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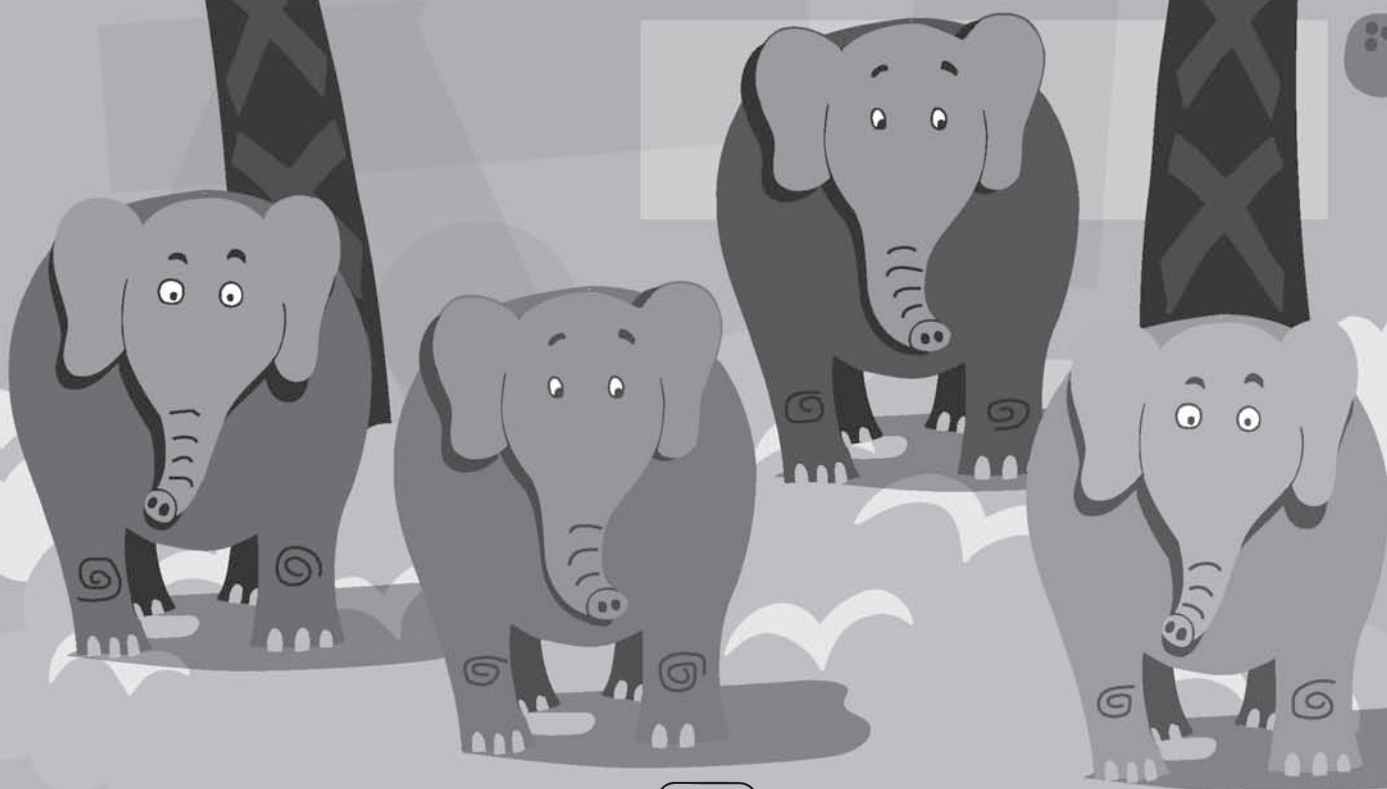
# MATH POETRY

Linking Language and Math in a Fresh Way

Betsy Franco

One elephant has four legs  
If you have three other elephants  
Sixteen legs would make . . .

