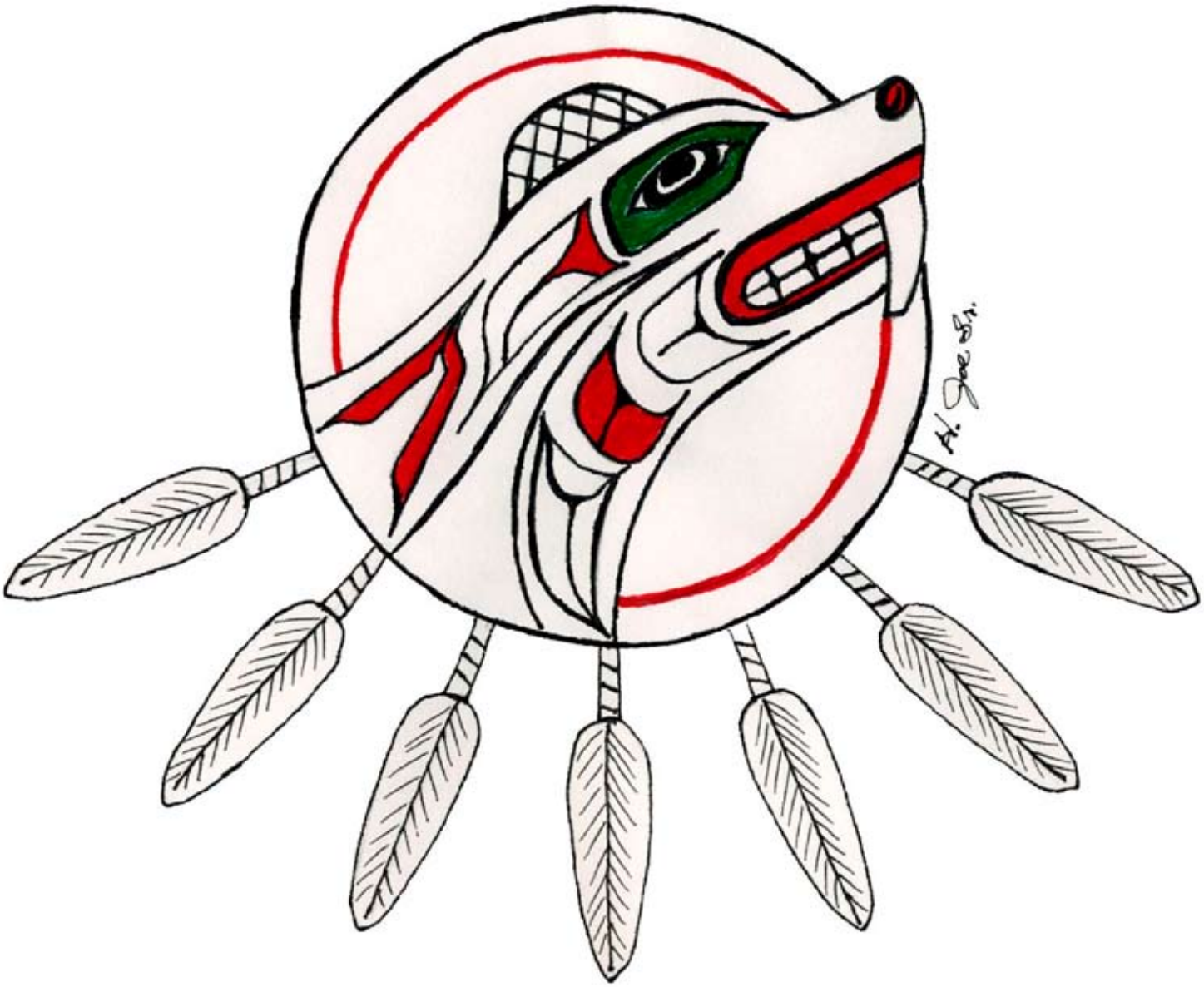

Family Math Fun!

Kate Nonesuch

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Copyright Notice

We have made every effort to ensure that the songs and rhymes in Activity 1 are in the public domain. If an inadvertent breach of copyright has been made, please notify us and we will correct any omission in future editions.

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All other art © Bobbie Cann and Christina Taylor

Text © Kate Nonesuch

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Many parents, grandparents, and big brothers and sisters in the Cowichan Valley tested the activities in this manual. Many of them met with me a couple of times a week for many weeks. They thought about kids and math, and observed the kids in their lives between meetings. I thank them for showing me what worked and what did not, and for talking to me about their kids and their own math histories. I appreciate the generous gift of their time and their enthusiasm. This manual could not have been done without them. Here are their names:

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The Beaver

Harold Joe, Sr., from Somena on Vancouver Island, made the art on the cover.

He chose the beaver because the beaver is a hard worker that never stops caring for the lodge and the family. When the pups are young, the parents start to teach them. The pups learn to be beavers—a way of living and working. Beavers take good care of their cubs, and are good teachers. The beaver stands for family togetherness.

The beaver uses determination and creativity to build houses and dams. It can do things that we would use math to figure out, such as: How many trees will it take to build the dam? How thick will the walls need to be to stand up to the water pressure? How can we build a roof that doesn't cave in?

The old people learned how to build houses by looking at beaver lodges. Harold says, "We learn from every animal. We honour every animal."

The circle in the design stands for the life of the present and a connection to the beyond. Voices heard from the elders are passed along.

The hanging feathers stand for each reservation of the Cowichan Tribes: Somena, Koksilah, Quamichan, Comiaken, Khenipsem, Clem Clem, and Tl'ulpalus.

The colours also have a meaning: red stands for strength, black stands for protection, and green stands for peace.

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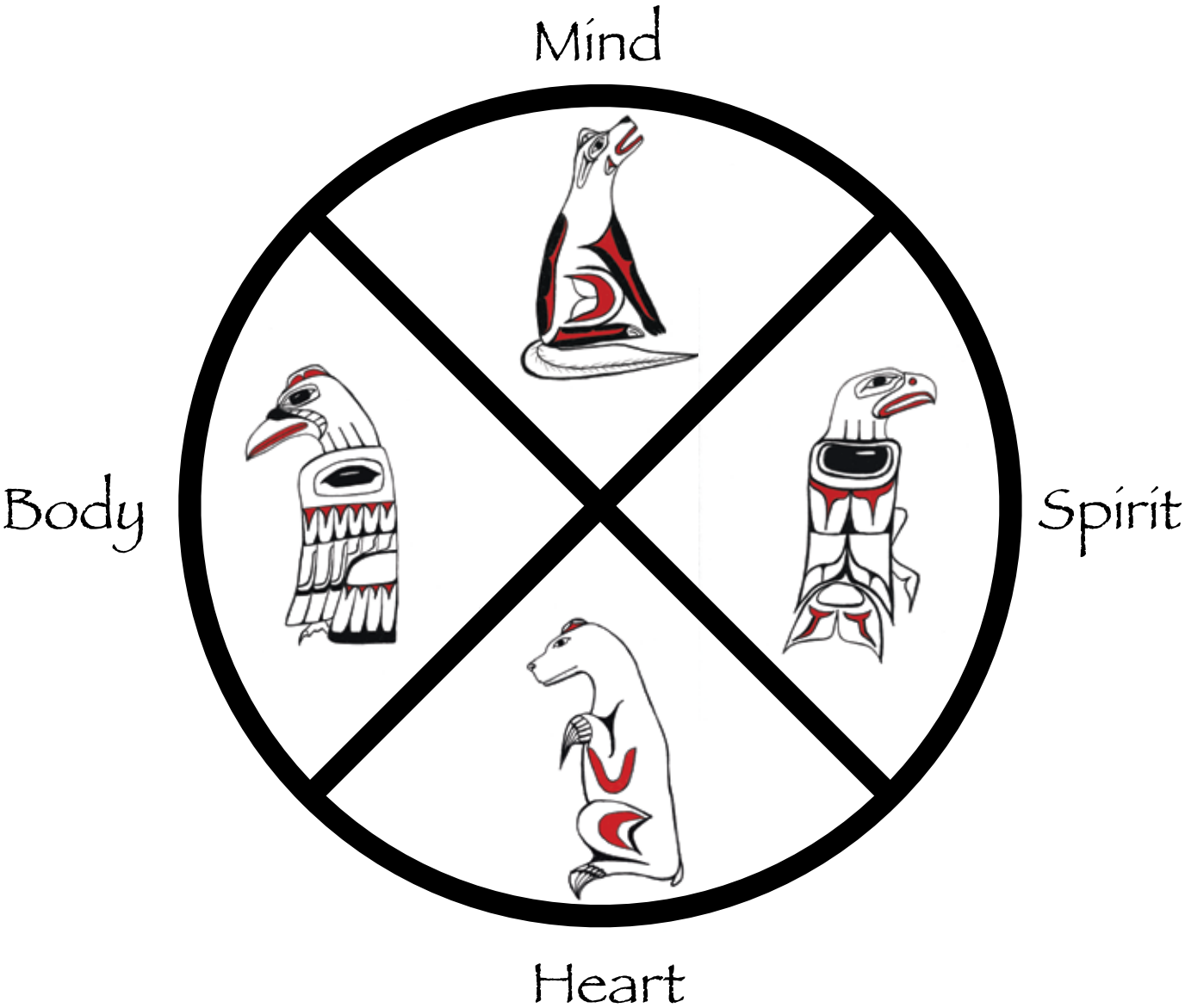
Introduction

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.

Songs and Rhymes

Activity 1 Learn a Rhyme or Song

Rhymes and songs are good ways to have fun with kids and teach them to count. The most important thing is to have fun. Most of the rhymes and songs that follow are old, and you may know them with different words or actions. Use them whichever way you like.

This Little Bear

This little bear went fishing.
This little bear stayed home.
This little bear caught a salmon.
This bear caught none.
This little bear said "Grr, grr" and ate it all up.

Hold the baby's foot and wiggle each toe for each little bear. The last line is time for a little tickle.

Two Little Eyes

Point to the baby's eyes, ears, nose, and mouth, or to your own.

Two little eyes to look around,
Two little ears to hear each sound,
One little nose to smell what's sweet,
One little mouth that likes to eat.

Here Is the Beehive

Here is the beehive. *Hold up your closed fist.*
Where are the bees?
Hidden away where nobody sees. *Open your fist, one finger at a time.*
Here they come buzzing out of the hive--
One, two, three, four, five!

Fish

One, two, three, four, five…
I caught a fish alive.
Six, seven, eight, nine, ten….
I let it go again.

Wrap your fingers around the baby's hand or foot, one finger at a time as you count to 5.

Then unwrap them one finger at a time as you count to 10.

One, Two, Tie My Shoe

One, two, tie my shoe,
Three, four, shut the door,
Five, six, do some tricks,
Seven, eight, stand up straight,
Nine, ten, start over again.

Do the actions for each line. When you get to the third line, some "tricks" might be to spin around, or jump, or pat your belly and tap your head, or whatever tricks you can think of.

When you are tired of starting again, change the last line to "Nine, ten, that's the end."

This Old Man

Knock on the place mentioned in each verse, when you say "knick-knack" on the third line, knock, then clap for "paddy-whack," and pretend to give the dog a bone.

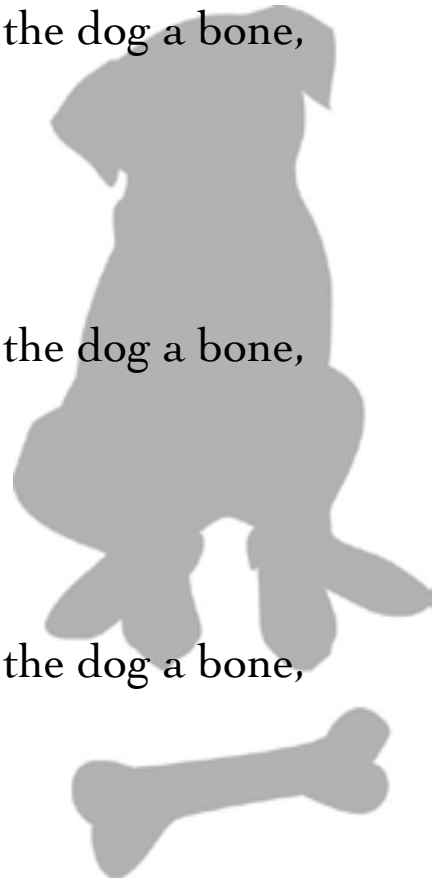
This old man, he plays 1,
He plays knick-knack on my thumb.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

On the last line, roll your forearms around each other.

This old man, he plays 2,
He plays knick-knack on my shoe.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 3,
He plays knick-knack on my knee.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 4,
He plays knick-knack on my floor.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.



This old man, he plays 5,
He plays knick-knack while he does a dive.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 6,
He plays knick-knack with some sticks.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 7,
He plays knick-knack 7 to 11.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 8,
He plays knick-knack at my gate.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 9,
He plays knick-knack on my spine.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

This old man, he plays 10,
He plays knick-knack over again.
With a knick-knack paddy-whack, give the dog a bone,
This old man goes rolling home.

Ten in a Bed

Ten in a bed
And the little one said, "Roll over, roll over."
They all rolled over and one rolled out…
Nine in a bed
And the little one said, "Roll over, roll over."
They all rolled over and one rolled out…
Eight in a bed
And the little one said, "Roll over, roll over."
They all rolled over and one rolled out…
Seven…
Six…
Five…
Four…
Three…
Two...
One in a bed
And the little one said,
"Good night!"

Math at Home

All kinds of play can help your child with math, in the same way as play helps her learn to talk and understand language.

Here are some things your child will do that will show he is learning math:

- puts small things inside big things, and tries to put big things into small things.
- guesses whether something will fit in a space.
- piles things up until the tower falls down.
- asks and understands "when?"

Kids don't need fancy toys to discover math—they need time to play and notice and try things out. You can help by letting them play.

Activity 2 How Much Does It Hold?

When your child can sit up in the bath tub

Put some empty plastic tubs into your child's bathtub. Use many different sizes and shapes—tubs that held chip dip, margarine, ice cream, yoghurt, for example. Watch what happens! Your child will use one tub to fill up another, will try to pour all the water in a big tub into a smaller one, will find out that many dips with a small tub

are needed to fill a big one, and will feel the difference between pouring a small tub over his head and pouring a big one. This is math learning.

When your child can pour without spilling

Get all the mugs and cups out and ask your child to find which one holds the most, so that a special person can have a really big cup of coffee.

Get all the glasses out and ask your child to find which ones hold the most, and the least, so you'll know next time you're having juice or pop.

If you're interested in baking

Get a set of measuring cups and ask some questions, like these:

How many halves in a whole cup? How many quarters? How many thirds? Which is bigger: a quarter or a half?

Later, ask your child to help you double a recipe for a crowd, or cut a recipe in half.

Bath Play is Math Play!

Activity 3 Numbers That Name Things

Sometimes a number is a name. For example, you might know someone who lives in apartment 205. We use the number 205 to name the apartment, but it is not a counting number. Usually there are not 205 apartments in one building. The "2" tells us the apartment is on the second floor, and the "5" tells us which apartment it is. 205 helps us name the apartment so it is different from any other apartment in the building.

Your child can get to know some numbers that name things long before he can count very far.

TV channels

What's the number of his favourite cartoon channel? Let him find the number on the remote and press it. When it's time for him to play quietly so YOU can have some quiet time, let him find the channel for your favourite show. Let him press the button on the remote and get everything fixed up for you.

Bus routes

What's the number of the bus you take home? Show her the number, and show her where to find it on the bus. Then let her watch all the buses come by until she finds the one that will take you home. This is an important job.

