Educational Play

MATH GAMES and Activities FOR YOUR CHILD

REVISED EDITION

Deborah Valentine

Royal Fireworks Press
Unionville, New York

Dedication

To my mother,
Lois Aldennan Leslie,
with love and admiration

Royal Fireworks Press
P.O. Box 399
41 First Avenue
Unionville, NY 10988-0399
(845) 726-4444
fax: (845) 726-3824
email: mail@rfwp.com
website: rfwp.com

ISBN: 978-0-88092-607-2

Publisher: Dr. T.M. Kemnitz
Editor: Jennifer Ault
Book and Cover Designer: Kerri Ann Ruhl

Printed and bound in Unionville, New York, on acid-free paper
using vegetable-based inks at the Royal Fireworks facility. 2ap21

local 363

Table of Contents

Acknowledgments v

Introduction 1

Chapter One: Someone's in the Kitchen 5
- Activity #l: Making a Banana Sandwich 8
- Activity #2: Kookie Faces 10
- Activity #3: Double or Nothing 12
- Activity #4: Half-sies 14
- Activity #5: Play Clay 16

Chapter Two: Let's Start Calculating 19
- Activity #1: Calculator Riddles 21
- Activity #2: Calculator Counting 23
- Activity #3: Multiply the Fun with Calculators 25
- Activity #4: Let's Turn It Around 27
- Activity #5: Number Rows 29
- Activity #6: Check the Check (Consumer Math) 31
- Activity #7: What's My Sign? 34
- Activity #8: Let's Play School 36
- Activity #9: Place Is Important 38
- Activity #10: Multiple-Step Problem Solving 40

Chapter Three: Measuring Up 42
- Activity #1: In My Estimation (Time) 44
- Activity #2: In Actuality (Time) 46
- Activity #3: Time-Go (Time) 50
- Activity #4: Estimating How Far (Distance) 51
- Activity #5: Measuring How Far (Distance) 54

Activity #6: How Much? (Volume) 57
Activity #7: Measuring Games Involving Math 60

Chapter Four: Garage Sale Math 64
Activity #1: Taking Inventory 66
Activity #2: Collecting Items to Sell 68
Activity #3: Getting Ready for the Sale 70
Activity #4: The Big Day 73
Activity #5: The Fun Part 75

Chapter Five: Financial Literacy 78
Activity #1: What Is Money? 80
Activity #2: Making Allowances 81
Activity #3: Pretend Checking Account 83
Activity #4: Sparking Interest 85
Activity #5: Better Be Insured 87
Activity #6: Business in Real Life 89
Activity #7: Supply and Demand 90
Activity #8: Let's Mint a Few 92

Chapter Six: Budgets 94
Activity #1: Gift-Giving Budget 96
Activity #2: Gift-Giving Budget Game 98
Activity #3: Budgeting Time 99

Chapter Seven: Tangram Puzzle 101

Chapter Eight: Scavenger Hunt Math 106

Chapter Nine: Math Games for the Road 109

Conclusion 123

About the Author 124

Acknowledgments

I would like to acknowledge the invaluable assistance of my two readers, Bonnie M. Hodge, for the perspective of a secondary teacher, and Judith M. Tarter, for the point of view of an elementary school teacher. Some of their comments appear in the book and are designated by their initials.

In addition, I would like to acknowledge the assistance of a new friend, Margaret Breiner, who allowed me to use her "idea notebook" in my research and who shared the valuable expertise of a master teacher.

To the many librarians who freely gave their time to assist me in my research, I say a heartfelt thanks. You are the unsung heroes in the publishing industry.

Through the years, teachers and parents, too numerous to mention by name, have shared creative teaching and parenting ideas with me during my lectures and workshops. My debt to them is immense.

And not least, thanks to my loving family, Howard, Ann Larie, and William Valentine, for the encouragement to succeed and for letting go of me when I needed time and space to complete the project.

