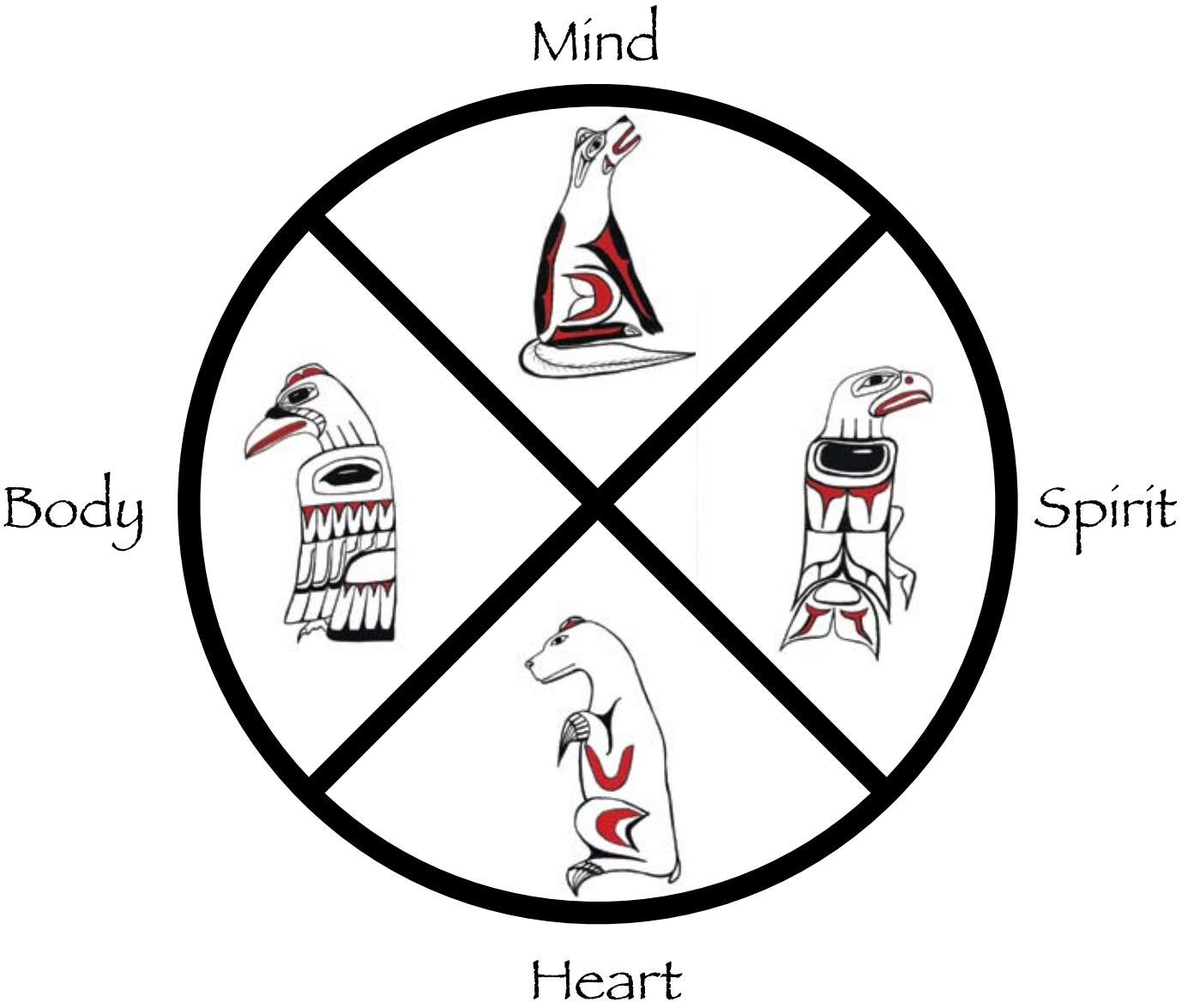
Introduction

We are all born with a learning spirit, and when we love and care for children, we want to keep their learning spirits alive and well. The activities in this book are designed for families to do together. All the activities will help children learn to think about numbers and shapes and patterns—that is, they will learn to do "math thinking." But besides the mind, the activities involve the spirit, heart, and body.

