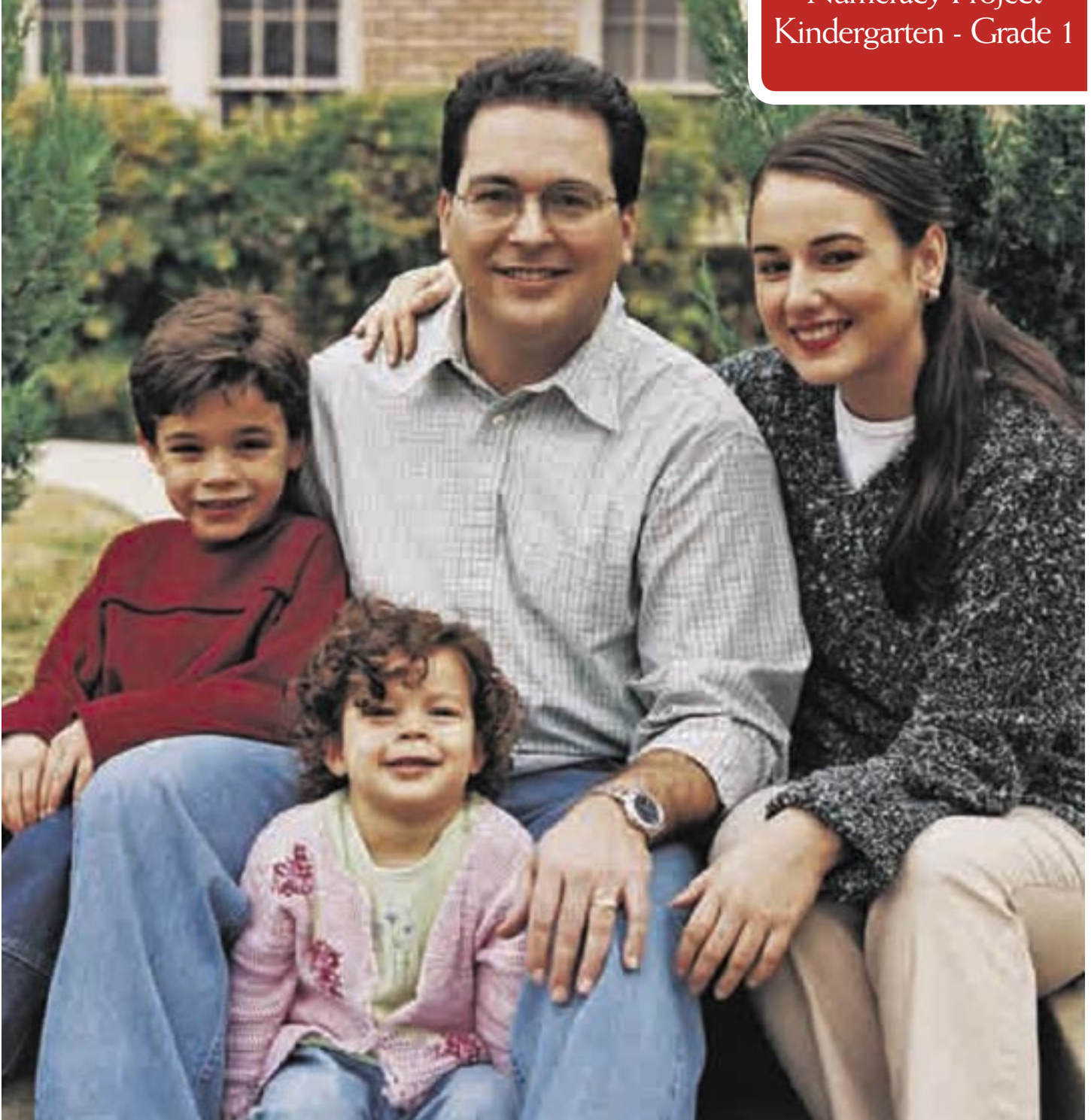


Math For Families

Helping your child with
math at home

B.C. Early
Numeracy Project
Kindergarten - Grade 1



MATH FOR FAMILIES:

HELPING YOUR CHILD WITH MATH AT HOME

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Helping Your Child at Home

Teachers help build children's mathematical thinking at school. Families help build it at home. Research shows that an ongoing partnership with families can help children develop math understanding. This resource suggests ways families can support children's math development by doing activities at home.

