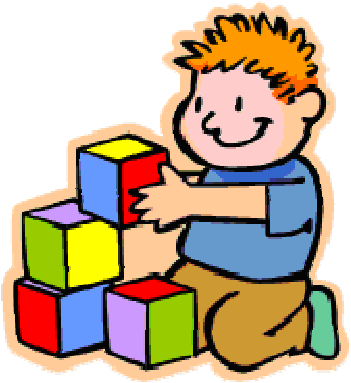
# Block Talk



Disseminator: **Raquel Diaz**
e-mail: raqueldiaz@dadeschools.net

**Sunset Park Elementary School**
School Code 5421
10235 SW 84 Street
Miami, Florida 33173

(305) 279-3222
Fax (305) 273-2130

For more information concerning Impact II opportunities,
Adapter and Disseminator grants, please contact:

The Education Fund
(305) 892-5099, Ext 18
e-mail: lvalle@educationfun.org
website: www.educationfund.org

# Blocks

by Sharon MacDonald

I'm building a house
Wide and tall.
I'm making a yard
With a garden and a wall.

I'm stacking the blocks
Big and small.
To make all the rooms
And a very long hall.

I'm putting the blocks
In as square all 'round,
In just the right places
So they won't fall down.

I have to build fast,
So there's time to play.
I'm all paced and ready
To move in today!

# TABLE OF CONTENTS

**GOALS & OBJECTIVES**
Project Goal 4
Sunshine State Standards 4
NCTM Standards 4

**OVERVIEW**
History of Blocks 5
Stages of Blocks 6

**THEORY BEHIND PROJECT**
Math Mediated Language 7
Vygotsky 7
Piaget 7
Lakoff 7

**WHY BLOCKS?**
General Reasons 8
Personal Interest 9
Action Research Study 10

**BLOCK TALK IN THE CLASSROOM**
Setting up Block Center 13
Purchasing Information 14
Asking for Parent Help 15
Parent Meeting Flyer 16
Teacher's Role during Block Talk 17
Everyday Math Words 18
Mathematical Vocabulary 19

**ADDITIONAL ACTIVITIES WITH BLOCKS** 20

**BIBLIOGRAPHY** 21

# GOALS AND OBJECTIVES

Block Talk is a project aimed at primary students from diverse backgrounds and varying levels of English proficiency. The aim of this project is to maximize students' use of everyday words to express mathematical concepts.

## SUNSHINE STATE STANDARDS

Through the child's independent play in the block center every math strand is being addressed: Number Sense, Measurement, Geometry, Algebraic Thinking and Data & Probability