Floors of buildings

Are you waiting for an elevator? Watch the numbers above the elevator change as the elevator comes to get you. Count them down, or up. Once you're inside, let him press the button that will send the elevator to where you want to go. Watch the numbers above the door as you ride up or down, so you'll know when to get out.

Phone numbers

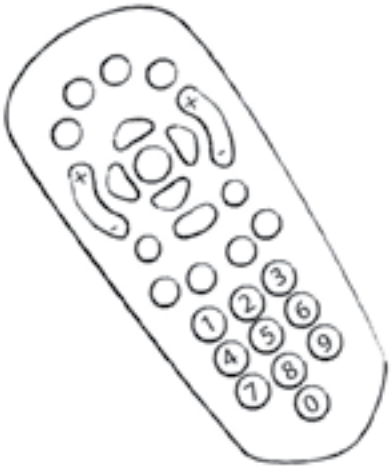
Who do you have on speed dial? Teach your child those numbers, and let her make the call when it's time to call. (Yes, you probably want to keep the phone out of

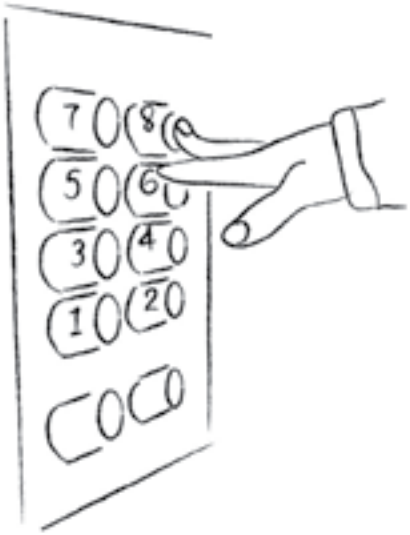
reach most of the time.) Teach her about 9-1-1. Who knows when she'll need it? Teach her to call home. When she's a teenager, you'll be glad she calls.

Addresses

Teach him his own address. If he's lost, or calling 9-1-1, he'll need it.

Sometimes a number is a name!





Activity 4 Learning the Numbers

Count everything

Count out loud as you go through the day with your child. Count the stairs as you climb up or down; count the knives and forks as you get them out or put them away; count the steps as you dance.

Hunt for a special number

Take a day to look for things that come in 1's—1 nose; 1 mouth; 1 kid named "Franny"; 1 clown at the mall; 1 eagle in the sky; and so on. Don't count anything else—just things that you only see 1 of. Another day, look for things that come in 2's—2 eyes; 2 hands; 2 shoes; 2 socks; 2 dogs; 2 cups of tea; 2 wheels on a bicycle. Don't count anything else—just things that you see 2 only of. Another day, look for things that come in 3's—3 wheels on a tricycle; 3 crows; 3 kids; 3 legs on a stool. Don't count anything else—just things that you only see 3 of. Another day, look for things that come in 4's—4 wheels on a car; 4 pieces of apple; 4 flowers on a stem; 4 people waiting for a bus; 4 legs on a table. Another day, look for things that come in 5's—5 fingers on a hand; 5 toes on a foot; 5 pennies; 5 ducks.

Read some of the counting books from the list on page 101.

Activity 5 Make a Counting Book

For some ideas about how to make a book, see Appendix A.

- Collect pictures, either from magazines or photos. If you are using magazines, look for many different pictures of the same thing (for example, dogs or cars or houses or leaves or shoes). You will need pictures of at least 10 different things, with many pictures of each thing.
- On the first page of your book, make a large "1." Let your child pick 1 picture to paste on this page.

- On the next page, make a large "2." Let your child pick 2 pictures of the same thing and paste both pictures on the page (for example, 2 dogs).
- On the next page, paste 3 pictures of the same thing (for example, 3 salmon) and so on up to 10. Use the back of the previous page to give you more room for pictures if you need it.

You can write the name of the things if you like (i.e., 2 dogs) or just the number (2).

You can make the same kind of counting book using photographs. They are more difficult to use, but more meaningful. You will need photos with 1 person in it, with 2, 3, or more. Help your child with picking out the right category for each number. For example, 1 baby, 2 brothers, 3 aunties, 4 cousins, 5 uncles, etc.

An older child learning to read and write numbers could make this book for a younger sibling just learning to count to 10.

Activity 6 Laundry: The Math of Sets

Do the wash

- Little kids can help sort the clothes before the wash.
- Someone can measure the soap and put it in.
- After everything is dry, kids can help sort things into piles—all the socks, all the towels, all the T-shirts.
- Bigger kids can match the socks and put them into pairs and make piles of the clothes after they've been folded, so Peter's T-shirts are all together and separate from Mary's.
- Anyone can help fold. Lots of math there—when you fold a towel, does it matter if you make the first fold crosswise or lengthwise? Can you make a triangle? How many times do you fold a sheet in half to make it fit on the shelf?

Math at the Laundry

Kids can sort, measure, and fold!

- When things are all folded, the sets can be sorted so that the things that are going to the kitchen are together, the things going to the bathroom are somewhere else, and the things going to different bedrooms are sorted to make it easy to put everything away.

The T-shirt that folds itself

Lay the T-shirt flat and face up. Pinch it with your left hand at point A and with your right hand at point B. Holding on to the T-shirt, move your right hand over the left hand to grab the hem of the T-shirt at point C. Keep pinching with your right hand. Lift up the T-shirt, and pull your hand out. (Uncross your hands). Shake it out a little, then lay it face down, still holding it with both hands. Lift both hands and fold it back so the neckline is in the centre. Here are some videos that show you how:

http://www.youtube.com/watch?v=eZ7Lawiw84g&NR=1
(very clear American boy)

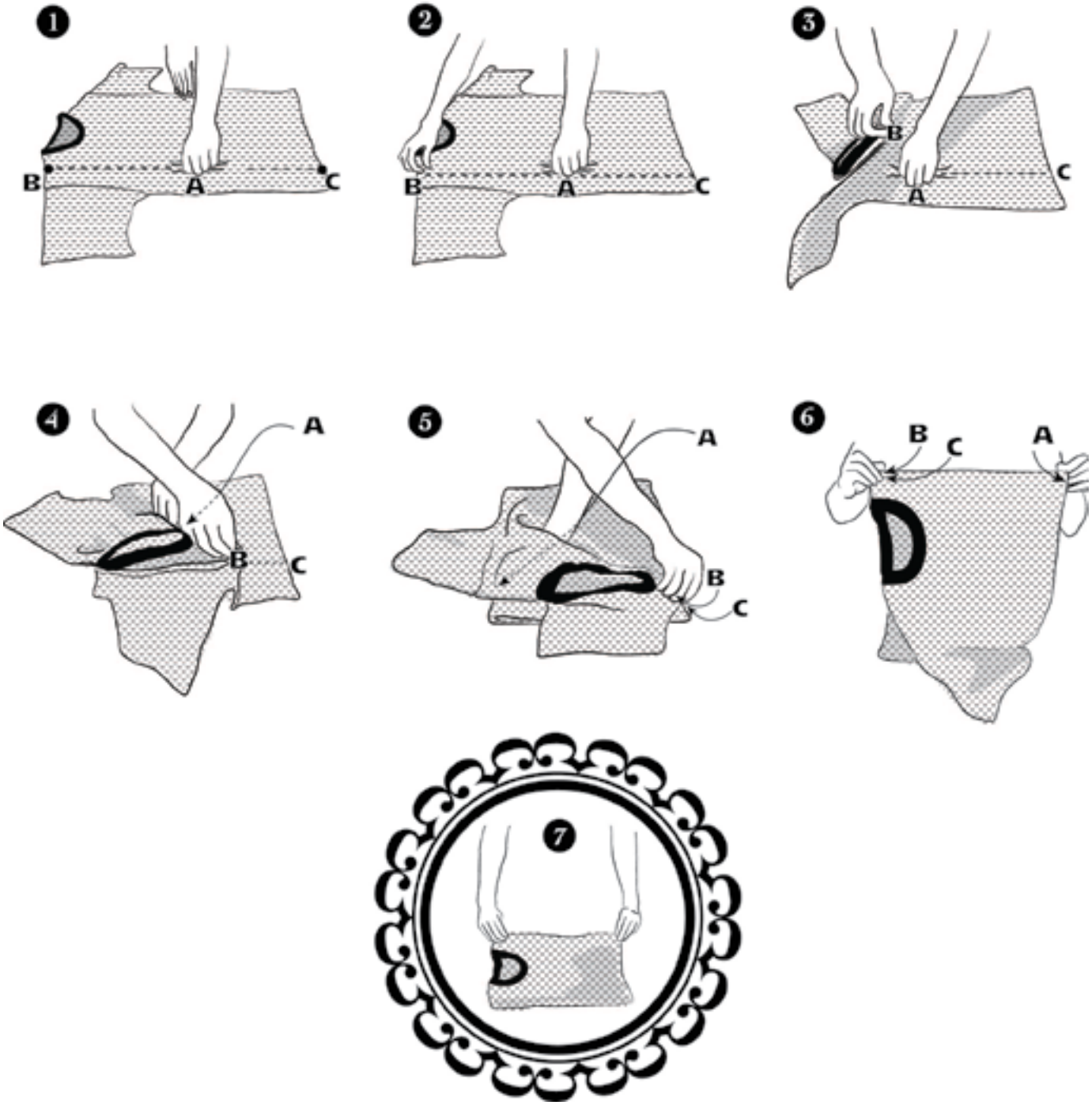
http://www.youtube.com/watch?v=vD6zs9j9QI4&feature=related
(good visuals, no English)

http://www.youtube.com/watch?v=fvNUdcDtTwo&NR=1
(good visuals, no English)

http://www.youtube.com/watch?v=wTPkSJR5i0U&NR=1
(Australian)

http://www.youtube.com/watch?v=kacQlt7zsQY
(good visuals, no English)

The T-shirt that folds itself!



Activity 7 Braiding

Some things to talk about while you are braiding:

- To make a good braid, you have to divide the hair into 3 even parts. Each part is one-third of the hair.
- If the 3 parts are not equal, then you don't have thirds.
- The better you are at dividing the hair into thirds, the more even the braid will be.
- If you are doing French braids, you have to add the same amount of hair to the braid each time. If you don't add equal amounts, the braid will not be even.
- As you move each strand into the middle, the pattern is "from the left, from the right, from the left, from the right," and so on. If you break the pattern, you will get a hole in your braid.

Teach kids to braid a doll's hair, or let them braid your hair.

There are many more complicated braids—ask someone to teach you, or ask for a book at the library.

Ask an elder to talk about traditional uses of braiding.

Braiding is math, too!

Activity 8 Buying Groceries

At the grocery store with little kids:

- Let them count items as you put them in the basket.
- Let them hold the bag open while you put potatoes, or apples, into the bag, and count them as they go in.

Let them get things off the shelf and put them in the basket, at your direction. Ask for the biggest box of cereal, or the smallest. Ask for the coffee in the green can, or the black bag. Ask for the crackers on the bottom shelf, or the middle shelf.

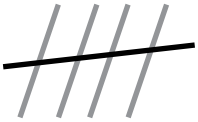
At the grocery store with kids in school:

- When your kid has an idea of how much a dollar is, and what is more than 50¢ and what is less than 50¢, there is a real job he can do at the supermarket—keeping track of how much the bill will be. Ask your kid to help you keep track of the total amount as you put the groceries in the cart.
- If you want to be sure you'll have enough money when you get to the till, round all the numbers up to the next dollar higher. When the first thing goes into the cart, ask how much it is, then ask how much is the next dollar higher. Then help figure out the price to the nearest dollar. For example, if the item is $1.79, ask, "What is the next dollar up?"

Give him a piece of paper and a pencil. Ask him to make a mark for every dollar you put into the cart. If, for example, you put in something that costs $1.79, he will show that as $2.00, and make 2 marks on his page.

Then you put something in the cart that costs $1.19. The next dollar higher is $2.00, so he will make 2 more marks.

Then you buy something that costs 99¢; that is very close to $1.00, so he'll make another mark, but the fifth mark goes sideways. Every $5.00 you put in the cart will result in a mark like this.



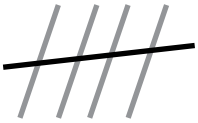
The next dollar you spend starts another set of marks. As you go along, he can count the crossed lines by 5's to give you a running total.

- If you want a closer estimate, you can round up or down to the nearest dollar. The estimate will be closer to the exact total, but it may be a little too low. If you have only $20 in your purse, the estimate might be $20, but the exact amount might be $20.17. Here's how it works:

  If, for example, you put something in the cart that costs $1.79, he will figure out that $1.79 is closer to $2.00 than to $1.00. He will show that as $2.00, and make 2 marks on his page.

  Then you put something in the cart that costs $2.49. That is closer to $2.00 than to $3.00, so he will make 2 more marks.

  Then you buy something that costs 99¢; that is very close to $1.00, so he'll make another mark, but the fifth mark goes sideways. Every $5.00 you put in the cart will result in a mark like this.

  The next dollar you spend starts another set of marks.

  As you go along, he can count the crossed lines by 5's to give you a running total. When you get to the cashier, you both will see how close his estimate was.

- If you have 2 kids, one can use this system and the other can keep a running total on a calculator. It is easy to make a mistake on the calculator, forgetting a decimal point or hitting the wrong key. The kid with the pencil and tally sheet can help keep the calculator honest.

Older kids can pay and check the change.

Math at the Store

Kids can count, keep track, and pay!

Activity 9 Kitchen Chores

Clean it up, then mess it up, then clean it up again. Get it out, then put it away, then get it out again. That's life in the kitchen, and there is a richness for math learning in that pattern.

Setting the dishes out

Maybe you're handling the plates, and a little one can help with the forks and knives and spoons.

Very little ones won't count at all. You might ask, how many plates do we need? One for grandma, 1 for grandpa, 1 for brother, 1 for sister, and so on, pulling out a plate as you say each name. Then, how many forks? Let the little one get out a fork for each person as you name them again. Then, how many knives? The little one can pick out a knife for each name, again.

As they begin to count things, you could first count: How many people for supper? Name and count each one. Let's say 7, for example. You count out 7 plates. Then ask, how many forks? You may have to count the people again, or maybe count the plates, or maybe the kid will remember. Let the kid count out the forks. Again, how many knives? Let the kid count out the knives.

In any case, while everybody is eating, you'll get a chance to check that everybody has a fork and knife and plate, and congratulate yourselves on the counting.

Putting the dishes away

Time for sorting. Give a kid all the forks and knives and spoons and ask him to sort them and put the forks where they belong, the knives and the spoons in their places. Big spoons and little spoons. Maybe big forks and little forks each have their own place.

An older child can put away mugs and cups. What to do with the handles is an interesting problem, especially if there are lots of mugs and not very much space to put them in. How much space do things take up? How can I fit things into a tight space? Both these are problems that a kid can work on without even knowing that she is doing math.

Math in the Kitchen

Activity 10 Making Cookies

Find a couple of recipes for cookies, and try some of these ideas:

- Make the first recipe, and another day try the other recipe.
- Divide into teams. Each team uses a different recipe, and gives half its cookies to the other team.
- Try making the recipes slightly differently (add chocolate chips, different nuts, sugar substitute).
- Make a batch of cookies and divide it in half; keep half the cookies for the family and give the other half to someone special, with a card.
- Double the recipe.
- Make both kinds of cookies, and do a survey asking which kind people like better. Keep track of what people say, and graph your results.