Teachers and parents help children view themselves as able learners of math through using real objects and encouraging them to talk about their learning. The following dialogue is an example of how you can encourage your child to talk about math. Encourage your child to tell you about a math activity they bring home and talk about how they did it.



Tell me about your picture.

This is me, Connor. I am doing math.

How do you know how to “do” math? What do you do when you are doing math?

I think about numbers and games. I use dice, cubes, paper and calculators, and talk.

What do you do with those things? How do they help you “do” math?

I can build with them and count with them and play with them. They show me what to do.

Why did you draw talking in your picture?

I am not talking to other people. I am talking to myself, like, “Connor, you can do it.”

Connor sees himself as a math learner, using real objects and self-talk.

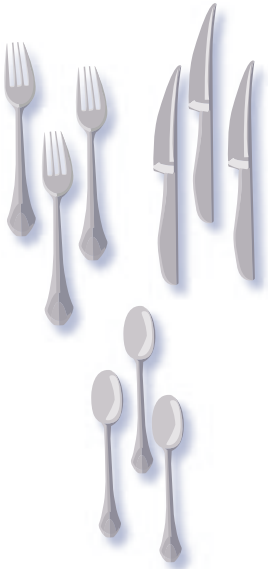
1 | Math Everywhere

Children need to know that math isn't just something they learn at school. Math is everywhere. Have fun with math, talk about it and help your child be aware of math in everyday life.

Have Fun with Math

- > Play games together (including board games and computer games). Talk about what makes games fun, what makes them hard, and which games your child would like to play again.
- > Look for toys that encourage your child to think creatively (building blocks and construction toys).
- > Play card games, board games or dice games. These games can add to family fun.
- > Cuddle up and read books together – talk about the ideas related to numbers, space, time and money.

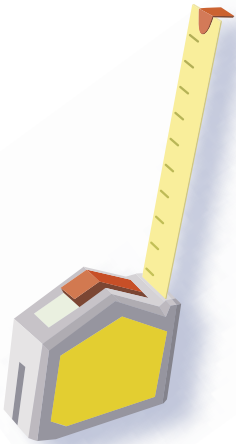
Talk about Math



- > Ask questions that encourage your child to:
 - use math language, including words such as add, subtract, equal and the names of shapes;
 - explain his or her thinking; "Tell me how you know that" or "How did you get that?";
 - sequence and plan; "What are you going to do first?";
 - count; "How many buttons are on your shirt?";
 - compare; "Which leaf is biggest?";
 - use logical thinking; "There are four kids coming to the party. How many treats do we need?";
 - describe the world; "What shape is the moon?";
- > Talk about math as you show your child how you use math in your life. For example, to:
 - measure for recipes, sewing, and woodworking; "I need one cup of sugar";
 - estimate amounts of paint or wallpaper or to hang pictures; "I want to put this picture 10 centimetres above the other one";
 - use the clock to be on time or plan ahead; "If the party is at five o'clock we need to leave in half an hour";
 - read schedules for television, bus or movie times; "The movie starts at seven o'clock, so we'll be home before bed-time."

Promote Math as Thinking, not Memorization

- > Praise your child when she thinks for herself, or when he figures things out by himself; "Great job using a new way to figure that out."
- > Try not to emphasize memorizing. Although some parts of math need to become automatic through memory work, children need time for mathematical thinking and reasoning – don't rush it; "Take your time."
- > Ask your child to explain how he figured things out, what she was thinking. This helps children realize that you value their thinking; "How did you know that?"
- > Keep in mind that memorizing does not always mean understanding and that math is about making sense.



Model Positive Attitudes Towards Math

- > Have fun together while doing math-related activities such as measuring ingredients for cooking, counting out dishes or cutlery for table setting, sorting laundry, building projects, working with tools, or sorting the recycling.
- > Encourage your child to be curious about how things work; "I wonder if . . ."
- > Model the old adage "try, try, try again!" Develop persistence and flexibility in thinking by encouraging and allowing many ways to approach a problem; "Can you think of a different way to put the shapes together?"
- > Spend time talking about your positive math experiences in school and life. Children are often influenced by the attitudes of the adults around them; "When I was a kid I used to love playing card games too" or "Math can be hard, but if we keep trying we'll get it."