**A STAMPEDE!**



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Cover design: Sean O'Neill  
Interior design: Dan Miedaner  
Back cover student drawings: Ilse Nuñez, Minji Choi, and Jane Suk

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ISBN-10 1-59647-072-0  
ISBN-13 978-1-59647-072-9  
ISBN-eBook: 978-1-59647-143-6

1 2 3 4 5 6 7 8 9 - MG - 09 08 07 06

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### Library of Congress Cataloging-in-Publication Data

Franco, Betsy

Math poetry : linking language and math in a fresh way / Betsy Franco.

p. cm.

Includes bibliographical references.

ISBN-13: 978-1-59647-072-9 (alk. paper)

ISBN-10: 1-59647-072-0 (alk. paper)

1. Mathematics--Study and teaching (Elementary) 2. Poetry in mathematics education.  
3. Mathematics--Juvenile poetry. 4. Children's poetry, America. I. Title

QA135.6.F728 2006  
372.7--dc22

2006041115

# Dedication

For Bob Grumman who woke me up to math poetry with his beautiful “long division poetry” and “mathmakus.”

# Acknowledgments

Thank you to all the creative children at El Carmelo Elementary School who wrote the poems throughout the book. I am also very grateful to their teachers who let me try out the Poetry Frames in their classrooms and gave me excellent suggestions:

Alice Anne Chandler, *grade 3*

Annette Isaacson, *ELL*

Gaelyn Mason, *grade 5*

Sarah Newman, *grade 2*

Janeen Swan, *grade 4*

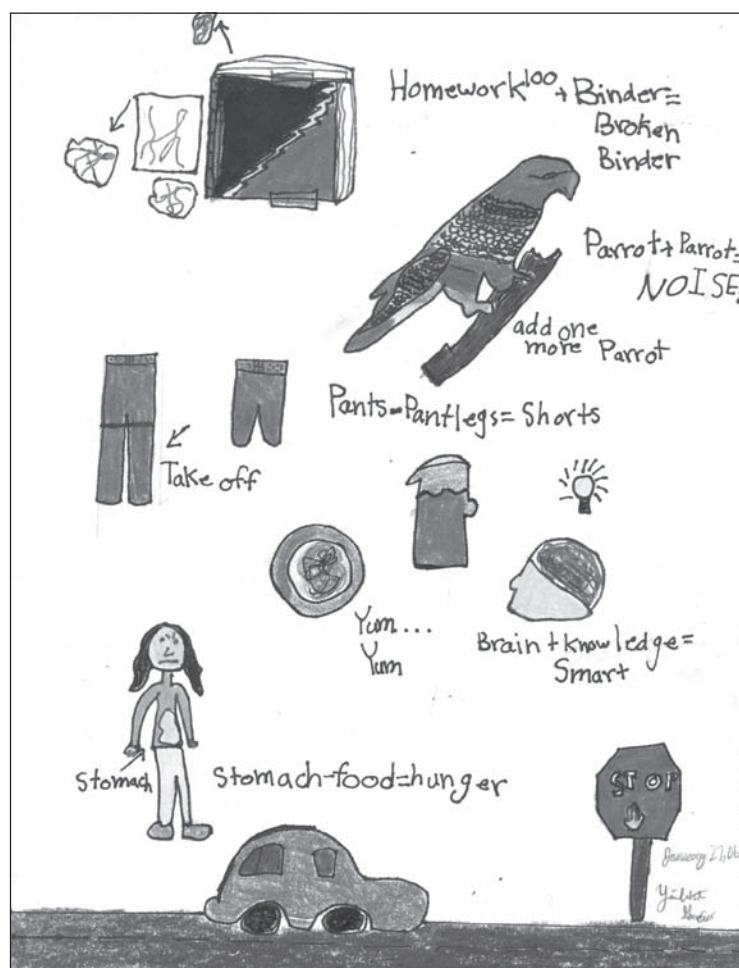
Thank you to the children at Barron Park Elementary School who did such a beautiful job writing and illustrating math poems based on a theme—and to their teachers, Larry Wong, Shari, McDaniel, and Patrick Lewis.