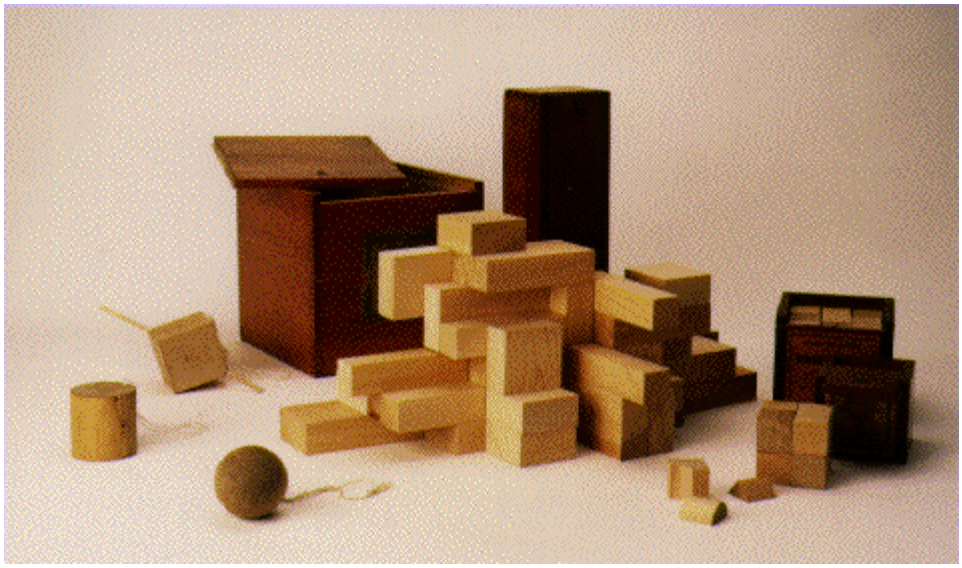
## NCTM STANDARDS

In 2000 the National Council of Teachers of Mathematics addressed for the first time preschool mathematics education in Principles and Standards for School Mathematics. NCTM standards are divided into content standards and process standards. As mentioned earlier, this project addresses all five content standards. The process standards include: problem-solving, connections, reasoning, representation, and communication. Block Talk integrates all the process standards into the content standards, but has a major focus on **communication**.

# HISTORY OF BLOCKS

Blocks are an integral part of most early childhood classrooms dating back to the 1880's. Block Play can be attributed to Froebel, the Father of Kindergarten (Wellhousen, 2001).

**Image of Froebel's Blocks of 1885**



# HISTORY OF BLOCKS

Most of the studies done on blocks were done by Harriet Johnson in the 1920's. Harriet Johnson was the director of The Nursery School, an experimental school for children ranging from 14-36 months, which is now referred to as the Bank Street School for children. Much of her research consisted on observing students at play, including playing with blocks. Harriet Johnson through extensive observation developed 7 stages of Block Play that are still used today.

**Stages of Block Play**

- Stage 1: Carrying
- Stage 2: Stacking
- Stage 3: Bridging
- Stage 4: Enclosures
- Stage 5: Patterns & Symmetry
- Stage 6: Early Representational
- Stage 7: Later Representational

# THEORY BEHIND PROJECT

**Math Mediated Language:**

Moseley & Bleiker (2003) introduced the concept of **Math Mediated Language** to explain how understanding math in the early years is related to linguistic development. They suggested that mathematical concepts begin as innate understandings that later become shaped and defined by the emergence of language. Everyday language becomes the carrier of early math concepts such as quantity, shape, and space. Prepositions, for example, in this conception are essentially spatial markers describing the topological properties of the world. Eventually everyday language gives way to more formal mathematical vocabulary, (i.e., prepositions such as around, over and under evolve into more formal geometric terms such as perimeter, circumference and coordinate plane).

*Math Mediated Language is grounded on the works of:*

**Vygotsky**

Lev Vygotsky is considered a social constructivist who believed learning occurred through the interaction of the child and "social others". He saw a strong role in social interactions and collaboration and is well known for several concepts: zone of proximal development, scaffolding (support), and the importance of language and thought.

**Piaget**

Piaget developed the Constructivist Theory of Mental Development. These stages include: Sensorimotor (from birth to 18 months), Preoperational (2-7 years), Concrete Operational (7-12 years) and Formal Operational. Piaget (1965) believed that through active manipulation and through the process of assimilation and accommodation, the child will acquire conservation, a necessary condition for all rational activity.

**Lakoff**

Lakoff is a linguist that began articulating exactly how language shapes meaning. His idea that all language is metaphorical with one thing standing for another, suggest that the everyday words of children can be used to construct specific mathematical concepts.

# WHY BLOCKS?

- Blocks are everywhere and easily accessible.
- Students love to construct and work with blocks.
- Block Play enhances cognitive skills: literacy, math, science, social studies.
- Block Play helps child develop social skills.
- Block Play encourages communication.
- Block Play allows a child to express himself/herself in a creative fashion.
- Block Play reinforces gross and fine-motor skills.
- Block Play has been proven to increase school achievement in mathematics. (Journal of Research in Childhood Education- March 22, 2001)

# WHY BLOCKS?

**Personal Interest**

No Child
LEFT BEHIND

With No Child Left Behind and the Put Reading First initiative, one can't help feel that math is being put on the backburner. If reading is first, does that make math second? As an early childhood educator, emergent literacy is crucial for a child's success, but equally important is math. Math is everywhere. From students standing in line (ordinal numbers) to buying lunch (counting money), students are continually thinking mathematically. Students use language to convey their mathematical thinking. Instead of seeing math and reading as separate subject areas, teachers need to see them as integrated and mediate the learning of each.