Activity 11 Telling Time

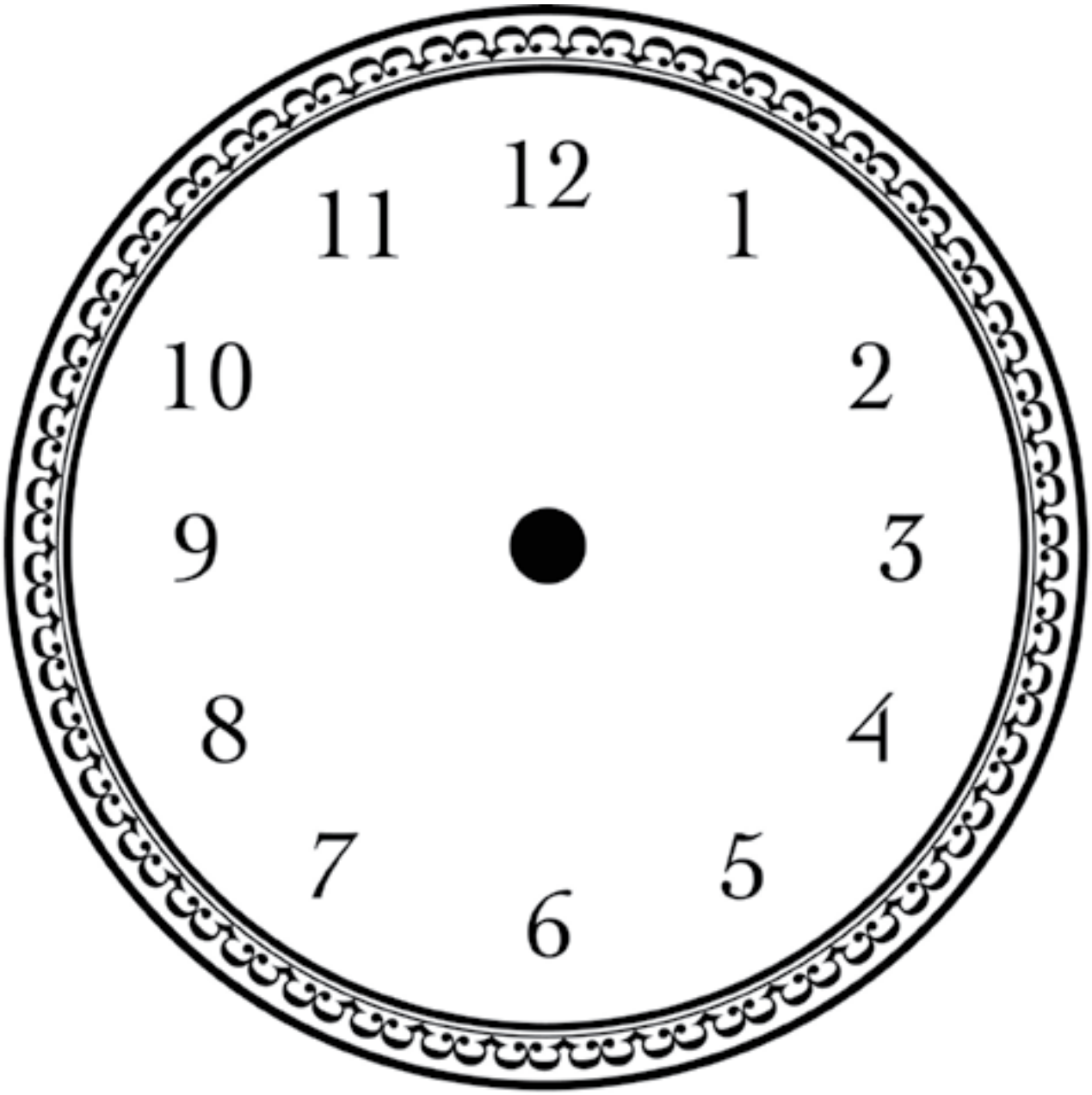
When can we go? When will Grandma get here? When does my show come on? Is it my birthday yet?

This kind of question tells you your child is ready to learn how to keep track of time, and ready to start using a clock and a calendar.

- Make the play clock on the next page. There are lots of things you can do with it.
- Set the play clock to show the time you will leave the house to go somewhere fun. Let your child keep track of the real clock until it looks the same as the play clock. Then it's time to go! You can set the play clock to show whatever your child is waiting for—a special TV show, or the time the older kids come home, or bedtime. Whenever he says, "When will...?" you can show him on the play clock, and wait for the real clock to match it.
- When your child is good at telling time with a face clock, start to use a digital clock or watch. Look at the digital time, then use the play clock to show the same time as

the digital. Help your child to see that the digital clock shows the hour first, then the minutes, but usually with the face clock we talk about minutes first, then the hour.

Make a map of some special day, showing all the things your child does in the day, from morning to night. Draw some clocks to show the times. You could do this at the end of the day, to tell the story of what happened, or you could do it the night before, to get ready for the special day.



Cut along the dotted line. Glue the clock face to a piece of cardboard. Glue the hands to a piece of cardboard, then cut them out. Use a brad to pin the hands in the centre of the clock.

Activity 12 Calendars

Start with a calendar that shows a week. Later you can go on to use a calendar that shows a month, and then a whole year.

A week at a time

Make the weekly chart shown on the next page.

Before the week starts, sit with your child and talk about the week that is coming up. Talk about all the things that are planned for that week, and write, draw, or use a sticker to show what is happening on each day. Put the chart on the fridge or somewhere it is easy to see.

Then when your child asks, "How long until…?" you can use the chart to count the sleeps, or count the days, or name the days until the special day comes.

A month at a time

Use a page from a commercial calendar, or fill in the name and the numbers on the chart that follows. If you use the chart, your child will see that the month does not always start on the same day of the week.

Again, use stickers or drawings or writing to show the events of the month to come. Your child will begin to see the patterns—soccer game every Saturday, parents' group every Tuesday, and so on.

A whole year

In December or early in January, get a calendar for the new year, and mark it with writing and stickers or drawings to show all the special dates that come every year. Start with the child's birthday. Help your child find the month and the day, and put a sticker in the square and write the child's name. Then do the same for each family member in turn, and go on to friends. Then think of other special days, such as holidays or anniversaries. Mark each of them in turn. Then hang the calendar where you can use it all year to keep track of special days.

Calendars marked in this way make lovely gifts for grandparents and aunts and uncles.

Sunday	Monday	Tuesday	Wednesday

Glue here and put this strip under Wednesday	Thursday	Friday	Saturday

Month _____

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

Activity 13 Money

- You can use money to practice counting by 1's, 5's, 10's, and 25's.
- Let your kid pay for his own treats and get the change.

- ***Double your money!***

  When you want to give a gift of money, here's an offer a kid can't refuse:

  "I'll put a penny in a jar. The next day, I'll double it and put 2 pennies into the jar. The next day, I'll double that and put in 4 pennies, and so on, every day for a week. At the end of the week, you can have all the money in the jar, or I'll give you a dollar. Your choice."

  You can do this for any amount of time, but be careful or you will end up paying much more than you expected. You will start on day 1 and put 1 penny in a jar. The next day, you will put in double that much—2 pennies. The next day you will put in double again, 4 pennies, and the next day you will double the amount to 8 pennies, and so on, doubling every day. Say how many days you will double the money for, and say that at the end, the child can keep all the money in the jar, or you will trade the money in the jar for a certain amount. The child can choose.

  How long you go depends on how much you want to give. If you want to give about $10.00, offer to double for 10 days, and say you will buy the jar back for $8.00.

  If you want to give about $40, offer to double for 12 days, and say you will buy the jar back for $30.00.

  If you want to give about $80, offer to double for 13 days, and say you will buy the jar back for $75.00.

  If you want to give about $160, offer to double for 14 days, and say you will buy the jar back for $150.00.

Day	Amount to put in	Total to date
Day 1	1 cent	$.01
Day 2	2 cents	$.03
Day 3	4 cents	$.07
Day 4	8 cents	$.15
Day 5	16 cents	$.31
Day 6	32 cents	$.63
Day 7	64 cents	$1.27
Day 8	$1.28	$2.55
Day 9	$2.56	$5.11
Day 10	$5.12	$10.23
Day 11	$10.24	$20.47
Day 12	$20.48	$40.95
Day 13	$40.96	$81.91
Day 14	$81.92	$163.83

You have given the child an interesting problem, and have given many days for the child to think and talk about what is going on.

At school: If someone is going to donate some money to the school, ask the donor to help set up a similar problem, and come in every day to double the money. For example: Someone who wants to donate about $300 to the library, or the gym, or the band could come in every day to give double the amount of the day before. On day 15, she would have given a total of $327.65; she could offer the children the choice of keeping the money in the jar, or getting $300. If this seems like too many days to come in, she could start on the first day with $1.00 and by day 9 would have put about $250 in the jar.

Activity 14 Measuring

Before your child knows numbers...

Make a long strip of paper by pasting shorter pieces together. You can add more pieces if you need them later. Let your child measure whatever he wants (for example, the height of a teddy bear or doll). Your child can lay the paper strip along the toy, mark on the paper the height of the toy, and draw a picture of the toy beside the mark. Then he can use the same paper to measure another toy, or himself, or a table, or whatever. Don't worry about getting it right. Sometimes the paper strip will show the teddy is taller than the child. If your child notices, let him figure out what went wrong. If he doesn't notice, don't say anything. The lesson he is learning here is that you have to start each measurement from the same place on the tape if you want to compare the measurements. Give him lots of time and many tries to figure out that important lesson for himself.

It is fun to measure around things, too: around the teddy's waist; around a footstool; around a chair; around his own wrist or waist; around a coffee mug.

Start a height chart for him. Measure him against the door frame, so he can see how he is growing over the months and years. If you want a record you can take with you when you move, mark the measurements on a long strip of paper taped to the wall, or on a tall flat stick.

When your child is learning to read numbers...

Use the same kind of paper strip to measure some things, then use a tape measure on the strip to measure the thing in centimetres or inches; write down the number. Don't worry about fractions at first. The strip will keep a record of all the things measured, and it will be easy to see which is longest or biggest around.

Give your child a tape measure and let her measure whatever she wants. If she wants to remember the measurements, help her write them down. Talk about what surprises her as she is measuring, and about any patterns she sees.

A little more advanced...

Make some graphs to record the measurements that interest your child. Graph paper and felt pens are great. Kids can also make graphs online at

http://nces.ed.gov/nceskids/createagraph/

- Heights of family members and friends—whoever will stand up and be measured. Use 1 square on the graph paper for every 20 cm in height, or 1 square for every 10 cm in height.
- Show the height compared with the "wingspan" of a few people. Again, 1 square on the graph paper for every 10 or 20 cm.
- Show the length of the foot compared with the distance from the wrist to the inside of the elbow of a few people. Use 1 square for 1 cm.

Math and Measuring

- how big around?
- how much does it hold?
- how tall?

Math in Nature

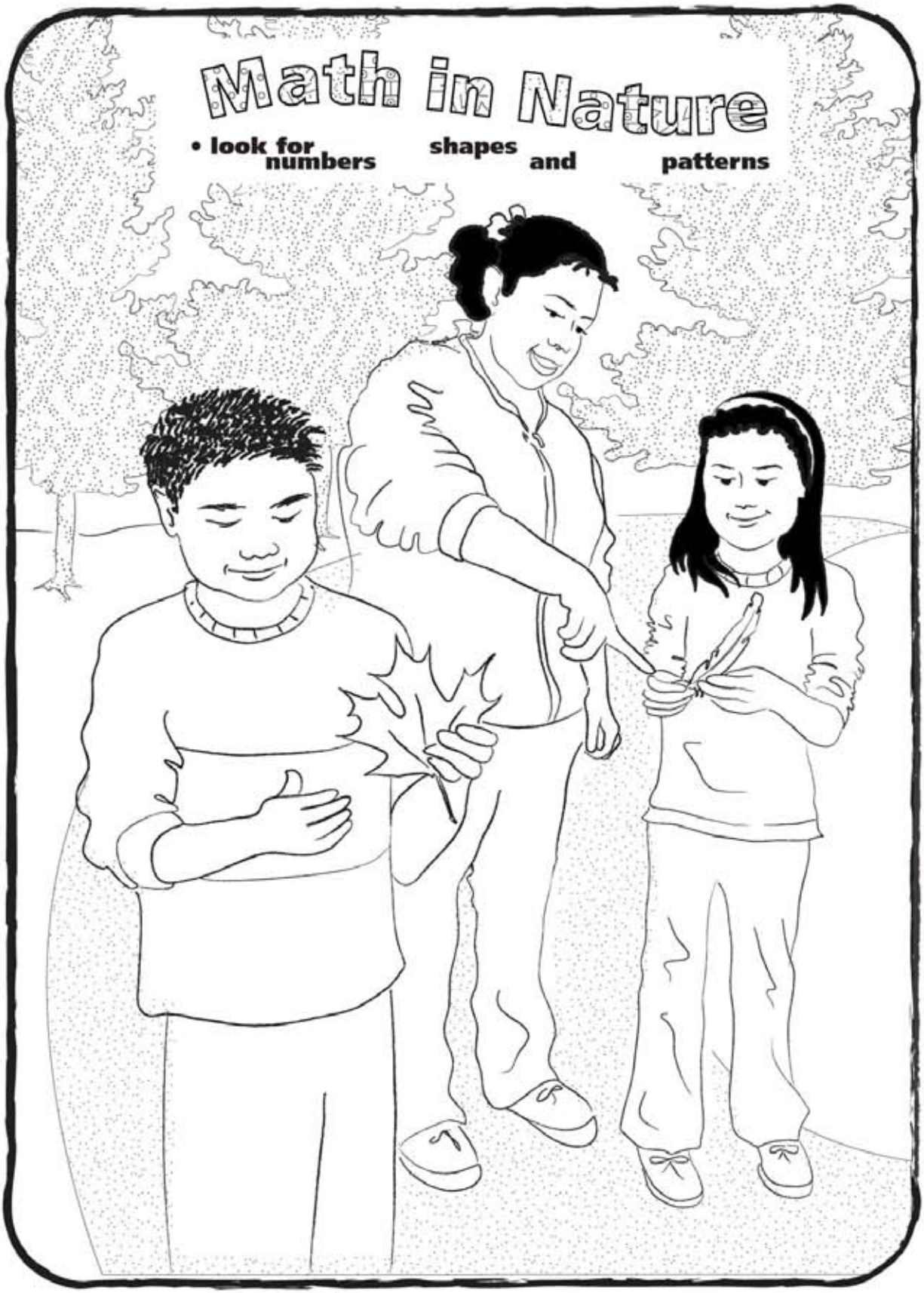
Activity 15 Take a Nature Walk

You might not think going for a walk in nature could lead to math, but it's true. Math and Nature are very close friends. If you know nature well, patterns, shapes, and numbers can help you pass on what you know about the world around us.

- Go for a walk in the forest or by the water, or in a park or your backyard. Even as you walk your kids to school you will see patterns in nature. Help your child notice numbers, shapes, and sizes.
- As your kids get older, longer walks are possible. Go for a walk with someone who knows nature—an elder, a fisherman, a hunter, or a park naturalist.
- Some leaves have 3 parts, some only 1, some have many. They all seem to be odd numbers. I wonder why? Make a collection of leaves of different shapes. When you get home, sort the leaves in many ways—by shape, by size, by colour, or in any way you see.
- Look at the tracks animals leave. How can counting help you figure out what animal left each track? What shapes do you see in the tracks? Draw the tracks.
- Listen to the sounds that birds make. What patterns do you hear? How can the patterns help you figure out what bird is calling, even if you can't see it?
- Count the legs as you see the creatures: 0 legs, 2 legs, 4 legs, 6 legs, 8 legs, 100 legs, 1,000 legs. They all seem to be even numbers! I wonder why?
- If you live by the ocean, keep track of the tides

Math in Nature

- look for numbers shapes and patterns



Activity 16 How Long Is a Day?