Ryan Peterson at JLS Middle School gave me the idea to write mathematickles about algebra. I am most grateful to him for this wonderful idea.

# Preface

At a very early age, children start to identify with either a verbal or logical way of thinking. They say, “I’m not good at math, but I like to write,” or “I hate to write, but I love math.” Fortunately, when children write math poetry, they invariably surprise themselves. They find parts of themselves they didn’t realize existed. Every time it happens, it’s a thrilling phenomenon to watch.

Now it’s time for you and your students to embark on your own adventure—writing creative math poetry that will enliven your classroom and engage your students on multiple levels.



Yamileht Garcia

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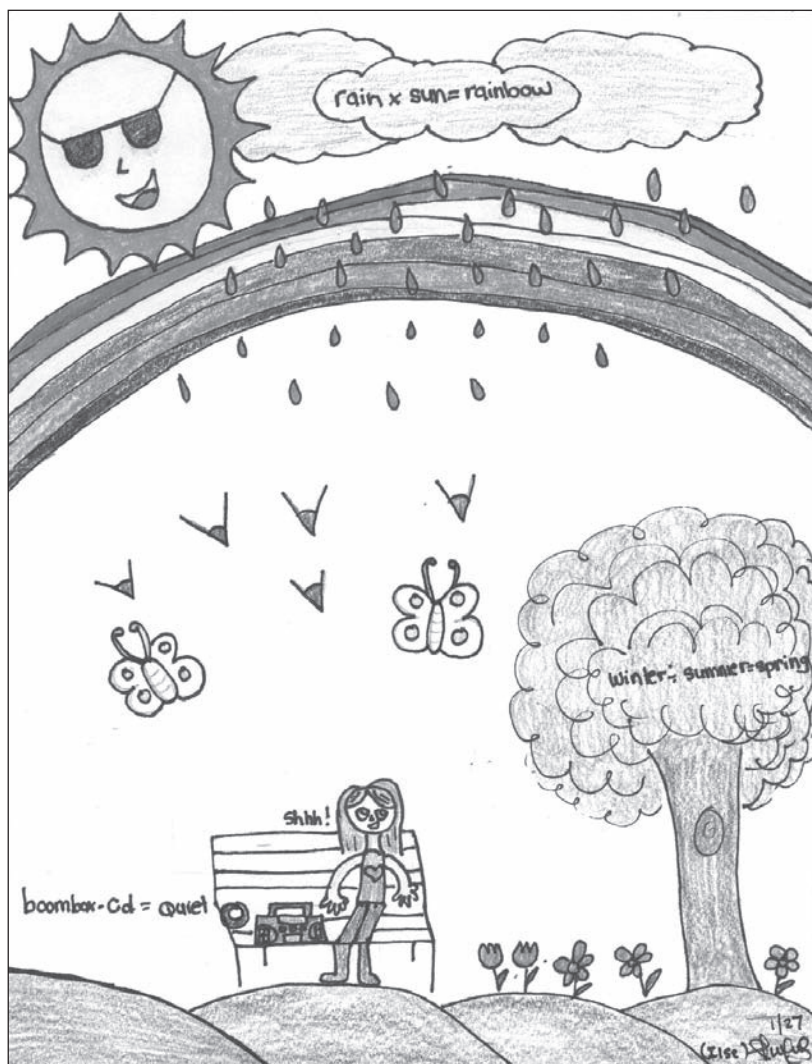
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*Ilse Nuñez*

# Introduction

Before it was common practice, my seventh-grade algebra teacher made a link between literature and math. After he introduced us to the math in Lewis Carroll's *Alice Through the Looking Glass*, I never looked back. In fact, I have been writing and publishing my own math poetry for decades. Because I wanted to share what I was discovering, I began introducing math poetry through workshops at elementary schools. In each classroom, mathematicians became poets, and poets became mathematicians. All children—mainstream, ELL, and verbally challenged—were able to participate. Teachers wrote their own poems and enriched the ideas I presented. A new writing form emerged that left us all invigorated.