Introduction

Welcome to *Educational Play: Math Games and Activities for Your Child.* You are about to enter a book of exciting adventures in the field of mathematics. The quality time that you will be spending with your child (an average of ten to twenty minutes per activity) could well make the difference in your child's attitude toward and experience with mathematics in school.

You do not have to be well-versed in mathematics to participate in these activities with your child, but a positive attitude is essential. Avoid telling your child, for example, that you have always been terrible in math. Similarly, if you begin each session by saying, "Let's get to work," you are likely to be met with groans. Instead, begin by saying, for example, "I have twenty minutes free. Do you want to play a game with me?" Your enthusiasm is a key element in the success of each activity.

Keep your sessions with your child brief and spontaneous. Many of the activities in this book are ideal to do during time that otherwise would be wasted, such as while waiting in the checkout line at the grocery store or while waiting at the doctor's office. Especially if you have more than one child, you know from experience that these are the times that can try a parent's soul. Suggesting a game can put an end to the complaining or bickering, particularly when the game you choose is noncompetitive, as many in this book are.

In addition, several of the activities in this book provide children with a productive way to spend their time in the car. There's even an entire chapter of such activities and

games. When you're driving through traffic listening to squabbling children, redirecting their focus to an interesting or challenging game can offer the adults in the car some much-needed relief.

While the activities and games in this book offer useful ways to fill time, however, it is a good idea to dedicate time with your child to doing constructive activities. During the summer months, I set aside an hour each morning to work with or beside my children on games or projects in a variety of subjects and skill areas. Because I set a regular time each day, my children expect it, and they look forward to our time together. Try to set aside time each day, perhaps only fifteen minutes during the school year or as much as an hour during the summer, to work and play with your child in a moderately structured way.

Because different children have different interests, and because different approaches work with different children, I have included extension activities or variations on several of the activities in this book. Feel free to modify any of the suggestions so that the activities better suit your child. No one knows your child better than you. Consequently, no one can predict what approach will work with your child better than you can.

In addition to the activities outlined in this book, many board games and card games offer practice in computation, logic, and finance. Spend time with your child learning and playing these games. You may already own some of the classics, such as Monopoly, dominoes, or chess. But even beyond these, there are innumerable ways to bring math

into a child's everyday life. There are suggestions sprinkled throughout the text of this book to give you some ideas.

Sometimes ideas for integrating math into a situation or even into a daily routine will come from the child him- or herself. In fact, even very young children may have ideas for new math games or activities. If a child thinks up a new game, play it, even if the rules seem illogical. Through trial and error, the child will see the inconsistencies or problems and begin to sort them out.

You may want to read the entire text of this book before you begin working with your child. If you do, you might find that you want to skip over certain chapters or parts of chapters for which your child is not yet ready. It can help to make notes for yourself during the first reading. You can write down additional ideas that the reading stimulates, as well as a possible time schedule for initiating the various activities. More importantly, however, you will find yourself more attuned to the myriad ways in which you can teach mathematics every day to your child.

If you do not have the time or energy to do a complete read-through, don't worry. Most of the activities are easy to understand and quick to implement. Every time you work through an activity, you are nurturing your child's intellectual growth. As a bonus, you will find your own mind stretching as you and your child play together in an educational way. And even more important than the intellectual stimulation, you will be sharing quality time with your most prized joy, your child. Good luck to you as you strive to motivate and educate your child.

Chapter One

Someone's in the Kitchen

Overview

Nowhere in the home do so many math activities take place as in the kitchen. And the motivation is built in: children get a treat to eat at the completion of each activity! Be sure to tailor the activities in this chapter to the age and readiness of your child.

Kitchen math also provides real-world experiences in a one-to-one setting that are hard to duplicate in the classroom. As such, parents who take the time to help their children discover math facts in the kitchen are building an important foundation for school math experiences. (J.T.)