Keep track of the time the sun rises and sets every day for a year. Pick 1 day a week, and use the chart on the next page to mark the time of sunrise and sunset on that day. Your chart will show the pattern as the days get longer in the summer and shorter in the winter. You will see a big jump when the time changes because of daylight savings time. (Spring forward, fall back.)

You can find the time of the sunrise and sunset on the TV weather channel, or in the newspaper.

You can also look it up online (for example at http://www.earthtools.org/). When you are online, check to see if the time they give is standard time or daylight savings time, and adjust accordingly.

Hours of Daylight

sunset (p.m.)

11:00
10:00
9:00
8:00
7:00
6:00
5:00
4:00
3:00

5 Hours

sunrise (a.m.)

10:00
9:00
8:00
7:00
6:00
5:00
4:00
3:00

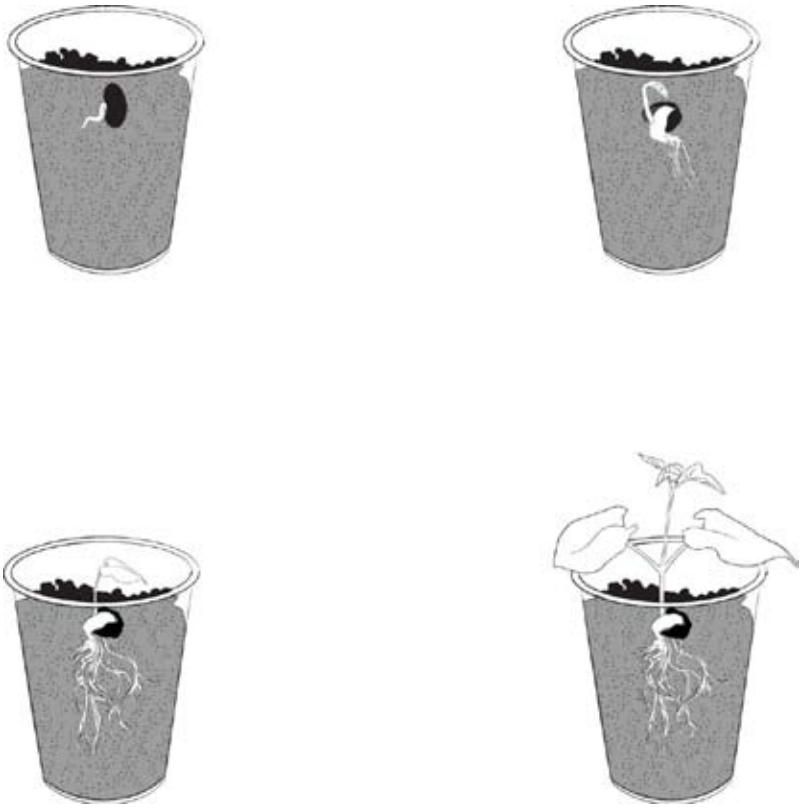
Month:

Month:

Activity 17 Plant a Seed

Plant some bean seeds in a small pot. Your child can plant, water, and measure the bean as it grows. Beans are ideal because they grow very quickly.

Plant some seeds around the outside of a clear plastic or glass pot, so you can watch them sprout. First line the pot with a piece of paper towel, then put the soil into the pot. Slip the bean seeds between the paper towel and the side of the pot and they will be easy to see. Put the seeds in various positions (i.e., on end, rounded side up, rounded side down). Water and watch as the roots all go down and the stem goes up, no matter how the seeds are placed.



Activity 18 How Does the Moon Change Shape?

In the fall, winter, and spring, we can see the moon earlier in the evening, because the days are shorter. This means that your kids are likely to be up late enough to see the moon and make the drawings.

Start sometime when the moon is full, and look at the moon together. Talk about the shape, and draw it and write the date on the drawing. About a week later, make another drawing, and so on every week for 6 to 8 weeks. If you like, you can use the chart on the next page to keep track of your drawing.

Moon Math

This is what the moon looked like on these dates:

date:_____	date:_____	date:_____
date:_____	date:_____	date:_____
date:_____	date:_____	date:_____
date:_____	date:_____	date:_____

Draw the moon on the same day every week for a few weeks.
What patterns do you see?

Playing with Shapes

Activity 19 Hunt for Shapes

- Pick a shape to look for wherever you and your child go for the whole day. Find that shape, wherever it is. For example, if you are looking for circles, notice clock faces, wheels, headlights; another day, if you are looking for rectangles, notice windows and doors, signs, and so on.
- Some days, look for a flat shape, such as triangles, rectangles, squares, circles; other days look for a shape that is not flat, such as cylinders (tin cans) and spheres (oranges) and pyramids.
- Read a book about shapes, from the list in Appendix B.

Activity 20 Make a Picture

Copy the pages of shapes on the following pages on coloured paper and cut them out.

- Use the shapes to make a picture by gluing them onto a sheet of paper. Make a picture of an animal, or a person, or your home, outside or inside, or your street or the forest, or anything you want.
- When it's time to put the shapes away, sort them and put them in different envelopes.

Make it harder

- Make a picture using only 1 shape in many colours and sizes.

Activity 21 Make a Memory Game

Make your own game.

- Copy the following pages of shapes on coloured paper and cut them out.
- Pick 8 of the shapes you cut out. They may be different shapes, or the same shapes in different colours or sizes. Then pick another 8 exactly the same as the first. For example, you might have 2 red squares, 2 yellow circles, 2 green circles, 2 large green triangles, 2 small green triangles, and so on.
- Get 16 index cards, or cut 16 cards out of heavy paper.
- Glue each shape to the front of one of the cards.
- Sort the leftover shapes and put them in different envelopes.

How to play

- Mix up the cards and put them face down.
- The first player turns over 1 card, then turns over another card, trying to find a match.
- If the 2 cards are the same, she takes the 2 cards and puts them beside her. It is still her turn, so she turns over another card, then turns over another to see if it matches.
- If the 2 cards are not the same, she turns them back over in the same place, and her turn ends. The other player takes a turn.
- The winner is the player with the most pairs. Some kids like to know who is the winner, and other kids don't care.

Make it easier

Use only 6 or 8 cards.

Activity 22 Pull a Pair

Make the game

- Copy the pages of shapes that follow on heavy coloured paper and cut them out.
- Pick 8 of the pieces you cut out, all different. They may be different shapes, or the same shapes in different colours or sizes. Then pick another 8 exactly the same as the first. For example, you might then have 2 red squares, 2 yellow circles, 2 green circles, 2 large green triangles, 2 small green triangles, and so on.
- Put all of the shapes into a paper bag or a big envelope.

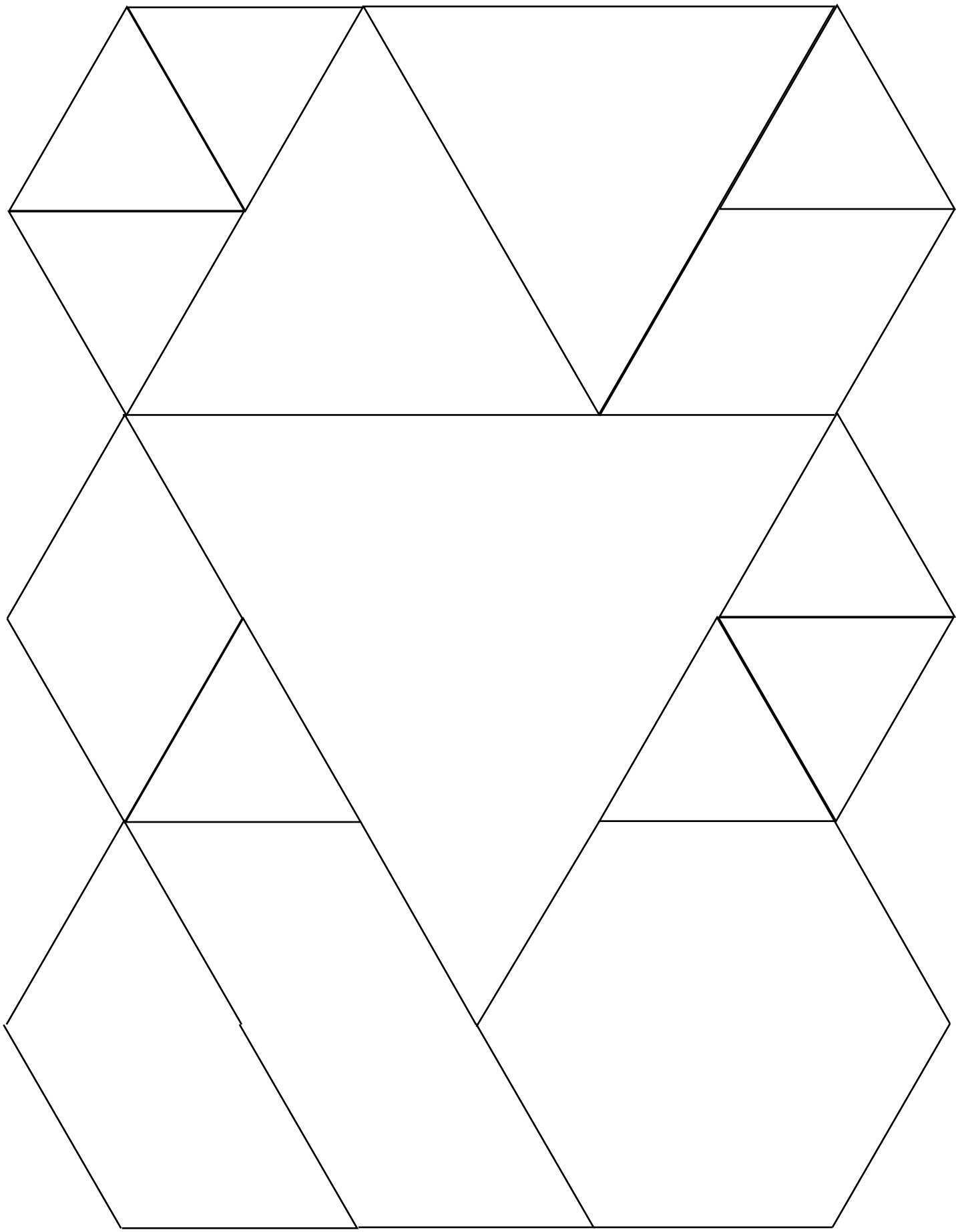
Play the game

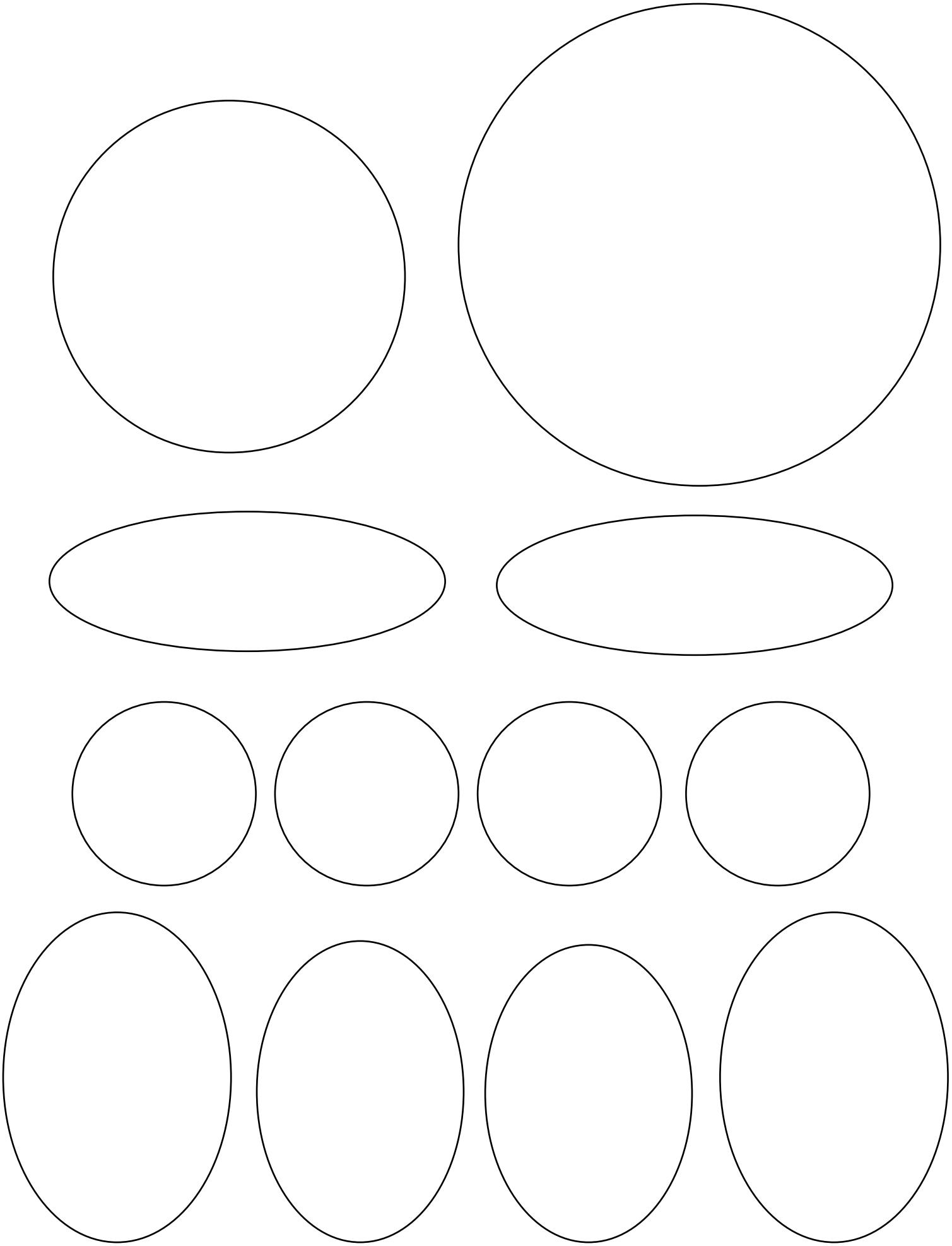
- The first player reaches into the bag or envelope and pulls out a shape and puts it on the table. Then she reaches in and pulls out another shape. If it is exactly the same as the first shape, the player wins the pair. If it does not match, the player puts the second shape beside the first.
- The second player takes a turn, picking 1 shape out of the bag and trying to match it with the shapes already on the table. Then she pulls another shape out of the bag and tries to match that one.
- Every turn, the player gets to pull 2 shapes out of the bag and tries to match a shape already on the table. When she finds a match, she wins the pair.
- Keep taking turns until all the shapes are out of the bag.

Make it harder

Put more pairs into the bag to start.

Change the rules about matching. Put shapes of 2 different sizes and 2 or 3 colours in the bag. A big square could match with a big triangle (both big), or a red circle could match with a red square (both red), or a big square could match with a small square (both square).





Things to Make

Activity 23 Make a Collection

Make a collection of leaves or pictures or coins or rocks or whatever your child is interested in.

- Help your child figure out a way to organize the collection. For flat things, a scrapbook might be good, or see Appendix A for suggestions about how to make a book. For bulky things, a binder with pockets might work, or a box with dividers.
- Help your child figure out a way to display the collection so others can see it. A special shelf or a section of the fridge door might work.
- Give your child lots of time to talk about his collection. Listen.