With 17 years of teaching experience, I have witnessed the pendulum away from back to basics to child-centered curriculum. As a veteran practitioner, I have been able to take from the pendulum what I consider to be the best of both worlds. Basic mathematical concepts are imperative to succeed in our society, but equally important is making learning meaningful. Child-centered activities advocate following the child's lead. I believe we need to find the opportunities to teach basic math skills while the child in naturally engaged. As a teacher, one of my favorite things to do is to observe my students while in play. Through these informal observations I try to be a fly in the wall and just listen and appreciate all I learn from my students. I love to hear their dialogue and watch them interact with each other. During my informal observations, I have noticed that students weren't just playing they were developing social and cognitive skills.

# WHY BLOCKS?

## Action Research

**Purpose of Study**: To observe if students were using everyday words to express mathematical concepts.

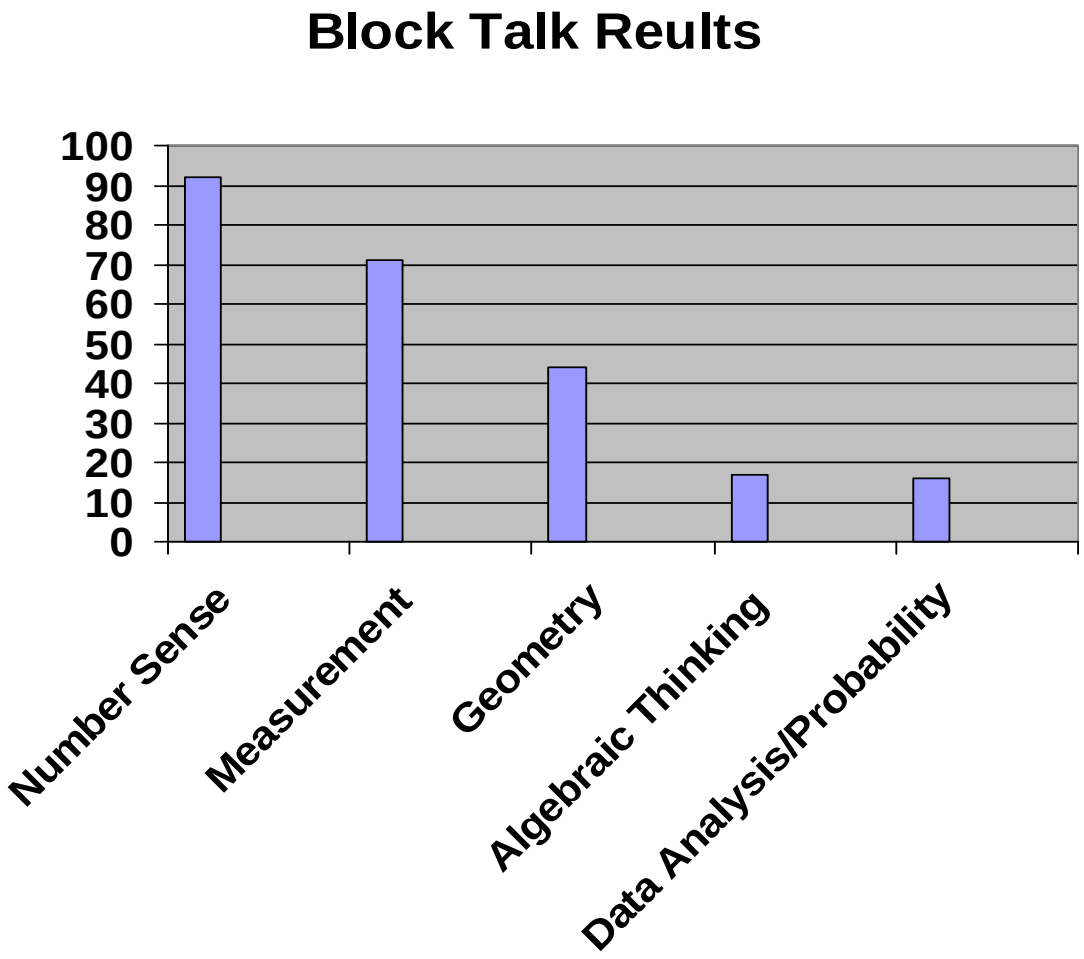
**Sample Size**: Twelve students were observed in the morning playing independently in the block center.