By writing math poems, children discover aspects of math they've never imagined before. Working with math in a fresh way, they deepen their understanding of the operations and important math concepts. Particularly, they become more comfortable and adept with word problems, for they are essentially writing their own word problems. Importantly, writing math poetry shows children that math can be beautiful, funny, poetic, sassy, and creative. It also highlights important connections between math and other curriculum areas—science, social studies, and language arts—and connects math to students' lives.

This book is filled with Poetry Frames and ideas for helping children write their own math poems. Through these frames, math will come alive for your students, and poetry will gain a new dimension. The poetry is stunning, as you will see from both the samples and from your students' poems.

One of the most important aspects of math poetry is that there are no wrong answers. This open approach can help many children relax around math and around poetry. The children can break the rules, they can dive into their imaginations, they can explore numbers in a poetic way. As children and teachers use both sides of their brains at the same time, mathematics and poetry combine, resulting in a "chemical reaction" that opens children's minds in ways they haven't experienced before and we haven't seen before.

## How the Book Is Organized

This book is divided into two sections. Section I shows how to write “traditional” math poems. Section II describes how to teach what I call “mathematticles,” a fun and innovative type of math haiku.

Section I introduces frames for writing traditional math poems such as Ben’s poem about jellyfish shown below. This is a *diamanté* poem that has been adapted to include mathematics.

**100 jellyfish  
upside down, lighting, drifting  
50 are electric, 50 are flower-hatted  
calm, happy, mysterious  
100 stingers**

*Ben, grade 3*

This section introduces a variety of Poetry Frames, each focusing on a particular math concept. For example, children write poetic subtraction word problems, blues poems about money, free verse poems about estimating baby animals, division odes, and much more. You will immediately see how math has been interwoven into the poetry in a meaningful way.

In Section II, the chapters move on to a form of poetry called “mathematticles” in which words are substituted for numbers in math problems. These poems are very close to “math haiku.” They are based on a children’s picture book I wrote entitled *Mathematticles!* (Margaret K. McElderry Books, 2003) in which I explored the operations and many other math concepts.

Below are some poems similar to those in *Mathematticles!* This guide, *Math Poetry*, works perfectly without the picture book, but the book can be used as inspiration and to reinforce the learning.

**sprouting bulbs  
flight of wings  
+ warm rain  
signs of spring**

**birdhouse  
– birds  
seeddroppingshusks**

**veggies  
rows ) garden  
– produce  
weeds**

**woodpecker x rotten stump = birdworld rap**

**lake ÷ storm = ripples**

**fun x (mountains + ocean) = hiking + swimming**

Debbie Graham, an elementary school teacher who saw the mathematically children had written, said, “It’s so simple, it’s profound. By providing a simple structure and then allowing children to write about what’s in their heads and their hearts, they gain confidence, and anything can be built from that. Learning in poetry and math is about making connections, and that’s what this (writing mathematically) allows for.”

Mathematically are appropriate for mainstream, ELL, and gifted students. They can be an eye-opener for students who think they don’t “get” math or don’t like math. Thinking about math operations and concepts in words, rather than numbers, can turn on the light for students and help them think mathematically.

I’ve included a thorough explanation of how your students can use each Poetry Frame (template) to write their own math poems. For this purpose, every chapter in the book includes Sample Poems and a Poetry Frame, formatted as blacklines, to distribute to the students. The section entitled My Classroom Journal consists of a description of my experiences in the classroom to show how the lesson looked on a practical level and how students reacted. Sample poems written by children are interwoven throughout this portion and can be used as additional models. The Teacher Notes give step-by-step, explicit directions for teaching the Poetry Frame, including brainstorming exercises. In addition, I’ve included ways to adjust the difficulty of the lesson to make it easier or more challenging.