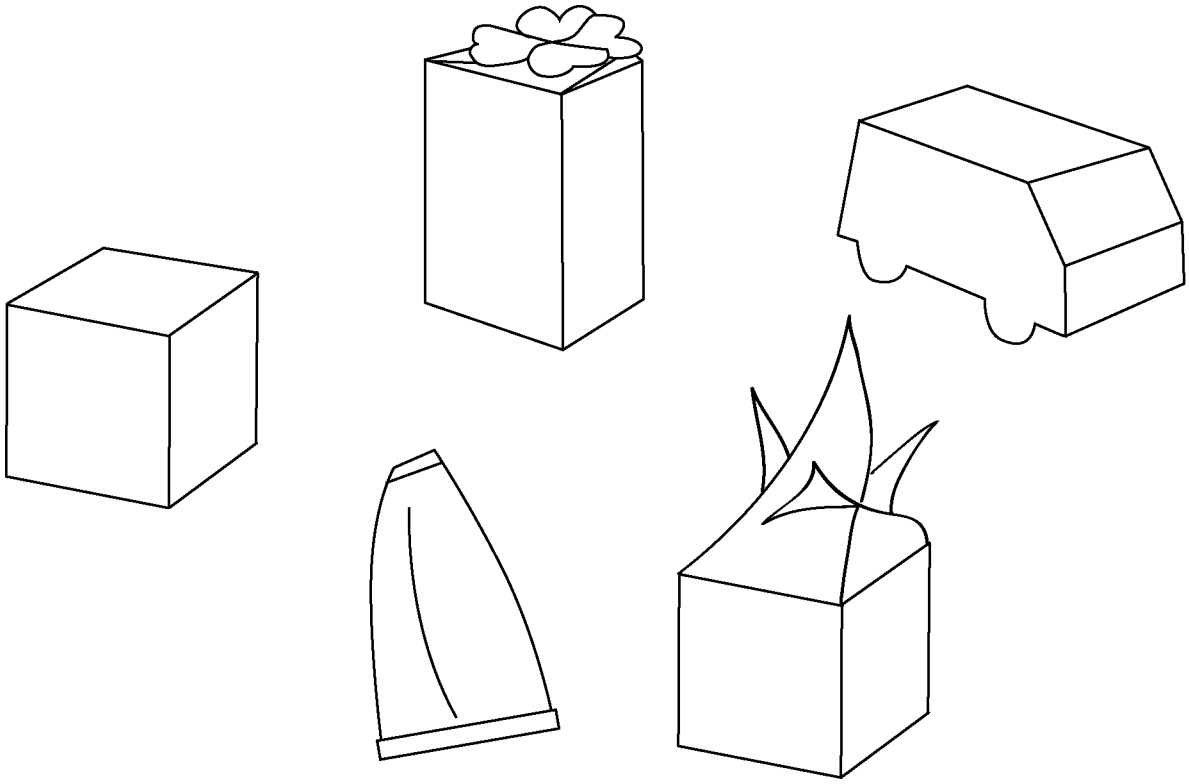
Activity 24 Making Boxes

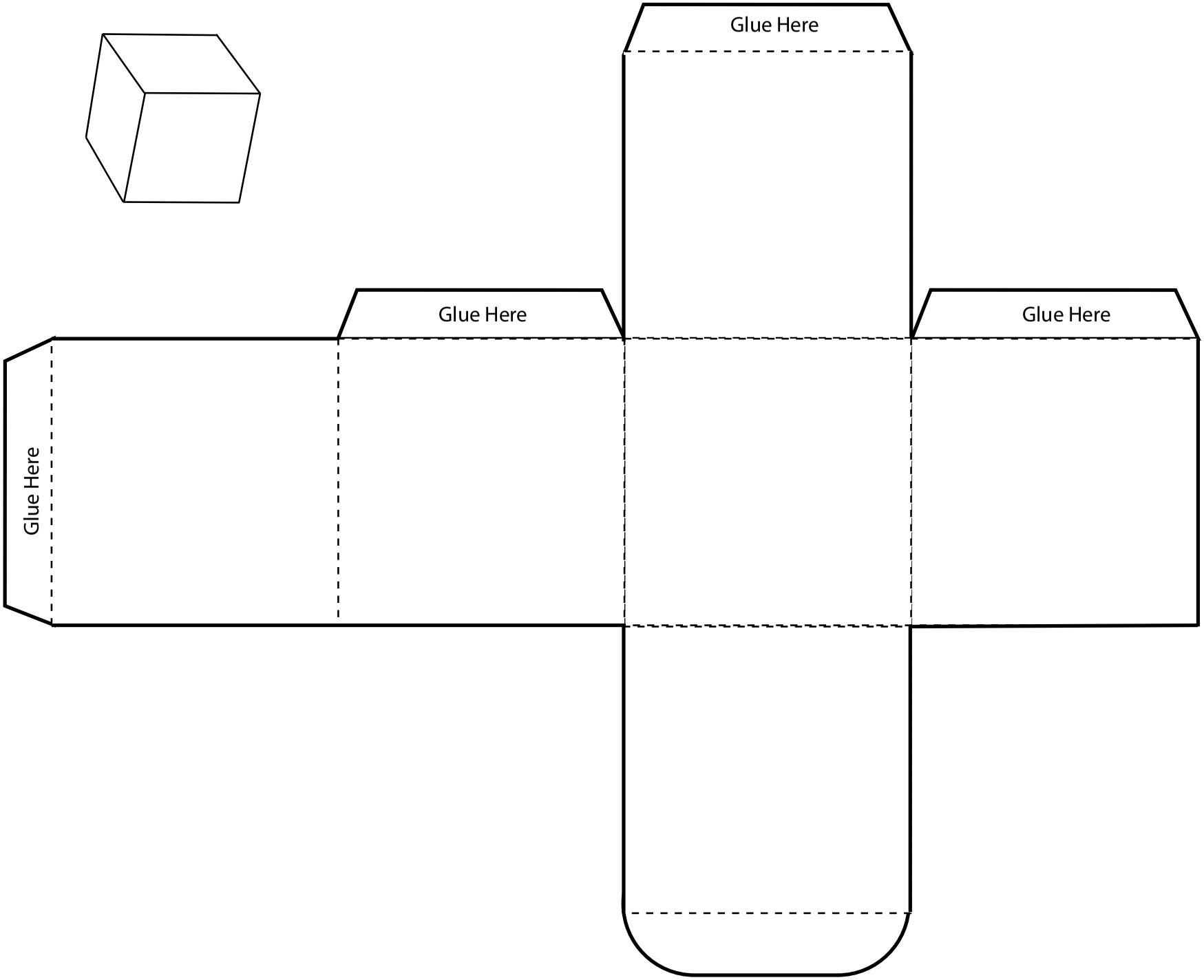
Make and decorate boxes to hold a present or to store treasures, using one of the patterns that follow.

- Cut on the solid lines, score and fold on the dotted lines, and figure out how they will look when they are glued together.
- Flatten them again, and decorate them while they are flat.
- Fold them and glue them according to the directions.

All the patterns here can be enlarged on a photocopier to make larger containers.

When kids have used the patterns here, they can figure out how to make their own patterns to make a container just the right size and shape for something special.

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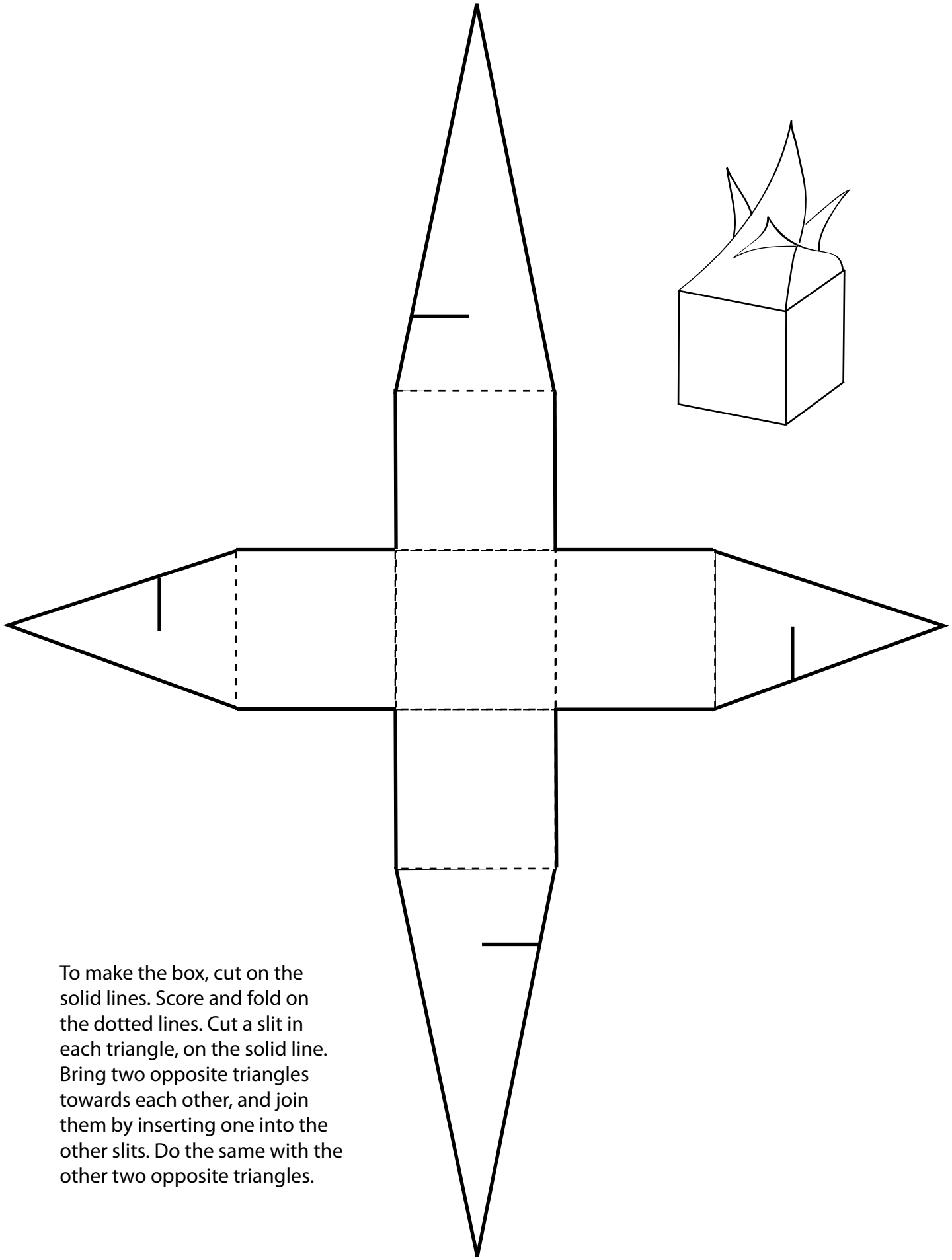
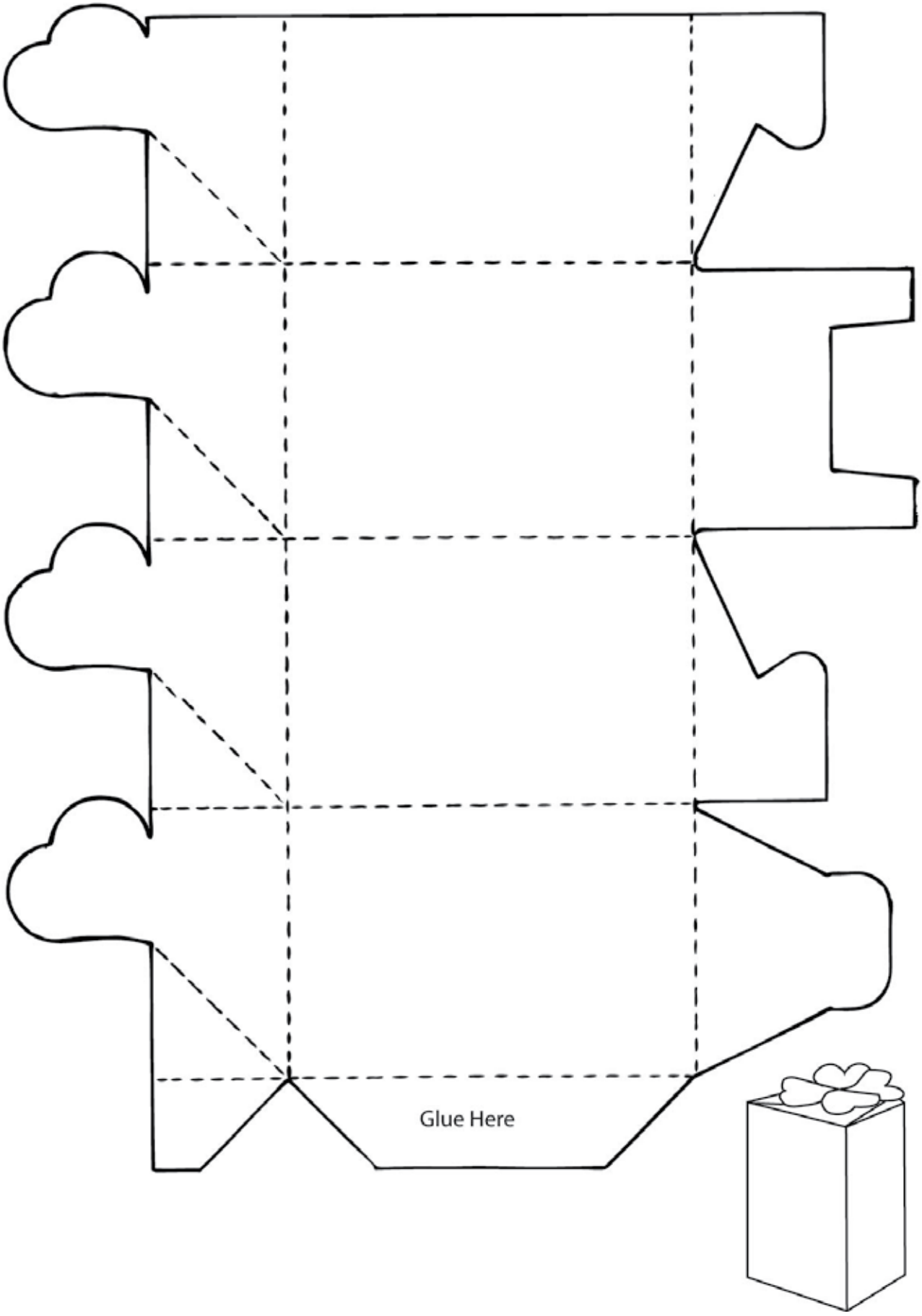