Spirit: We want to nourish the learning spirit, so that children become aware of themselves as learners. Activities such as counting out plates for dinner help kids feel that they belong to the family and contribute to family life. They develop a sense of themselves as people who can solve problems. Looking at shapes, numbers, and patterns in nature makes them aware of the beauty and order that surround them.

Heart: When adults do these activities with children, the children feel loved. When the children are successful at the activities, they feel confident and happy to take on another challenge. When the activities contribute to family life, children feel responsible, and proud of their ability to take part.

Body: The activities here all involve doing something. It is not enough to think about things. When you do something in the real world, there is usually a reaction—someone or something does something back. The reaction teaches you something, and you may begin to think in a different way because of it. Sometimes we can't think of what to do, but something says, "Just try this…" and we do, and it works.



The Teachers of Gifts by Harold Joe, Sr.

Mind: When we think of math, we often think of school math, but children begin to notice and think about numbers from the time they are born. The activities in this book all involve math thinking without worksheets or tests. Making a collection, taking a bath, making a box, braiding your hair, making art—if you do any of these things, you are thinking mathematically.

Spirit, heart, body, and mind are all connected in our lives, and they are connected in the activities in this book. Math is not "all in the head." When we keep it only in the head, we are out of balance, and cannot do it well. When we balance the spirit, heart, body, and mind, math becomes part of our whole lives, and is not a beast or a barrier.

Three Audiences

This book has three audiences: (1) parents, childcare workers, pre-school teachers, and elementary school teachers—people who work directly with children; (2) facilitators of parenting groups, strong start programs, and family literacy programs—people who work with parents and children together; and (3) Adult Basic Education instructors and tutors who teach basic math to adults. The following sections speak directly to each of these three audiences about how to use the activities in this book.

People Who Care for Children

This book is for people who want to help little kids get ready for school math. It is for people who want to help school kids get better at math, and feel better about it. This book is for parents, grandparents, and foster parents; for people who babysit or do day care; and for teachers. It is for anyone who spends time with kids. Maybe this book is for you!

How can I help?

Maybe you were not good at math yourself. Maybe you hate math, and try not to do any! Yet you see a kid you care about having the same troubles that you had, and you worry.

Maybe you always liked math, and were good at math at school. You want to make sure that your kids have the same good time with math.

Maybe you weren't good at math in school, but you figured out on your own how to do the math you need in your life. Maybe you are proud of the way you figured it

out, or maybe you worry that your way is not good enough.

Whatever you know about math, and however you feel about it, you can help the kids in your life get ready for math, and get better at it. This book will show you some ways to help.

Play is important

You don't need to become a school teacher to help your kids with math. Kids who are in school already have a teacher. That is not your job. You can help by talking and using numbers when the kids are around, inviting your child into activities you do that use numbers, and encouraging thinking and talking about the world around us. You can help connect the math we do every day with school math.

Little kids don't need a teacher. They need to play. When they play they learn. You can help by encouraging them to play. You can help by following their play where they want it to go, not by leading it where you want it to go.

Give them lots of things to play with

These things don't have to cost much. A few plastic tubs from margarine or chip dip in the bath tub can teach kids a lot about bigger and smaller, and about how much different shapes can hold.

Let them sit and watch an ant hill for as long as they want. There will be chances to count ants, to notice that some are bigger or smaller, to notice that some are different colours, and to notice which way they go and how fast or slow they move—many patterns, many things are different, many things are the same. Noticing and finding patterns are math skills.

If your kid isn't interested in ants, but likes beads, the same kind of math thinking can be done with beads—sorting, counting, noticing, finding patterns. You can follow the kid's interests, and help learning by asking questions such as: How many? How many big ones? How many red ones? What patterns do you see?

Keep it real

Let your kids in on the things you do that use numbers. Let him put a plate on the table for every person. Let him put out the forks to match the plates. Let him pay for things himself, and get the change. Take the time to let him take part in real life.

When things are real, they matter

Kids can count to put the forks on the table, or they can count to put stickers in a book. The counting is the same, but the feeling is different. Making sure that there is a fork for everyone in the family is more important than putting stickers in a book, and your child knows that. Let him be proud to help and to be a part of the family.