Children Develop Mathematical Understanding at Different Rates and in Different Ways

- > Choose activities where children can have some success, see some progress, and have some fun. Make sure games and activities are something they can succeed at doing and aren't too hard.
- > Provide materials for children to support their thinking (such as pennies or blocks to model and count). Abstract thinking develops slowly and depends on this multi-sensory experience.
- > Watch how children use their fingers to support their thinking. Ask them to explain how their fingers help them. They will drop the use of fingers once their thinking is internalized.

By asking children to explain their thinking, teachers and parents help children realize that their thinking is valued.

2 | Activities for Every Day

Young children learn best through working with objects and by having "real" experiences. Real experiences are those that can happen naturally while doing day-to-day activities around the house and in the community. Children need to make sense of math by doing, seeing and talking about mathematical connections with their lives. Children who learn to make sense of math in this way build a strong base in working with numbers.

Estimation

Estimation is using what you know to make a guess that makes sense. Estimation is an everyday skill.

> Questions to Ask

- How do you know?
- Does that make sense?
- If you don't know, how can you find out?
- Is there another way to find out?
- How many _____ do you think there are?
- Which one has most, is longer, is heavier?

> Things to Do

Estimate first and then find:

- something that is longer, shorter, lighter, heavier, than _____
- how many crayons end-to-end would go from the couch to the fireplace
- how many blocks will fit in this box
- which will take longer, to walk to the door or write your name
- how many minutes before your food comes after you order
- how many pennies it will take to cover a book

Patterning

Patterning is seeing repetitive cycles, events and images that are predictable.

> Questions to Ask

- How do you know?
- Does that make sense?
- If you don't know, how can you find out?
- Do you see a pattern? Tell me about it.
- What will come next?



> Things to Do

- Look for repeating patterns on cloth, wallpaper, or clothing.
- Look for repeating patterns in time (e.g., seasons, months, or daily routines).
- Listen for patterns in songs and clap or dance the rhythm.
- Start patterns with blocks, beads, playing cards, or toys and get children to make them longer.
- Count by 10's, 5's, and 2's.

Counting and Numbers

Numbers are all around us and we need to know how to use them.

> Questions to Ask

- How many are there?
- How do you know?
- If you don't know, how can you find out?
- Does that make sense?

> Things to do for Counting

- Let your child see and hear you counting.
- Count everything – touch each thing while counting.
- Use number rhymes and songs.
- Set the table. Ask: How many forks are needed?
- Play board games.
- Play dice games. Have the children say the numbers.

> Things to do for Numeral Recognition

- Play card games.
- Find numbers on signs, in newspapers (e.g., find all the 3's).
- Use magnetic numerals.
- Make play dough numerals.

> Things to do for Sorting

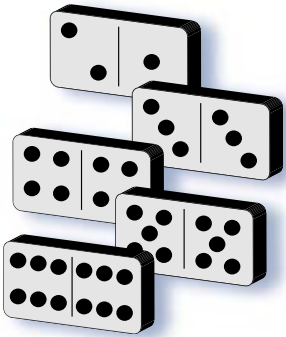
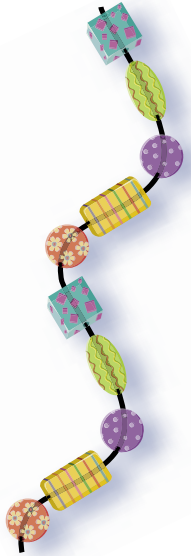
- Sort the laundry.
- Put away the cutlery and toys.
- Arrange books (e.g., sort by size or subject).
- Collect items to use for sorting (e.g., buttons, rocks, nuts and bolts, or beads). Sort them using muffin tins or egg cartons.
- Sort playing cards or dominoes.

> Things to do for Ordering—size, height, length, number

- Use nesting toys.
- Ask which flower is the tallest or shortest.
- Order various materials by length, volume, size (e.g., ribbon, buttons, lids, pieces of paper).
- Use playing cards or dominoes.

> Things to do for Number Concepts

- Find out how many ____ there are (e.g., doors in your house, red cars on the street, cups on the table, red lights on your trip to the store).
- Tap your finger ____ times and have your child tell you the numeral or point to the number on a numeral card.
- Make groups of 3, 4, 5, 6 things.
- Make "8" as many ways as you can (e.g., 4 and 4; 5 and 3; 2 and 6).
- Match numeral cards with the correct number of things (e.g., numeral 8 card with 8 objects).
- Look at dominoes and find all the ones that have a total of ____ dots.