**Data Collection**: Students were observed for 30 minutes on five separate mornings. Students ranged in age from three to five years old. The researcher observed the students and took fieldnotes about the dialogue she heard. The notes were then coded into the five NCTM Content strands: Number Sense, Measurement, Geometry, Algebraic Thinking and Data Analysis and Probability.

**Results:**
A total of 240 utterances were coded during the 2 ½ hours of field notes. Student dialogue was robust with mathematical understanding.

**Results** (continued)

- Number Sense: 92 utterances
- Measurement: 71 utterances
- Geometry: 44 utterances
- Algebraic Thinking 17 utterances
- Data Analysis and Probability: 16 Utterances.



## Implications of Action Research

- Students are engaged in rich mathematical thinking during block play.
- Future studies need to analyze mathematical discourse in other school activities.
- Teachers are crucial in scaffolding mathematical learning and need to become aware of these opportunities that are occurring throughout the school day.

# BLOCK TALK IN THE CLASSROOM

Setting up Block Center (Things to consider)

- *Where is the block center going to be in my classroom*? It will be a noisy area and an area that requires space. Find a place where there is little traffic and not near the reading center or your guiding reading table.

- *What kind of blocks do I need to buy?* There are so many different kind of blocks. For my grant, I wanted to use the unit blocks (the one Froebel created and have past the test of time). I also purchased Lincoln Logs (they bring great childhood memories). I already had connecting cubes and connecting triangles. The market has many different kinds of blocks. There are also foam blocks, cardboard blocks, Lego blocks, Duplo blocks,… See next page for listing of where to purchase blocks.

- *How many blocks will I need?* The way I tackled this was economically. How many blocks can I buy with the funds I had? Based on the number of blocks I purchased, I restricted the center to the number of kids who could work with the amount of blocks without feeling limited. This management technique also avoids disputes in the block center.

- *Where am I going to store the blocks?* My original grant had allocated for a shelf, but the shipping and handling was going to be quite expensive. My plan was to either save cost by going to a local store or hunting for a shelf in the school. I was quite fortunate to find a large shelf that was in a storage room and was able to use the shelf money to purchase more resources to supplement my project.

- *When will the students use the blocks?* During my morning Language Arts block, students were encouraged to go to "Morning Centers", but during the afternoon Math block students were allowed to go to the "Math Centers" which included the block area. I prefer afternoon, because it is a time when the students are becoming restless and need the sensory stimulation and the change of environment.

*Purchasing Information*
*Where do I purchase blocks for my project?*

Although there are many places to go for blocks, I purchased my materials for Block Talk through the following companies.

1. **School Specialty® Contact Information**

**Phone Number**
1-888-388-3224
920-882-5994 (International)
**Fax Number**
1-888-388-6344
920-882-4594 (International)
**Email Address:** info@schoolspecialty.com
**Web Site:** http://www.schoolspecialty.com
**Mailing Addresses**
School Specialty
PO Box 1579
Appleton, WI 54914-1579
School Specialty
PO Box 8105
Mansfield, OH 44901-8105

* School Specialty collaborates with Child Craft and other educational companies. Through my experience they provide the most extensive catalogue for one-stop shopping.

2. Many of my books were purchased through www.amazon.com

Asking for Parent Help

- Have a Parent Night to kick off your project. Blocks in a second grade classroom may be the source of smirks and judgments if the observer is not clear on the purpose of the blocks. I made it a point to have an informational meeting with the parents to inform them about Block Talk and how they can help. During the meeting it was evident that parents not only are a team, but a great resource. See attached flyer on next page.