When things are real, you know when you get it right

When a kid is counting out forks for dinner, it's easy for her to see when she gets it right or wrong. When she sees that everyone has a fork, she knows she counted well. If someone doesn't have a fork, she knows she made a mistake, and can fix it easily by going to get another fork. If she makes a mistake in a workbook, she can't tell if she's right or wrong; if you tell her she's wrong, there is no reason to fix it.

Let them make mistakes

When kids are learning to talk, they make lots of mistakes, and no one cares. A 3-year-old child will say "pusketty" instead of spaghetti for a long time, and no one gets worried. Most people think it is cute. Some parents start to say "pusketty" too, just to keep the kid company. Some parents are careful to say it correctly so the kid hears it the right way many times. After a while, some parents help the child to say it correctly; other parents just wait until the kid grows enough to be able to say the "sp" sound. But everyone agrees it's normal to make mistakes when you are learning to talk.

In the same way, when a kid is learning to count, he will make lots of mistakes. Sometimes he starts at 5 instead of 1. Sometimes he counts the same thing twice;

sometimes he misses one thing; sometimes he gets the numbers in the wrong order. All this is normal, so don't worry about it. You don't have to correct him. Be glad that he thinks counting is fun.

How a child learns to use math

Math is a tool we can use to solve all kinds of problems. How many hot dogs should we cook for a crowd? When should I leave home to get to school on time? What is the best way to arrange things in my closet?

You want your kid to learn how to use math as a tool. You want your kid to be able to solve some problems for herself. Four steps will help your kids learn to use math to solve problems: notice, think, do, talk.

Notice

Kids are born to pay attention to what goes on around them. That's the way they learn. Sometimes kids learn to shut down, and then it's hard for them to learn new things.

How can you encourage your child to notice what's going on? Pay attention to whatever he pays attention to. Show you are interested by smiling or asking a question. Tell him that you have noticed the same thing, or that you have noticed something else.

Think

A child will think about things she notices. Why is it different today than yesterday? Why won't the door close? How did that happen? Where did it go? When will it all change?

How can you encourage your child to think? Give her lots of chances to see and hear and play in different places and with different people. Don't give her all the answers—let her think and come up with her own answers.

Do

A child has to do something besides thinking to solve a problem. He has to decide what to do, and then he has to do it and see what happens.

Then more noticing and thinking goes on. Did it work the way he wanted? Is he on the right track? Did he solve the problem?

How can you encourage your child to do something about a problem?

First, find him a safe place to play, so he can move and take things apart and put them together without hurting himself. Then let him do it. Notice what he is doing. Use your words to talk about what you see him doing. Don't tell him what to do, just notice the directions he's going in.

Talk

When your child talks about what she has done to solve the problem, it gives her words to help her think some more. It gives her words to help her remember. It gives her words to help her understand.

How can you encourage your child to talk?

The most important thing you can do is listen.

Activities to do with kids

You will find lots of things to do with your kids in the pages that follow. You know what your kids like to do. Pick some activities that you think you can have fun with, and that your kids will like to do. You can do them in any order.

The activities start on page 12.

Books, DVD's and websites

The lists start on page 101. Have fun reading, playing games and watching the DVD's with your kids.

People Who Work with Parents

If you work with parents who want to help their kids succeed in school, you can use the activities in this manual with your group. The goal of the activities is to help parents nurture their children's math thinking and working, and to develop children who love math, who can solve problems in daily life by using numbers, patterns, and shapes, and who are confident in their abilities and proud of their contributions to family life.

Aboriginal parents made up the majority of people who tested the activities, and the manual was designed to include them and their children.

You can use the activities in any order. The activities are grouped in themes to make it easy to find material to interest the group you are working with. Each activity has variations to take into account different levels of math skill and other abilities.

Instructions and supporting materials for parents are written in plain English so that even those parents who may not read or speak English well can use them. There are three kinds of material for parents here:

1. The material in the preceding section of this introduction.
2. The supporting material and directions for doing the activities that make up the main body of this manual. You can decide how much, if any, of this material to make available to the parents in your group.
3. The material designed for parents to take home after a group session. This may be a pattern for building something or a game board or score sheet for the game they have learned in the group, or a full-page poster designed to go on the fridge to remind parents of the highlights of the session.

Working with parents who hate math

Many parents do not have good math skills and/or do not feel confident about their

skills. They are often reluctant to come to a "math group," so it may be better to include some of these activities as literacy activities, then talk about how they are designed to teach math, too. When parents are comfortable with that, begin to use the label "math activities" if you like.