Have fun, and *bon appetite!*

Objectives

1. To help children practice basic math facts
2. To teach children about solid and liquid measurements
3. To help children become familiar with and practice using fractions
4. To teach children to follow directions but also to help them understand that sometimes it can be advantageous to deviate from the directions
5. To help children develop creativity

Introduction and Preparation

1. Before you undertake any of the activities in this chapter, invite your child to visit with you as you prepare a meal. Don't worry if his or her attention span seems short. More than likely, the child will be in and out, asking questions or responding to yours, watching for a while and then scooting off to other pursuits.

2. When you're ready to add an ingredient, ask the child to help. You might stir while he or she pours. You might say, "Before you put that in, let's check to see if we have ¾ cup of flour." You may need to say, "Look for the number 3, a slash mark, and then the number 4."

3. To prepare the child to understand the economics of food preparation, make statements such as, "Bananas were on sale today, so I thought I'd make banana bread for dessert tonight."

4. When you make a substitution in a recipe, be sure to make note of it: "The recipe called for fresh strawberries, but we don't have any, so I'm going to cut up peaches instead. How do you think that will work?"

5. If you change a recipe, point that out to the child. Say, for example, "Last time I made this, the onions overpowered everything else. I think I'll use ¼ cup instead of ½ cup this time." Children need to know right from the start that recipes can be changed and new ones invented. Even if you've never been bold

enough to change a recipe, let your child learn early that in the kitchen, anything is possible. (J.T.)

Note: *Substituting ¼ cup for ½ cup is a concrete demonstration of the quantity of fractions. Many children think ¼ is bigger than ½ because 4 is bigger than 2. It is only with hands-on experiences like this one that later computation with fractions on paper can be meaningful. (J.T.)*

Note: *When dealing with fractions, emphasize that the fractional part always relates to the whole. For example, ¼ of a pizza will not be the same size as ¼ of a banana. (B.H.)*

Activities

ACTIVITY #1
Making a Banana Sandwich

Skills

Fractions, predicting, recognizing patterns

Materials

2 slices of bread, 1 banana, mayonnaise or peanut butter, 2 table knives

Steps

1. Together with the child, collect the ingredients.
2. Instruct the child to spread the mayonnaise/peanut butter on one piece of bread while you spread it on the other piece.
3. Say, "Now let's cut the banana in half." The child should cut the banana crosswise through the center.
4. Say, "Now let's cut each half in half, which will give us fourths." The child can take one half of the banana and cut it in half, while you cut the other half to make fourths.
5. Say, "Now, we'll cut it in eighths. How many pieces do you predict we'll have when we've made these cuts?" Be sure to ask the child to predict each time you make another cut. You cut your two fourths, and the child can cut the other two.
6. Continue with sixteenths and thirty-seconds if necessary to get the banana into enough little rounds to fill the sandwich. Point out how many pieces you

end up with for each division (four with fourths, eight with eighths, etc.).

7. Say, "Let's see how many sixteenths/thirty-seconds it takes to fill one slice of bread." Count them, and use the correct fraction terminology, such as, "It took nine sixteenths." Then ask how many are left. Let the child calculate or count the remainder.

8. Ask, "What should we do with the seven sixteenths that are left?" Be open to suggestions, but the child will probably want to share them and eat them. Say, "Okay, let's divide the seven sixteenths between us. Will we each get an equal number of banana rounds?"

9. Finish making the sandwich, cut it in half, and enjoy!

Optional Extensions

1. Try the same procedure using foods such as cucumbers or hot dogs.

2. The next time you slice a pie or a pizza, practice the halves-into-fourths-into-eighths method. If you have five guests, ask the child to predict how best to slice the pie. Encourage the child to make a drawing and to practice "slicing" (i.e., drawing lines where slices will be made and then counting the slices for accuracy). If the food to be cut is rectangular, ask how the cut should be made if each person is to have at least two pieces. Remember, there are several right answers. A gifted child may wish to begin with a long diagonal cut. Such creative approaches to problem solving are essential when it comes to geometry and other advanced mathematics.