Spatial Thinking

Understanding where things are in our world and how they relate to each other helps us make sense of our world.

> Questions to ask

- What do you see?
- What would happen if _____?
- Can you tell me why _____?

> Things to do

- Recognize dot patterns on dice without counting them (e.g., let children call out the numbers on the dice).
- Conduct a shape search playing "I Spy"; "I spy something that is round."
- Build with blocks. Make designs with shape blocks.
- Play shape tickle (e.g., draw shapes on your child's back so that she or he can identify them).
- Play with puzzles and games involving fitting shapes into a space.
- Make jigsaws using pictures and then put them back together.
- Make a map of your bedroom, your house, or your neighbourhood.
- Practise position words by having a treasure hunt—follow clues like over, under, above, below, next to, beside.
- Put cutlery into the right space in the tray.

3 | Math for All Seasons

The seasons give children many opportunities to explore math with things they understand and are interested in. Encourage them to notice seasonal patterns by asking questions such as:

- Is it getting lighter or darker at bedtime?
- How do the plants change this time of year? What will happen next?
- Is it colder or warmer today? How can you tell?
- Is it likely to be colder or warmer tomorrow?

Involve them in planning a seasonal party or special event:

- Ask them how long it is until a special day.
- When buying gifts ask them what kind of gift they can buy for various amounts of money.
- Sort gifts by size (volume) or weight (mass).
- When wrapping gifts, ask: How much wrapping paper do you need? How much ribbon will you need? Will the gift fit in this box?

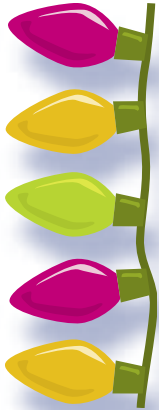
Fall

> Ask how many days your child has been in school.

> Play with leaves:

- Sort leaves by shape, size, and colour. Count each group.
- Compare groups of leaves. Ask which has more or less or the same.
- Use string to measure around the leaves.
- Ask your child to find a leaf that is the same size as your hand, bigger than your hand, or smaller than your hand.
- Ask how many leaves your child thinks he or she can hold in one hand (estimate).

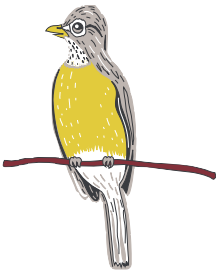




- > Use pumpkins:
 - Ask which pumpkin is heaviest and which is the biggest around.
 - Cut shapes in a jack-o-lantern.
 - Order pumpkins by size (e.g., largest to smallest, least amount of green to most amount of green).
 - Count the seeds together.
- > Sort Halloween treats:
 - Sort the ones you like and don't like.
 - Put the treats into groups (e.g., shapes, sizes, chocolate or chips).
 - Ask your child to take one group and make it into two different groups.

Winter

- > Ask your child how many days he or she has been in school.
- > Ask how long until winter break.
- > Look for patterns in seasonal lights. Ask which colour they see most often.
- > Take advantage of the snow or rain:
 - Ask how much water or snow your child thinks has fallen today.
 - Talk about choosing the right size of boot or coat or mitten. Ask which will fit.
 - Build a snow fort. Talk about the different shapes.
 - Ask how many days were sunny this week and how many days were rainy.
 - Ask about puddles: "How deep is this puddle? Which puddle is the deepest? Which puddle holds the most water?"
 - Make a path in the snow to a car or tree or sidewalk. Ask how many boot prints it took.
 - Compare and order snowballs by size.



Spring

- > Listen to bird songs. Ask: "What patterns do you hear? Can you repeat it?"
- > Count birds and sort seeds.
- > Compare different plants by asking which seed they think will grow into the biggest plant.
- > Measure plant growth. Ask if this plant will grow higher than your knee.
- > Choose a vase to put flowers in.
- > Have your child throw a baseball. Ask how many steps away the ball is.

Summer

- > Ask your child to guess how far he or she can run while counting to 20.
- > Ask your child to estimate how many steps to the playground.
- > Measure the longest throw or the furthest kick by number of steps. Ask your child how else you could measure.
- > Ask your child to look for patterns in shells, beach balls, and beach towels.
- > Ask how many scoops of sand are in one pail.