After Sections I and II, you will find a bibliography of math poetry books that can be used as poetry prompts and springboards for further math poetry writing.

## How to Use the Book

You are embarking on an intercurricular adventure that will yield wonderful results. Because math poetry is a new “genre,” I would suggest flipping through Sections I and II and getting the feel for math poetry. Once you’ve read through a chapter or two, you will see that you have the tools you need. I was a teacher myself, so I made your job easy.

The chapters of *Math Poetry* are arranged in a logical order mathematically; however, the book can be used in any order that suits your needs. You can pick and choose chapters according to the concepts you’re studying in math. Or, if you’re writing poetry with your students, you can interweave math poetry into your writing curriculum. You’ll find that your time is well spent because the poems will build both math and language arts skills. In addition, science and social studies play a role in the Poetry Frames. For example, there

are poems about predators and prey, about animals that come in groups of one hundred, and about animals who have thousands of babies. There are poems about the “fractions of me,” buying items at a store, and more. Throughout the book, the poetry prompts can be used to introduce, reinforce, and/or give a context to math concepts—to bring them to life, to personalize them, and to solidify them in children’s minds and hearts.

After choosing a chapter, read through the Sample Poem(s) and look at the Poetry Frame to see where the chapter is headed. Before the lesson, photocopy the Poetry Frame and possibly the Sample Poem(s). Or show the Sample Poem(s) on a transparency, a white board, or chart paper. Then read the Classroom Journal and the Teacher Notes to understand the lesson. Using the Teacher Notes, present the poetry prompt to the class. Add your own ideas to make it even richer.

Once the students are writing, circulate as you normally do to help children get started and to respond to the parts of their poems you delight in—the math, their knowledge of the math, the words, the use of language, the poetry, the ideas, the sense of humor, the cleverness, the personality that shines through. Note that students may want to work together on mathematickles, particularly for multiplication and division.

To validate the children’s poetry, make a book from the poems, either as individual books for each student or as a class book. You can also display poems in the classroom. Or you can have a poetry reading in the classroom. This can consist of informal sharing, or it can be a more organized reading, where poets are introduced. Above all, loosen your mind along with the children, and then hold onto your seat. You’re in for a fun, mind-opening, cross-curricular learning experience.

## Math Poetry and the Standards

Because the Standards are an integral part of today’s classroom, I included math and poetry concepts that are enumerated in the standards. Your time writing math poetry with your students will be well spent.

The math concepts covered are:

|                   |   |
|-------------------|---|
| place value ..... | Number Sense Poems, p. 18<br>Estimation Poems, p. 41    |
| geometry .....    | Shape Riddles, p. 23<br>Geometry Mathematickles, p. 112 |
| addition .....    | Addition Poems, p. 29<br>Addition Mathematickles, p. 87 |

|                      |   |
|----------------------|---|
| subtraction .....    | Subtraction Poems, p. 36  |
| measurement .....    | Measurement Poems, p. 56  |
| money .....          | Money Blues Poems, p. 49  |
| estimation .....     | Measurement Poems, p. 56<br>Estimation Poems, p. 41   |
| fractions .....      | Fraction Poems, p. 74<br>Fraction Mathematickles, p. 112  |
| multiplication ..... | Multiplication Poems, p. 62<br>Multiplication Mathematickles, p. 93<br>Multiplication Tables<br>Mathematickles, p. 97<br>Simple Division and Inverse Operations<br>Mathematickles, p. 102 |
| division .....       | Division Odes, p. 68<br>Simple Division and Inverse Operations<br>Mathematickles, p. 102<br>Long Division Mathematickles, p. 108  |
| graphing .....       | Graphing Mathematickles, p. 116   |
| algebra .....        | Algebra Mathematickles:<br>The Properties, p. 120<br>Algebra Mathematickles:<br>The Unknown, p. 127   |
| word problems .....  | Shape Riddles, p. 23<br>Addition Poems, p. 29<br>Subtraction Poems, p. 36<br>Multiplication Poems, p. 62<br>Division Odes, p. 68  |
| all concepts .....   | Free-form Math Poems, p. 80   |