To make the box, cut on the solid lines. Score and fold on the dotted lines. Cut a slit in each triangle, on the solid line. Bring two opposite triangles towards each other, and join them by inserting one into the other slits. Do the same with the other two opposite triangles.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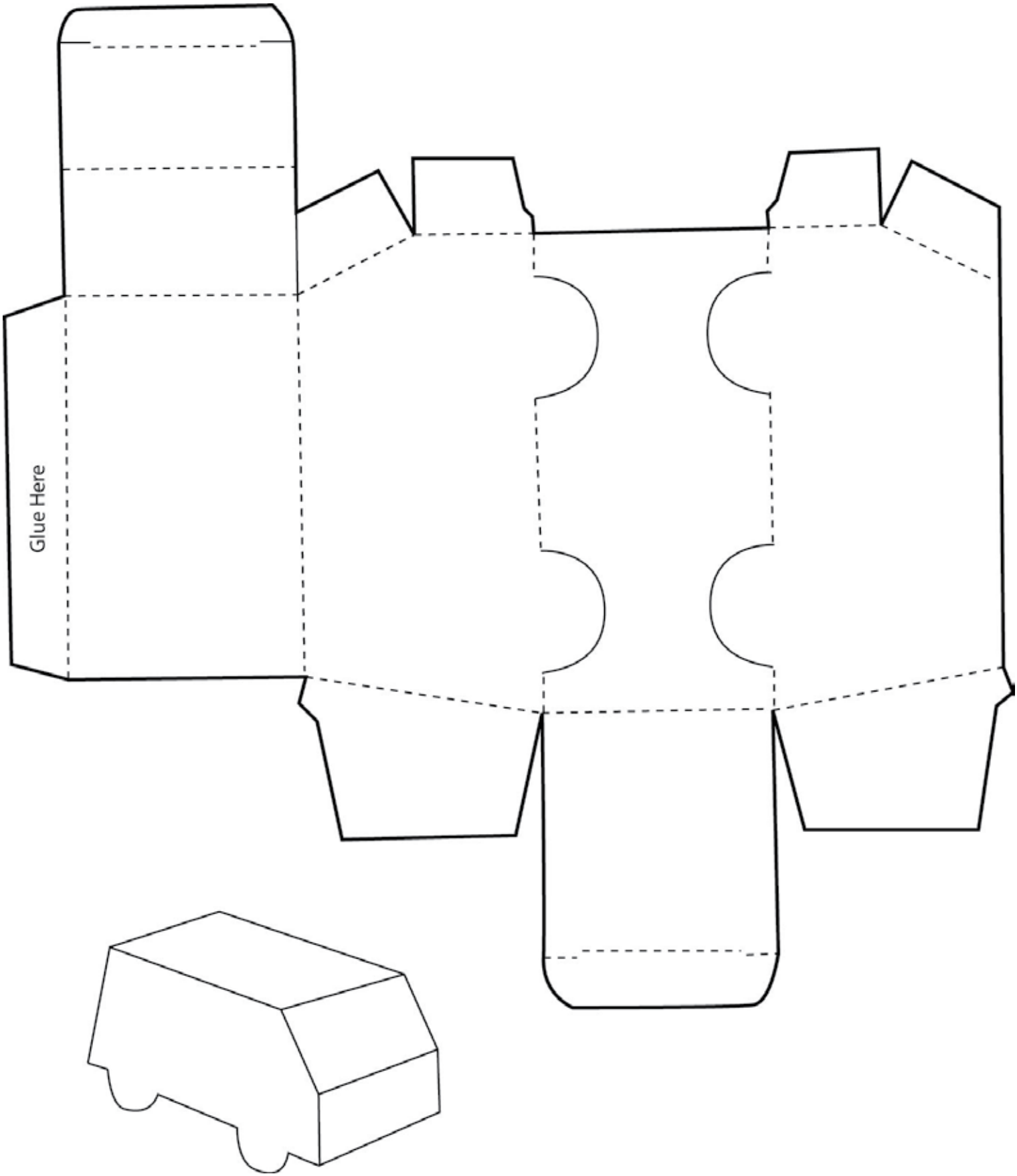
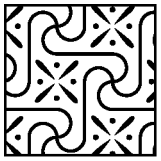

Glue Here

Take a square of paper of any size, and decorate it as you like.

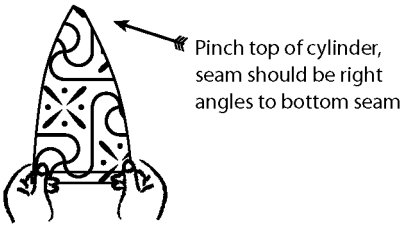


Roll it to make a cylinder, and glue the edges together to make a seam from the top to the bottom.

Pinch the bottom of the cylinder into a flat seam, and glue it together. (The first seam should be in the centre of the new seam, on one side.)

Put some things that will rattle into the piece.

Hold the box by the bottom seam. Give it a half turn, and pinch the top of the cylinder into the flat seam. This seam should be at right angle s to the bottom seam.



If you make many of these boxes, they will stack together very well.

What could you put in this box?

- Any gift that has many small pieces, such as a bunch of candies, or marbles, or hair clips.
- Any small gift that won't be hurt if it is shaken around, such as a necklace or chain.
- A few stones or beans to make a rattle that you don't open.
- Five things you are grateful for. (Write them on strips of paper and crumple up the strips before you put them in the box.)

Activity 25 Sidewalk Chalk

Use the recipe that follows. If the children are young, parents should measure the dry ingredients into baggies before the children arrive. Measure and add the water when you are ready to make the chalk. Children can mix the mixture in the baggie while parents cover 1 end of each tube with the duct tape. Then snip a hole in 1 corner of the baggie and pour the mixture into each tube.

Older children can cover the ends of their tubes first, then measure and mix ingredients.

Sidewalk Chalk

Don't pour plaster down the sink or toilet! It will plug the pipes!

To make about 4 pieces of chalk, you'll need:

2 cups water

2 cups plaster of Paris

2 tablespoons tempera paint (wet or dry)

paper tubes for wrapping coins (widest available)

duct tape

Mix the plaster, water, and paint in a paper cup or plastic bag. Let it sit for 2 or 3 minutes.

Cover 1 end of each coin tube with duct tape.

Pour the plaster mix into the tubes. If you've mixed it in a plastic bag, cut off one corner of the bag and pour from the corner. Let the chalk stand until hard. Peel off the wrappers and let the chalk dry for a few hours.

Throw out dried plaster, stir sticks, cups, etc.

Working with plaster of Paris: Use a new cup or bag and stir stick every time. If you get bits of hard plaster into a new batch, it will harden very quickly and you will not be able to pour the chalk. NEVER POUR PLASTER INTO SINKS OR TOILETS. It will harden and block the pipes.

Activity 26 Play Dough

There are 2 recipes for play dough here, and lots of things to do with them.

- Make 1 kind of play dough, and another day try the other recipe.
- Divide into teams. Each team makes 1 kind of play dough and then gives half their dough to the other team. Decide which recipe makes the best play dough.
- Make a batch of play dough to give to someone special, with a card.
- Double the recipe.
- Make both kinds, and then survey people to ask them which kind they like better. Keep track of what they say, and graph the results.

Play Dough 1

1. Mix these ingredients:

- 1 cup flour
- ½ cup salt
- 1 teaspoon cream of tartar

2. Add:

- 1 cup water
- 1 tablespoon oil
- food colouring

Cook over medium heat, until it forms a ball. Remove from heat and cool. Then knead until smooth. Store in plastic bags or tubs.

Play Dough 2

1. Mix these ingredients:

- 2 cups flour
- ½ cup salt
- 2 tablespoons cream of tartar

2. Add:

- 2 cups water
- 8 drops food colour
- 2 tablespoons oil

3. Cook until it forms a ball in pan.

4. Cool completely.

5. Store in a plastic bag or tub.

Card Games

Card Games for Smart Kids and *Deal Me In! The Use of Playing Cards in Learning and Teaching*, both by Margie Golick, include many card games that children love to play.

Activity 27 Memory Game

This is a game that most kids are better at than most adults, so it is a good game for parents to play with their kids.

Play with cards

Deck

Use the whole deck. If you like, you can use 2 jokers. Lay the cards out in a pattern (6 rows of 9 if you are using the jokers; 4 rows of 13 if you are not using the jokers.) For younger children, don't use the face cards or the jokers. Just use the ace to 10 in all suits.

Play

The youngest player starts. She picks a card and turns it face up. Then she picks another card and turns it face up. If the cards match, she picks them both up and keeps them beside her. Then she takes another turn. She keeps on as long as she finds a match each time she turns up 2 cards. When she does not pick a matching card, she turns them both face down again, in the same place. The other player takes a turn.

Continue to play until all the pairs have been found. The player with the most pairs wins the game. Some kids don't care about winning, and other kids care.

Make your own memory game

- Use photos of the family. If you have double prints, use the same pictures. If you don't have double prints, use pairs that show the same person or people, For example, 2 pictures of sister, or 2 pictures of grandpa and grandma.
- Use cards with different shapes on them—circles, squares, rectangles, triangles, etc. An older child could make a set for a younger child. (See Activity 21.)
- Use cards with 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500.

Activity 28 Learning the Deck

This is a treasure hunt through the deck. Fun to do, and lets you find out who knows the deck and who needs help.

Again, this will be a situation where the parent knows more than the child—the object is not to get the answers filled in, but to let the child explore the nature of the deck. Some number facts here—13 + 13 + 13 + 13 = 52; 4 × 13 = 52.

A Deck of Cards

How many cards in the deck?	How many face cards?
How many black cards?	How many red cards?
How many diamonds?	How many hearts?
How many spades?	How many clubs?
How many red face cards?	How many black face cards?
How many face cards are female?	How many face cards are male?
How many jokers?	How many 1's?
How many 2's?	How many 3's?
How many 4's?	How many 5's?
How many 6's?	How many 7's?
How many 8's?	How many 9's?
How many 10's?	How many kings?
How many queens?	How many jacks?
Which king is facing left?	Which kings have swords?
Which kings have moustaches?	Which queens are holding flowers?
Which jack is looking right?	Which jack is looking left?
Which jacks have moustaches?	What number is shown on the ace?

Activity 29 No Way!

This game helps kids count and learn to read numbers, and to bluff and notice when someone else is bluffing. It is lots of fun. It has many other names—"I doubt it!" "Cheat," "Bull****."

Deck

Use 1 deck of cards. Take the jokers out. With very young kids, take the face cards out of the deck, and just use the ace to 10 cards. If you have more than 5 players, use 2 decks of cards.

Goal

The winner is the first person who gets rid of all his cards.

Play

Shuffle the cards and deal them all out. It doesn't matter if some players have 1 more card than others.

The first player takes some cards from his hand and puts them in the middle of the table, face down, and calls aces. If he puts down 1 card, he says, "One ace." If he puts down 2 cards, he says, "Two aces." If he puts down 3 cards, he says, "Three aces" or, if he puts down 4 cards, he says, "Four aces." He can play whatever cards he likes, but he has to say they are aces.

The next player takes some cards from his hand and puts them on the table, face down and calls 2's. If he puts down 1 card, he says "One 2." If he puts down 2 cards, he says, "Two 2's." If he puts down 3 cards, he says, "Three 2's" or, if he puts down 4 cards, he says, "Four 2's." He can play whatever cards he likes, but he has to say they are 2's.

The next player takes some cards from his hand and puts them on the table, face down. If he puts down 1 card, he says "One 3." If he puts down 2 cards, he says, "Two 3's." If he puts down 3 cards, he says, "Three 3's," or, if he puts down 4 cards, he says, "Four 3's." He can play whatever cards he likes, but he has to say they are 3's.

The next player does the same thing, saying "5's." The next player says "6's" and so on. When you get to kings, the next player starts again with aces.

You don't have to play the cards you say you are playing. You can try to bluff whenever you want to, and sometimes you have to bluff. You have to put down at least 1 card, and you can put down any number of cards. You are trying to be the first to get rid of all your cards. It may be your turn to say "7's," but you might put down two 5's and a king, and say "three 7's."

"No Way!"

If you think another player is bluffing, you can say, "No way!" You have to say "No way!" as soon as the player puts the cards down, before the next player plays.

When someone says, "No way!" the last player has to turn over the cards he just played so everyone can see if he was bluffing or telling the truth. If he was bluffing, he has to pick up ALL the cards in the pile in the middle of the table. If he was telling the truth, the person who said "No way!" has to pick up all the cards in the middle of the table.

Sometimes more than 1 person says, "No way!" When that happens, the first person to say "No way!" is the person who checks the cards, and if the player was telling the truth, the first person to say "No way!" picks up all the cards in the middle of the table. If 2 people say "No way!" at the same time, whichever of them is closest on the player's left is the person who checks the cards and picks up the pile if necessary.

When you play your last card, it must be played face up, so everyone can see it. If it is not the right card, pick up the pile.

Activity 30 Tens

This is a kind of solitaire. It helps kids learn all the pairs of numbers that add up to 10.

Deck: Take all the jokers and face cards out of the deck.
Use the cards from ace to 10 only.

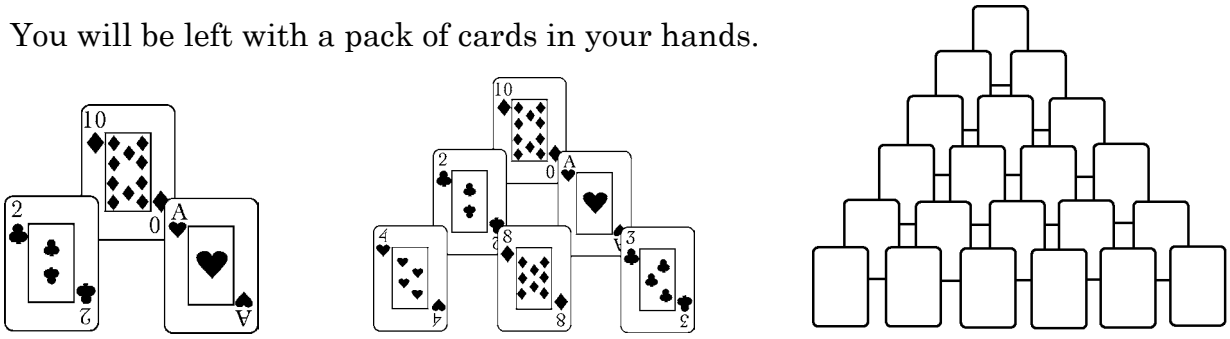
Layout: Lay the cards out face up. Start with 1 card; lay 2 cards on top of it, so that all 3 cards show, but the second row covers the card in the first row.

Then add another row, this time using 3 cards.

Keep adding rows. Each row will take 1 more card than the row before.

Make 6 rows. The last row will take 6 cards.

You will be left with a pack of cards in your hands.



Play

Your job is to take away free cards from the table in sets that add up to 10. A card is free when no part of it is covered by any other card. Look for sets of 2 cards that add up to 10, for example, 5 + 5, or 1 + 9, or 3 + 7, or 4 + 6, or 8 + 2. 10 does not need any other card, since 10 + 0 is 10. Whenever you see a free 10, you can add it to the other sets you have made. If you clear all the cards from the table, you have won!

To make a set, you can take 2 cards from the table, or 1 from the table and 1 from the deck in your hand. As you use the cards from the bottom row, you will free the cards in the next row, and you can use those cards to make sets that add to 10.

If you lift up a card and that frees the card in the row above, you can use both cards to make a set.

First check the layout to see if you can make sets with any free cards. Then turn

over the first 2 cards from the deck in your hand. If you can use the turned up card to make a set of 10, you may do so, or you may decide not to. Your choice. If you use the top card, you can then use the next card, if you like. Then turn over the next 2 cards from the deck in your hand, then the next, and so on. When you have come to the end of the deck, turn it over and start again from the top.

Make it easier

Turn over the cards in your hand one at a time. Set out only 5 rows instead of 6.

Make it harder

Turn over the cards in your hand 3 at a time.

Activity 31 Roll Them and Win!

You need 5 dice to play this game.

Play

Players take turns. When it is your turn, you can roll the dice up to 3 times. Every time you throw the dice, you decide how many dice to keep and how many to throw again. When you have finished throwing the dice, you must fill in one of the boxes on the score sheet. Sometimes you will have to take zero to fill in one of the boxes. You can fill the boxes in any order. You don't have to start at the top.

The Score Card

Bonus: When you have filled in the top 6 boxes, add up your score for those boxes. Did you make 63 or more? Then you get the bonus of 35 points.

Full house: A pair, plus 3 of a kind. For example, a pair of 4's and three 5's.

Small straight: Any 4 numbers in a row. For example, 1, 2, 3, 4 OR 3, 4, 5, 6.

Big straight: Five numbers in a row. 1, 2, 3, 4, 5 OR 2, 3, 4, 5, 6.

Five of a kind: If you get 5 of a kind twice in 1 game, give yourself an extra 100 points.

Roll Them and Win!