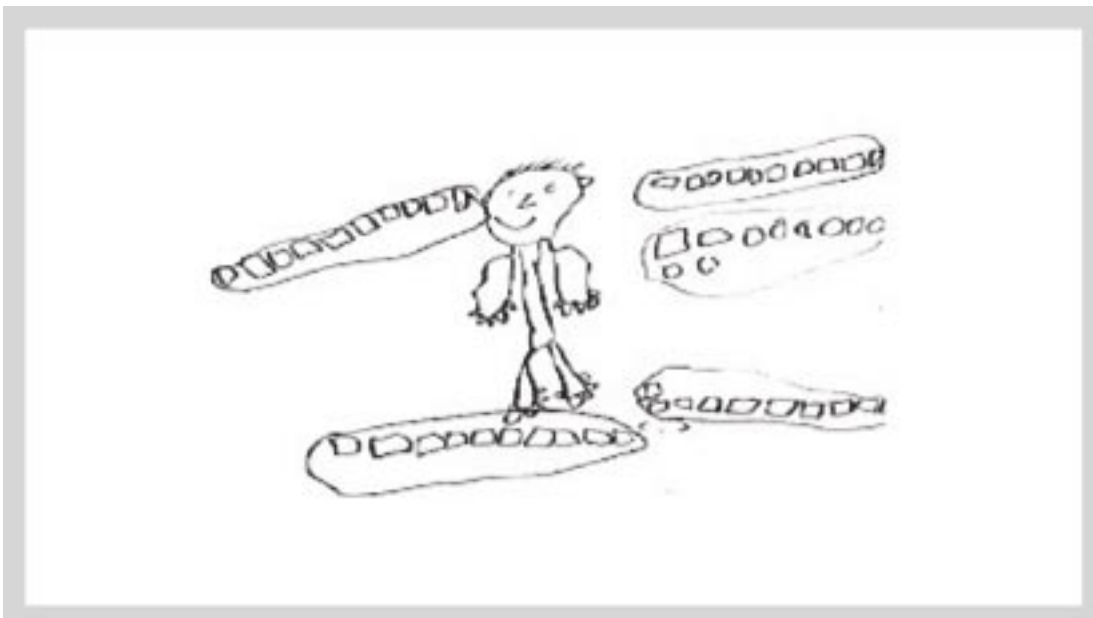
- > Ask your child to sort shells in different ways and tell how they are sorted.
- > Arrange shells in patterns. Ask what comes next.
- > Have your child draw and copy patterns in the sand. Ask what comes next.
- > Ask your child if there are more people in the water or on the beach.

4 | Creating a Rich Math Environment

Creating a rich and positive math environment at home and at school is important to children's numeracy success. A rich mathematical environment:

- > promotes confidence and helps children believe they can "do" math
- > helps children feel safe about taking chances
- > uses activities that can be approached in many ways
- > gives children a chance to practise what they have learned
- > allows children to explore
- > uses good questions to develop reasoning in children
- > encourages children to talk about and show their thinking
- > supports children to use what they know to learn new ways and ideas
- > accepts use of different strategies, not just one way
- > respects that children need time to develop their mathematical thinking.

Young children learn best through working with objects. Experience with real objects helps them picture math ideas in their heads.



5 | What Is Numeracy?

Math games on the computer are most successful when played with a parent present to talk about concepts and verbalize thinking.

Numeracy is the ability to make sense of math and to use it effectively in real life situations. Numerate people:

- > can use what they know to figure out what they don't know
- > can use reasoning and evidence to prove a point
- > can explain what they are doing as they work with numbers, symbols, and geometric objects
- > know which processes to use to solve problems and can tell why
- > can talk about their ideas and show their thinking.

6 | Numeracy Websites

There are many websites for mathematics games. The following websites can help children develop mathematical understanding.

www.ed.gov/pubs/parents/LearnPttrs/math.html

This website is called "Learning Partners – Let's Do Math" and is full of games and activities to do at home within everyday activities.

www.kidsdomain.com/games/math2.html

Contains about 20 games for young children focusing mainly on counting and numeral recognition. Also has a section for older children.

www.eduplace.com/math/brain

This website introduces a new problem-solving brainteaser every Wednesday. Begins at a Grade 3 level and is suitable for any primary children who are ready for challenging problems.

www.Mathstories.com

An excellent source with a wealth of story problems for grades 1-5. NCTM (National Council of Teachers of Math) and CGI (Cognitively Guided Instruction) approved website. There is a registration fee to use this website.

www.mathbrain.com

Includes games such as Math Baseball. This site allows you to select a game by age level.

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