Children will also learn many aspects of poetry writing and writing in general:

|                           |  |
|---------------------------|--|
| brainstorming .....       | all poems  |
| using references .....    | Number Sense Poems, p. 18<br>Shape Riddles, p. 23<br>Estimation Poems, p. 41                         |
| descriptive writing ..... | Number Sense Poems, p. 18<br>Shape Riddles, p. 23<br>Estimation Poems, p. 41<br>Division Odes, p. 68 |

|   |  |
|---|--|
| narrative writing .....                       | Estimation Poems, p. 41<br>Money Blues Poems, p. 49  |
| cause and effect .....                        | Subtraction Poems, p. 36<br>Money Blues Poems, p. 49   |
| point of view .....                           | Measurement Poems, p. 56   |
| fluency .....                                 | all poems  |
| poetry forms .....                            | discussion and examples, p. 10<br>Number Sense/ <i>Diamanté</i> Poems, p. 18<br>Shape Riddles, p. 23<br>Money Blues Poems, p. 49<br>Division Odes, p. 68<br>Addition, Subtraction, Estimation,<br>Money, Measurement, Multiplication,<br>and Fraction Poems in free verse, pp. 29,<br>36, 49, 56, 62, 74 |
| poetic language,<br>careful word choice ..... | all poems  |
| comparisons such as simile .....              | discussion and examples, p. 10<br>Shape Riddles, p. 23<br>Estimation Poems, p. 41<br>Money Blues Poems, p. 49<br>Division Odes, p. 68  |
| alliteration .....                            | discussion and examples, p. 12<br>all poems  |
| strong, vivid verbs .....                     | All poems, but particularly<br>Subtraction Poems, p. 36  |
| specific, sensory details .....               | discussion and examples, p. 13<br>All poems, but particularly<br>Shape Riddles, p. 23<br>Addition Poems, p. 29<br>Subtraction Poems, p. 36<br>Estimation Poems, p. 41<br>Division Odes, p. 68<br>Fraction Poems, p. 74   |
| line breaks .....                             | all traditional poems  |

## Math Poetry for All Students

Because math and poetry are universal languages, everyone in the class can participate successfully, regardless of their life experience, skill level, or language fluency.

One of the most inspiring moments of my poetry workshops came when Alexander, a third grader, showed me his poem about a mother turtle and her babies. It was so heartfelt that I assumed he was one of the enthusiastic writers in the class. He cleared that up quickly by explaining that he never liked to write, but he didn't mind writing the poem about the turtles. He was very proud of that poem, and his teacher said it was a defining moment for him in his attitude toward writing, which had not come easily to him before this. See Alexander's poem entitled "Baby Turtles" on page 46.

I found that ELL students were very enthusiastic about math poetry and wrote some charming poems. You can see it in Omar's addition poem. He wasn't sure about how to complete the last verse. When I asked him what *he* was doing as all these skunks were playing together, he said, "I'm hiding in the ground," and we laughed.

My topic is skunks.  
My numbers are  $87 + 64 = 141$

### 141 Skunks

87 skunks are in the dens.  
64 skunks are under the ground.  
One goes away  
and then there's 140.

They play tag together  
with their friends.

I am in the ground  
hiding.

*Omar, grade 2*

You can feel Maria's involvement in her subtraction poem. Maria is an ELL student from Russia:

7 little black flies  
were buzzing near a tree.

Along jumps a big fat  
hungry frog.

2 little black flies hurry away.

How many were left? 5 little black flies

*Maria, grade 2*