	Game 1	Game 2	Game 3
Ones (Add all 1's)			
Twos (Add all 2's)			
Threes (Add all 3's)			
Fours (Add all 4's)			
Fives (Add all 5's)			
Sixes (Add all 6's)			
Total			
Did you get 63 or more? Add 35.			
Score from top part			
3 of a kind (add all dice)			
4 of a kind (add all dice)			
Full House 25			
Small Straight 30			
Big Straight 40			
5 of a kind 50			
Chance (add all dice)			
Total from top part			
Score from top part			
Total for game			

Activity 32 Rumoli

Rumoli is a great game for parents and for families. Many adults like to play this game with their friends, so they have fun playing at a slower pace with their kids. Even the youngest child can "help" an older person play the hand. For little kids, play very slowly and kids will learn to count and recognize the suits. When everyone knows the game well, it goes very quickly and develops skills of strategy and memory.

In a family game, make sure that everyone has lots of chips, so no one runs out. Set an end time that's right for your family—little kids might only play 1 hand, older kids might play 4 hands, or for ½ hour. Adults and young adults might play for an evening.

You need a Rumoli board, a deck of cards, and poker chips.

Start the game

- Divide the poker chips equally among all the players. Take the jokers out of the deck of cards. Put the Rumoli board on the table. For an easier game, put a bowl of snacks on the section marked "poker" and don't use that space for playing. If you want to play the poker pot, see the note below.
- Decide who will deal first. Most people cut the cards. Ace is high.
- Each player puts 1 chip in each section of the board, including the middle.
- The dealer deals out all the cards. He deals a hand for every player, including himself, and also deals an extra hand. This extra hand is called the "missy."
- The dealer looks at his own hand. If it is not a good hand, he can put it away and take the extra hand, the missy. He cannot look at the missy first. If he takes the missy, he cannot go back to his own hand: he must play the missy.

Should I sell the missy? Should I buy it? Players should look at the spaces on the Rumoli board to see what pays, and check their own hands to see if they have any paying cards in it.

- If the dealer decides he doesn't want the missy, he can auction it off to the other players, and keep the chips he is paid for it. The player who buys the missy has to play it. He cannot go back to his first hand.
- The hand that is left over is "dead," and no one can look at it during the hand.

Play the game

- Players sort their hands into suits.
- The player to the left of the dealer picks his lowest card and puts it on the table face up, and calls out the number and suit, for example, "3 of clubs."
- The person who has the next card in that suit plays it in the same way. He puts the card on the table face up and calls out the number and the suit, "4 of clubs." If he has the next 2 cards, he plays them both, and says, "4 and 5 of clubs."
- The person who has the next card in the suit plays it the same way, until you get to the ace of the suit, or until play is broken because nobody has the next card (because it's in the missy).
- The player who played the last card starts again with his lowest card in a suit of a different colour, and plays it in the same way, "6 of hearts." Play continues in the same way. If he does not have a card of a different colour, the next player on the left can play. If no one can play a card of a different colour, the hand is over. Everyone must put 1 chip in the Rumoli pot for every card left in their hand, and the pot stays on the board until the next hand.
- Keep playing until someone plays his last card.
- For the next hand, the deal passes to the next player on the left, and every player puts a chip into every space on the board.

Paying cards

- In the spaces on the board you will see the names of a card or a set of cards. When a player lays down 1 of those paying cards or sets of cards, he picks up all the chips in that space.
- When a player plays his last card, he calls "Rumoli" and the hand is over. That

player collects all the chips in the middle space. Every other player must give the winner one chip for each card he has left in his hand. Losing hands cannot collect chips for paying cards still in the hand.

- At the end of the hand, there will still be chips in some of the spaces on the board. Leave them there until someone wins them. They will get bigger and bigger because every player will add another chip to every space to start every hand.

Playing the poker space

After the cards have been dealt and the missy is taken care of, each player takes the 5 cards in his hand that will make the best poker hand and lays the rest aside while poker is being played. There are 2 ways to play the poker pot:

1. The players can have a "showdown" without betting, raising, or folding. Everyone puts their poker hands face up, and the best hand wins the pot.

or

2. Players can bet and raise and fold as in a regular poker game; all bets are put into the space called "Poker Pot," and the winner of the hand takes the pot.

School Math

All the activities so far help get kids ready for school math. They all build a sense of what numbers are, and help kids learn to solve problems with numbers and patterns. Once kids get in school, they have to learn some “facts.” Addition facts. Subtraction facts. Times tables. They need to know these facts so they can do more things with fractions and decimals and per cents.

All of the card games above are good for learning school math. As well, you can teach your kids to play whatever you like to play—for example, crib or canasta or crazy eights or poker.

The activities on the next pages help with learning and remembering some of those number facts.

Activity 33 A Big Number Walk

This activity will help your child get a mental picture of some big numbers.

- Take a walk around home or school or somewhere your child passes often. Look for buildings or pavements that are made of bricks or concrete blocks, and look for a wall or a section of wall, and count the bricks or blocks.
- Find a part of a building that has about 100 blocks or bricks. It may be a wall, that fences off a yard, or a frame around a window or doorway, or a path to a doorway.
- Find a wall that has about 1,000 bricks or blocks.
- Can you find anything that has 10,000 bricks or blocks?
- Then, when you need a mental picture of a big number, imagine the wall where you found that number of bricks.

Activity 34 The Language of Numbers

The words we use for numbers show something about the parts of the numbers. For example, 16 tells us that the number is 6 plus 10. 17 is 7 + 10 and so on. Here are the numbers in 3 languages. Work with your kids to figure out how the numbers bigger than 10 are connected to the smaller numbers.

English How many?		French Combien?		Hulqu'mi'num Kw'in?	
one	eleven	un	onze	nuts'a'	'apun 'i' kw' nuts'a'
two	twelve	deux	douze	yuse'lu	'apun 'i' kw' yuse'lu
three	thirteen	trois	treize	lhihw	'apun 'i' kw' lhihw
four	fourteen	quatre	quatorze	xu'athun	'apun 'i' kw' xu'athun
five	fifteen	cinq	quinze	lhq'etsus	'apun 'i' kw' lhq'etsus
six	sixteen	six	seize	t'xum	'apun 'i' kw' t'xum
seven	seventeen	sept	dix-sept	tth'a'kwus	'apun 'i' kw' tth'a'kwus
eight	eighteen	huit	dix-huit	te'tsus	'apun 'i' kw' te'tsus
nine	nineteen	neuf	dix-neuf	toohw	'apun 'i' kw' toohw
ten	twenty	dix	vingt	'apun	ts'kw'ush

Do you know the numbers in any other language? How do the words show the relationship between numbers under 10 and from 11 to 20?

Activity 35 Addition Facts: Sums of 10

Make a model to show the sums of 10.

- Lay out 10 counters in a row. The counters could be anything—pennies or macaroni or dice or little cars.

- Move 1 counter over to show 1 + 9 = 10.

- Move another counter over to show 2 + 8 = 10

- Move another counter over to show 3 + 7 = 10

- Continue until you have moved all the counters over to show that 10 + 0 = 10.

Make a poster to show all the sums of 10.

The card game Tens (Activity 30) will give lots of practice with these addition facts.

Activity 36 Addition Facts: Hidden Doubles

When your child can double all the numbers up to 12, that knowledge can help him learn more addition facts easily. You will need 24 counters for this activity. You could use pennies or macaroni or dice or little cars or anything else for counters.

- Use the counters to set up this question for your child: 3 + 5 = ____

- Move 1 of the counters over from the bigger group to the smaller group.

Suddenly, the size of each group is the same, and your child knows the answer because he knows that 4 + 4 = 8. The double was hidden until you moved 1 counter over from the bigger to the smaller group.

- Use the counters to set up another hidden double for your child: 5 + 7 = ____

- Move 1 of the counters over from the bigger group to the smaller group.

Suddenly, the size of each group is the same, and your child knows the answer because he knows that 6 + 6 = 12. The double was hidden until you moved 1 counter over from the bigger to the smaller group.

- Ask your child to use the counters to find some other hidden doubles. She may find 1 + 3, and 2 + 4 and 4 + 6 and 5 + 7 and 6 + 8 and 7 + 9 and 8 + 10 and 9 + 11 and 11 + 13. Write them down as she finds them. Some of these addition facts are

hard to remember, but if you think of them as hidden doubles, they are easy.

- Look at all the hidden doubles you have written down. See if you can see the pattern. For example: 1 + 3. Look at the first number and count: 1, 2, 3. The middle number, the one you DON'T see in the question, is the number you double to get the answer. Another example is 4 + 6. Look at the smaller number and count up: 4, 5, 6. The middle number, the one you DON'T see in the question, is the number you double to get the answer.

Make a poster to show the hidden doubles.

Activity 37 Addition Facts: Nearly Double

Use what you know about doubles to find the answers.

- Use the counters to set up this question for your child: 3 + 4 = ____

- Move 1 of the counters away from the bigger group.

- Do you see the double 3? Push them together to show the total of 6.

- Add the 1 back in, to show 7 in all.

- Set up a harder question: 7 + 8 = ___.

- Move 1 of the counters away from the bigger group.

- Do you see the double 7? Push them together to show the total of 14.

- Add the 1 back in, to show 15 in all.

- Ask your child to use the counters to find some other sums that are nearly doubles. She may find 6 + 5 and 3 + 4 and 8 + 9 and 10 + 11. Write them down as she finds them. Some of these addition facts are hard to remember, but if you think of them as nearly doubles, they are easy.
- Look at all the nearly doubles you have written down. See if you can see the pattern.

Make a poster to show the near doubles.

Activity 38 Numbers Up and Down

The game can be used by kids with a range of adding and subtracting skills. The most important thing is to make it fun. Kids can play at a less skillful level by counting out their turns, while parents can model higher level skills by thinking out loud as they take their turn. When the kids are ready, they'll start to use the skills that their parents model.

This game depends totally on luck, with no strategy involved. This means that little kids have as much chance of winning as bigger kids or parents.

- Copy the game board on the next page onto heavy cardboard.
- You will need 1 dice for the easy versions, 2 for the harder versions, and a game piece for each player (could be a coin or a button or anything that will fit on the squares).
- Play: Throw the dice to see who goes first. The player with the highest number starts. The first player throws 1 dice, and moves his game piece forward the number of squares thrown. The next person takes a turn and does the same. The first person to get past 100 wins the game.

Make it easier

Cut the game board off at square 50. The game will be shorter.

Make it harder

Start at square 100, throw the dice, and count down or subtract. First one to get past 1 is the winner.

Use 2 dice for the game. The numbers to count and add or subtract will be bigger.

Use 2 dice of different colours. Each player throws both dice, and moves the game piece forward the number on the white dice and backward the number on the red dice.

Model higher math skills

Think out loud as you play your turn. Here are some examples.

- If the child is at the level of counting out every play, you might say, "I'm on square 22 and I threw a 5. 2 + 5 is 7. I think I'll land on square 27. Let's see. I'll count 1, 2, 3, 4, 5—and look where I am. I was right!" (And you could be wrong, sometimes, too.)
- If the child can do some adding, but has a hard time with the bigger numbers, show him some strategies by thinking out loud on your turn. Some examples:

  "I'm on square 29 and I threw 11. Let's see. First I'll add the 10. That makes 39. Then I'll add the 1. That's 40. So let me check. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10—that's 39 and 1 more is 40. I was right!"

  "I'm on square 47 and I threw a 9. Let's see. I'll add 10 and subtract 1, and that should be the same as adding 9. Okay, 47 plus 10 is 57, subtract 1 is 56. So let me check. I'll count up. 1, 2, 3, 4, 5, 6, 7, 8, 9—and here I am at 56. I was right!"

Start Here

1	2	3	4	5	6	7	8	9	10	11
22	21	20	19	18	17	16	15	14	13	12
23	24	25	26	27	28	29	30	31	32	33
44	43	42	41	40	39	38	37	36	35	34
45	46	47	48	49	50	51	52	53	54	55
66	65	64	63	62	61	60	59	58	57	56
67	68	69	70	71	72	73	74	75	76	77
88	87	86	85	84	83	82	81	80	79	78
89	90	91	92	93	94	95	96	97	98	99

100

Activity 39 Double, Double...

How many folds can you make?

You will need a large sheet of paper (like the outside sheet of a newspaper).

- Double it over (fold it in half). How many layers are there? Can you tear it along the fold?
- Double it again. How many layers? Can you tear it along the fold?
- Double it again. How many layers? Can you tear it along the fold?
- Keep doubling it and counting the layers. How many doubles will it take before you can't tear it any more? How many layers of paper is that?

How far can you go?

You will need an egg carton and a bag of unpopped popcorn, dried beans, or macaroni. (The smaller the item, the farther you have to count before the cup is too full to hold the next double.)

- Put a piece of popcorn or macaroni or a bean in the first egg cup.
- Double that in the second cup (2 pieces).
- Double that in the third cup (4 pieces).
- Keep on doubling the pieces as you move from cup to cup. How far can you go before the cup is too small to hold all the pieces?

Double the money

See the section on money (Activity 13) for a real-life lesson on doubling.

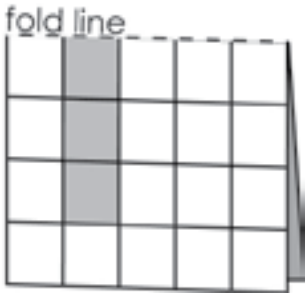
Activity 40 Two Times Table

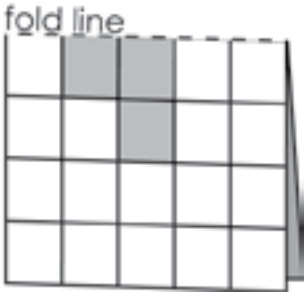
For the two times table, double to get the answer.

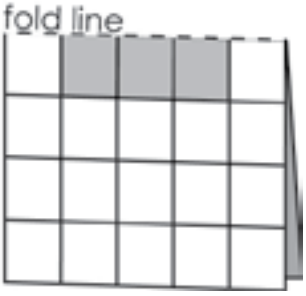
To show the 2 times tables, you will need some sheets of regular graph paper, or the paper on the next page, which has larger squares.

- Fold the paper along any line.
- Colour in 1 square along the fold. Cut out the square, but don't cut along the fold line. Open it up. What do you see? Two squares. 2 × 1 = 2. Double 1 is 2.
- Back at the folded paper. Colour in 2 squares along the fold. Cut out the squares. Open it up. What do you see? Four squares. 2 × 2 = 4. Double 2 is 4.
- Back at the folded paper. Colour in 3 squares along the fold. Cut out the squares. Open it up. What do you see? Six squares. 2 × 3 = 6. Double 3 is 6. And so on.
- Make a display of the cut-outs, each one marked with its number sentence, for example, 2 × 3 = 6.

Kids may want to colour the other half a different colour as it is revealed. It doesn't matter what shape the initial coloured block is, so long as at least 1 square is along the fold. Any of the following will be good:







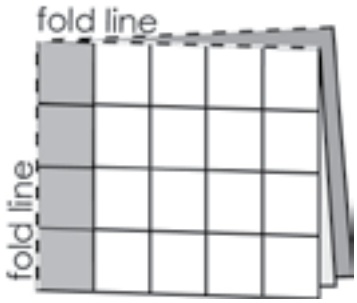
Activity 41 Four Times Table

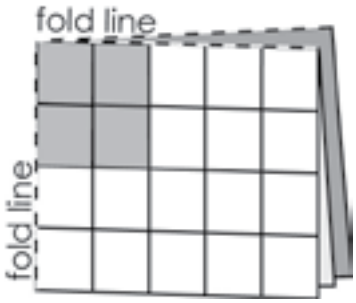
The four times table is double, double!

You will need some regular graph paper, or the paper on the next page, which has larger squares.