Set up a safe, supportive atmosphere where there is no "right" answer. In the groups that tested these activities, many parents commented on the importance of seeing that there were many ways to do something, many ways to get an "answer." Knowing that took away the stress they usually felt about math.

Parents need time to do the activities themselves before they work with their children. They need time to figure out what to do so they can be confident about the procedure when they work with their kids. They need time to enjoy doing the activity so they can appreciate their child's pleasure in it; they need to be surprised themselves by how things turn out so they can be motivated to let their kids discover the surprise.

As you work with parents and children on these activities, you can model confidence building and "scaffolding" of skills. Two concepts are behind all of the activities included here. First, every parent and child can find a way to do the activities that is right for them. When the parent and child find their way to a successful outcome, it builds their confidence to do it again in another situation. Parents begin to see how they can work with the child to increase the child's self-confidence, not by praise but by the child's own sense of accomplishment.

Second, parents support their child's learning by building a scaffold to support them as they learn new skills, which means following the child's lead in play. For example, the parent does not decide, "Today I'm going to teach one-to-one correspondence of number to item." Rather, the parent notices that, in play, the child is sharing 5 candies out to 5 stuffed toys, or making a series of trips with a toy truck, carrying 1 big block at a time to the other side of the rug. The parent offers a question or a comment that helps the child notice that having 5 candies and 5 toys mean that every toy gets 1 candy; or that moving 3 big blocks means 3 trips across the rug.

We are "scaffolding" the child's learning when we see that he is building a tower of blocks that is getting shaky as it get higher, and we put our hands around the tower

as he puts another block on top. We are not building the tower for him, but we are making sure that his lack of dexterity in placing the latest block does not destroy all the work he has done so far. We know our child, so we know what kind and how much support he needs; we give him that support so he can do what he wants, and learn what he needs to learn.

Adult Basic Education Instructors

Many students who come into an Adult Basic Education (ABE) program at a very basic level have already done whole numbers and decimals and fractions many times. They are placed in a fundamental class because they don't understand the concepts or don't remember how to do the problems, but they resist doing more work at this level. "I've already done that," they say, and either drop out or settle down to do many more pages without doing any more thinking than they did before.

Other students, although not so fixated on the idea that they have already completed the work many times, still feel uncomfortable and resist using manipulatives or doing any activities that they consider to be "not real math," such as field trips, real-life problems, group work, and measuring.

The material in this book offers a new way to reach such students, if they are parents or act *in loco parentis* to grandchildren, nephews, nieces, or younger brothers and sisters. Talking and learning about how children learn math (see the introduction for parents, above) bring a different subject into your math classroom, which they have never had before. Choose activities that deal with concepts you are teaching in the class. Prepare the students to use the activities with their kids by doing the activities in class. You can discuss the concepts behind the activities, stress the likelihood that their kids will surprise them with a different way of thinking or doing the problem, and assure them that lots of ways to think about math are okay. If the parents in your class have kids with a range of ages, start at the most basic level, and go up to an elementary school level on the concept so that your whole class gets ready to teach the activities on many levels.

Ask them to do the activities at home with the kids, and then discuss it in the following class. What happened? How did their kids surprise them? What showed them that the kids understood the concept? What misunderstandings happened?

What evidence was there that the kid didn't understand? All these questions will help your students think about, talk about, and do the math in your class.

Ask them to preview the books and DVD's listed in the appendices. Which would they recommend? Then ask them to check out their recommendations with their kids.

A Math Kit for Parents

In order to do the activities at home, parents need the following items. The parents who tested the activities received a kit at the beginning of the program, so they could make use of them at any time.

- a pair of good scissors for adults
- 2 decks of cards
- a set of 5 dice
- a glue stick
- a few brads for holding sheets of paper together to make a book or a play clock
- a pack of score cards for "Roll Them and Win"
- a tape measure
- a set of measuring cups and spoons
- graph paper

Additional items would be useful: a Rumoli game with poker chips, a set of scissors for children's use, felt pens, and a set of shapes such as pattern blocks, available from many teacher supply stores or online at http://www.arteleducational.ca/index.php.

Resources

Appendices B, C and D are lists of books, online links and DVD's for kids of all ages.