- Fold the paper along any line that goes across the page. Then fold again on any line that goes up and down.
- Start at the point of the double fold. Colour in 1 square. Cut out the square, through all the layers. Open the first fold. Double 1 is 2. Colour the 1 square that has just been opened up. Open the second fold. Double again is 4. $4 \times 1 = 4$. Double 1, then double again. Colour the two 1's that have been opened up.
- Back at the flat paper. Double the paper twice, as before. Start at the point of the double fold. Colour in 2 squares. Cut out the squares, through all the layers. Open the first fold. Double 2 is 4. Colour the 2 squares that have just been opened up. Open the second fold. Double again is 8. $4 \times 2 = 8$. Double 2, then double again. Colour the two 2's that have been opened up.
- Back at the flat paper. Double the paper twice, as before. Start at the point of the double fold. Colour in 3 squares. Cut out the squares, through all the layers. Open the first fold. Double 3 is 6. Colour the 3 that have just been opened up. Open the second fold. Double again is 12. $4 \times 3 = 12$. Double 3, then double again. Colour the two 3's that have been opened up. And so on.
- Make a display of the cut-outs, each one marked with its number sentence.

It doesn't matter what shape the initial coloured block is, so long as at least 1 square is on both fold lines:



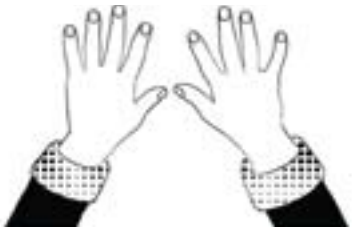


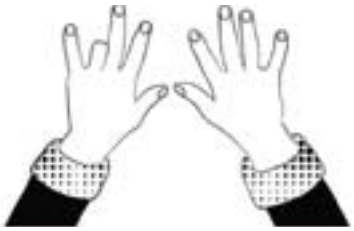
Activity 42 Nine Times Table

Read your hands for the nine times table

The special pattern of the 9 times tables lets us use our fingers to read the answers. Follow the drawings on your own fingers:

Lay your hands flat on the table.





Think about 2 × 9. Start from the left and count each finger. When you get to 2, tuck that finger down. Then you can read the answer to the question. Count the fingers to the left of the finger you tucked in. That is the first digit. Count the fingers to the right of the finger tucked in. That is the second digit. Count your thumbs as fingers. (Never count the finger you tuck in; it just separates the first digit from the second digit.)

Let's do one more, 4 × 9 = _____

Lay your hands flat on the table. Think about 4 × 9. Start from the left and count each finger. When you get to 4, tuck that finger down. Read your hands: 3 to the left of the tucked finger and 6 to the right of the tucked finger. Answer: 36. (Remember not to count what you tuck in; it just separates the first digit from the second digit.) Count your thumbs as fingers.

$5 \times 9 =$ _____

Lay your hands flat on the table. Think about 5×9. Start from the left and count each finger. When you get to 5 (your left thumb), tuck it down. Read your hands: 4 to the left of the tucked thumb, and 5 to the right of the tucked thumb. Answer: 45. (Remember not to count what you tuck in; it just separates the first digit from the second digit.)

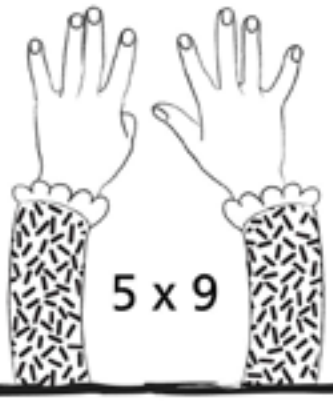
Nine Times Table

- **count from the left**
- **tuck**
- **read your hands**

What is 4 x 9?

- Starting from your pinky on your left hand, count to 4. When you reach your 4th finger, tuck it under.
- How many fingers are still sticking out, to the left of your tucked-in finger? (3)
- How many fingers are sticking out to the right of your tucked-in finger (on both hands, and don't forget to include your thumbs!)? (6)
- When you put 3 and 6 side-by-side, you get 36!

  Yes, 4 x 9 is **36**!



Appendix A

Making a Book

You could make a book with your child, or help an older child make a book for a younger child. There are many ways of making a book.

Report Cover

A report cover is a clear plastic folder with a plastic spine that holds pages you put inside the folder. Buy them anywhere you buy school supplies. They are great for use with either plain paper or card stock. If you are using cardstock, score it down the left margin, making a strip just a little wider than the plastic binder strip that comes with the report folder. This will allow the card stock pages to open easily.

Folded and Stapled Book

If you have a stapler with a long arm, start by folding each sheet of paper, and the cover, in half. Open the sheets, pile them up on top of each other, and use the stapler to put 2 or 3 staples along the fold line. Then fold the book closed. The staple should have the smooth side on the outside of the book. Usually this means you would lay the pages in the stapler with the fold up.

Book with Brads or Rings

If you are using card stock for the cover or the inside pages, score the cardstock down the left side of each page, 2 or 3 cm from the edge. Use the margin to punch holes for the rings, or to place the brads. The score lines will help the book open easily. Paper does not have to be scored.

Appendix B
Books

These are arranged by subject. The ones with aboriginal content are marked with a star (*).

Card Games

Card Games for Smart Kids by Margie Golick. Sterling Publishing Co., Inc., 1998.

Deal Me In! The Use of Playing Cards in Learning and Teaching by Margie Golick. J. Norton Publishers, 1988.

Counting Books

Bea's 4 Bears by Martha Weston. Clarion Books, 1992. Counts from 4 to 0 and back up.

**Colours of the Islands* by Dawn Adams. Faculty of Education, University of B.C. Counts animals of the northwest coast from 1 to 10.

I Spy Two Eyes: Numbers in Art by Lucy Micklethwait. Greenwillow Books, 1993. Counts 1–20.

Next Please by Ernst Jandl and Norman Junge. Hutchinson, 2001. Counts from 5 down as various toys wait to see the doctor.

No Dodos: A Counting Book of Endangered Animals by Amanda Wallwork. Scholastic, 1993. Counts from 10 to 0.

One Big Building: A Counting Book about Construction by Michael Dahl. Picture

Window Books, 2004. Counts 1–12.

One Is a Drummer: A Book of Numbers by Roseanne Thong. Chronicle Books, 2004. Counts from 1 to 10.

Six Snowy Sheep by Judith Ross Enderle and Stephanie Gordon Tessler. Puffin Books, 1994. This tongue twister counts down from 6.

Spinderella by Julia Donaldson. Crabtree, 2006. A spider discovers the joy of numbers.

Ten Cats Have Hats: A Counting Book by Jean Marzollo. Scholastic, 1994. Counts 1 to 10.

Ten Go Tango! by Arthur Dorros. HarperCollins, 2000. Ten sets of animals do different dances.

Ten Little Angels by Andra Simmons. Harcourt, 2001. Counts 1 to 10.

Ten Sly Piranhas: A Counting Story in Reverse, a Tale of Wickedness and Worse! by William Wise. Penguin, 1993. Counts back from 10 to 0.

**Thirteen Moons on Turtle's Back: A Native American Year of Moons* by Joseph Bruchac and Jonathan London. Philomel Books. The 13 months of the lunar calendar.

The Timbertoes 1 2 3 Counting Book. Boyds Mills Press, 1997. A family goes through the day from 1 to 12.

Shapes

Cones by Nathan Olson. Capstone Press, 2008. *Cubes* and *Cylinders* and *Pyramids* and *Spheres* are four other books by the same author.

**Long Ago Sewing We Will Remember: The Story of the Gwich'in Traditional Caribou Skin Clothing Project* by Judy Thompson. Canadian Museum of Civilization, 2005. Includes patterns for traditional clothing and beadwork.

Round and Round and Round by Tana Hoban. Greenwillow Books, 1983. Large colour photos of things you see every day that are round. No words. Two similar books by the same author are *So Many Circles, So Many Squares* and *Circles, Triangles, and Squares*.

Shapes by Ivan Bulloch. Action Math Series. Thomson Learning, 1994.

The Shapes We Eat by Simone T. Ribke. Children's Press, 2005.

Triangles by Sarah Schuette. Capstone Press, 2003.

Homework

How to Do Homework without Throwing Up by Trevor Romain. Free Spirit, 1997. Funny book that gives helpful advice about doing homework. See also the video by the same name.

Research ate my brain: the panic-proof guide to surviving homework. Toronto Public Library. Annick Press, 2005.

Surviving Homework: Tips from Teens by Amy Nathan. Millbrook Press, 1996. The book offers tips from 300 top high school juniors and seniors.

Other Math Ideas

Big Numbers: And Pictures That Show Just How Big They Are! by Edward Packard. Millbrook Press, 2000.

Each Orange Had 8 Slices: A Counting Book by Paul Giganti, Jr. Greenwillow Books, 1992. Counting or multiplying the parts of things. For example, a page with several clowns, each holding bunches of balloons asks, "How many clowns? How many bunches of balloons? How many balloons?"

The Great Math Tattle Battle by Anne Bowen. A. Whitman, 2006. Two kids learn to stop tattling while doing math.

Hat Tricks Count: A Hockey Number Book by Matt Napier. Sleeping Bear Press, 2005. Numbers introduce rules, history and famous names in hockey.

Math for Smarty Pants by Marilyn Burns. Little, Brown, 1982. Lots of puzzles and patterns and things to do for kids who are good readers.

Mission Addition by Loreen Leedy. Holiday House, 1997. A class gets introduced to addition facts and solves a mystery.

The Mission of Addition by Brian P. Cleary. Millbrook Press, 2005. Fun ways to learn addition.

One More Bunny: Adding from One to Ten by Rick Walton. Harper Festival, 2001. Addition facts 1 to 10.

Sir Cumference and the Great Knight of Angleland: A Math Adventure by Cindy Neuschwander. Charlesbrige, 2001. A boy goes on a quest and uses angles to find his way through the forest and into the dungeon. There are other math adventures with Sir Cumference by the same author.

Slumber Party Problem Solving by Brian Sargent. Children's Press, 2006. A young girl gets ready for a sleep-over by figuring out how many sleeping bags, stuffed toys, pizza, etc. she'll need for herself and 3 guests.

Subtracting and Taking Away by Richard Leffingwell. Heinemann Library, 2006.

The Sundae Scoop by Stuart J. Murphy. Harper Collins, 2003. Possible combinations of ice cream, sauce and topping.

Ten Times Better by Richard Michelson. Marshall Cavendish, 2000. Numbers 1 to 10 each multiplied by 10 as animals vie to be bigger and better.

Too Many Kangaroo Things to Do by Stuart J. Murphy. Harper Collins, 1996. Australian animals throw a birthday party for the kangaroo. Introduces the 1, 2, 3, and 4 times tables up to 4 × 4.

Appendix C

Online Links

The following are interactive sites, not places to print out worksheets. These are arranged by subject. The ones with aboriginal content are marked with a star (*).

Beading

Aunt Molly's Bead Street. http://home.flash.net/~mjtafoya/home.htm

*Beadwork designer. Native Tech Native American Technology and Art. Design a bead or loom project. http://www.nativetech.org/beadwork/beadgraph/index.html

Big Numbers

The MegaPenny Project. Kokogiak Media. An award-winning site with lots of ways to look at big numbers. http://www.kokogiak.com/megapenny/nineteen.asp

Charts and Graphs

National Center for Education Statistics, US Department of Education
http://nces.ed.gov/nceskids/createagraph/default.aspx

National Library of Virtual Manipulatives. Utah State University
http://nlvm.usu.edu/en/nav/frames_asid_323_g_1_t_5.html

Games

*Basket Concentration. http://www.nativetech.org/basketry/gameindex.html

Change Maker. FunBrain. http://fen.funbrain.com/cashreg/index.html

Frog Puzzle. David Hallam. Move the frogs to the other side of the pond. http://www.hellam.net/maths2000/frogs.html

Fun Brain. Pearson Education. http://fen.funbrain.com/brain/MathBrain/MathBrain.html

Math Cats. Wendy A. Petti. http://www.mathcats.com/

*Math Central, University of Regina. http://mathcentral.uregina.ca/RR/database/RR.09.00/treptau1/index.html

*Native American Technology and Art. http://nativetech.org/games/index.php

Stock Market. Nova. http://www.pbs.org/wgbh/nova/stockmarket/virtual.html

Models and Demonstrations

National Council of Teachers of Mathematics http://illuminations.nctm.org/ActivitySearch.aspx

National Library of Virtual Manipulatives. Utah State University. http://nlvm.usu.edu/

$a^2 + b^2 = c^2$. Nova. http://www.pbs.org/wgbh/nova/proof/puzzle/theorem.html

$(a + b)^2$. NCTM. http://illuminations.nctm.org/ActivityDetail.aspx?ID=127

Number Operations (Add, Subtract, Multiply, Divide)

Wendy Sawatsky. University of Regina. Check the section on numbers and operations for games to play. http://mathcentral.uregina.ca/RR/database/RR.09.99/sawatzky1/

A plus Math. http://www.aplusmath.com/Games/index.html

Origami

Rick Nordal. http://www.geocities.com/snowflakegame/

Per Cents

David Hallam. Estimate what per cent of a bar is shaded.
http://mathematics.hellam.net/maths2000/percent1.html

David Hallam. Estimate what per cent of a pie is shaded.
http://www.interactivestuff.org/sums4fun/pietest.html

Rhymes and Songs

KIDiddles. If you search the word "one" you will find many number songs and rhymes. www.kididdles.com/mouseum

*NWT Literacy Council.
http://www.nwt.literacy.ca/famlit/123rhyme/rhymes/rhymes.pdf

Telling Time

Matching game by David Hallam. Matches face clocks to digital clock times.
http://www.interactivestuff.org/match/maker.phtml?featured=1&id=12

Appendix D

DVDs and Videos

The following list of math DVDs and videos has been roughly divided according to grade level. The best way to find math DVDs and videos for kids is to ask at your local library. You don't have to pay to borrow them, and usually you can have them for about a week. If you'd like to see one from the list below, ask your librarian to get it for you by inter-library loan.

Pre-school Children

JibberBoosh, Brain Games & *Silly Stuff*. 2002. Cerebellum Corp. 30 min.

Math Circus. 2004. Warner Home Video. 35 min.

Mickey's Reading & Math Fun; Mickey and the Beanstalk. 2005. Walt Disney Home Entertainment. 78 min.

Kindergarten to about Grade 3

Count on Math. 2004. Disney. A series by Disney Educational Productions. Titles include *Exploring Geometry*, 36 min.; *Organizing Data*, 13 min.; *Solving Equations*, 12 min.

Donald in Mathmagic Land. Disney Educational Productions. 2004, 1959. 26 min.

Get Ready for Math. Western Publishing Company. c1986. Golden Book Video. 27 min.

Math for Children. 2004. A series produced by Stone House Productions, Schlessinger Media,. Titles include *Addition*, *Division*, *Fractions*, *Geometry*, *Measurement*, *Money*, *Multiplication*, *Number Sense*, *Subtraction*, *Telling Time*.

**Thirteen Moons on Turtle's Back*. 1992. Retold by Joseph Bruchac and Jonathan London. Spoken Arts. 17 min.

Working with Numbers. 1991. Western Publishing Company. Golden Book Video. 30 min.

Grade 4 and Up

Basic Math (The Zany World of Basic Math). 1997. Cerebellum Corp. 105 min.

Cyberchase. Totally Rad. 2004. PBS Kids. 80 min.

Hip Hop Homeroom: Math Made Fun. 2006. Blast Films. 40 min.

Math Challenge. 2004. The series features Dr. Strangeglove and secret agent Matt Mattics. Titles include Decimals, Equations, Fractions, Percentages. 10–15 min. each.

Math Curse. 1998. Canadian Learning Company. 30 min.

Math—Who Needs It! with Jaime Escalante. 1991. FASE Productions. 58 min.

How to Do Homework without Throwing Up. 2004 Comical Sense Co. See also the book of the same name by Trevor Romain.

For Teachers and Parents

Thinking with Numbers. 2007. WGBH Boston Video. 404 min.