- Ask for donations of blocks or accessories for your block center. The triangle blocks I have were donated by a parent. As you see students engaged in the block center, you will see how they could benefit from accessories such as cars, little people, plastic trees, dollhouse accessories, plastic animals, pipe cleaners, and the like.

- Encourage parents to foster the child's mathematical vocabulary as they play at home.

# Block Party

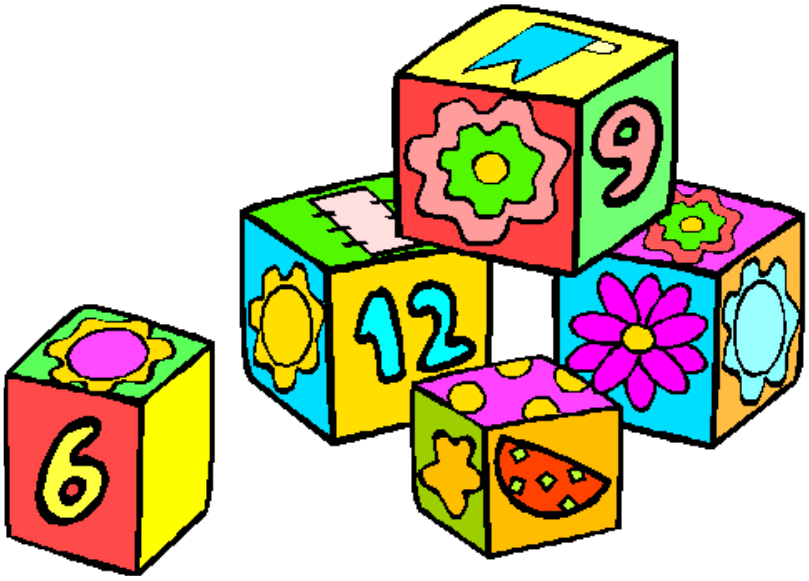
# at Mrs. Diaz's Classroom

You are invited to our first annual Block Party!

Mark your calendars and plan to attend to discuss an exciting new project that will truly enhance your child's math and reading potential.

**Where**: LCD (my classroom)
**When**: Wednesday, November 16th
7:30 PM -8:30 PM

See you there! ☺



Teacher's Role during Block Talk

- Now that you have your block center ready, the first step is to model how to use and take care of the blocks. Have as one of our weekly jobs two or three kids in charge of the block center. They don't necessarily have to clean up after others play, but they make sure the center is taken care of by those who have used it that day.

- With Block Talk the most important ingredient is for you to become an active observer in the block center. At first I just observed without making any comments (like a fly in a wall). Then I made it a point to hear the child's everyday words and bridge them to the mathematical concept they were referring to. For example, if a child said to another, "I have more." I would take the opportunity to discuss number operations, one-to-one correspondence and find the difference in quantity. (Refer to list of everyday math words children use and to mathematical vocabulary pages.)

SAMPLE OF EVERYDAY WORDS THAT COULD BE BRIDGED TO MATHEMATICAL CONCEPTS

- One
- Two
- Three
- Four
- Five
- More
- Less
- Big
- Bigger
- Biggest
- Small
- Smaller
- Smallest
- Do it this way
- I have more
- You have less
- In
- Out
- Over
- Under
- Above
- Below
- Top
- Middle
- Bottom
- All
- None
- First
- Last
- Circle
- Square
- Same
- Different
- Less
- A lot
- Little
- Large
- Beside
- Nothing
- Everything
- Heavy
- Light
- Front
- Inside
- Outside
- Back
- Close
- Open
- Tall
- Not like that
- Same

MATHEMATICAL VOCABULARY

- Sum
- Addend
- Difference
- Probability
- Algebraic pattern
- Area
- Closed figures
- Length
- Line
- Nonstandard unit of measurement
- Number sentence
- Operation
- Perimeter
- Side
- Whole numbers
- Congruent
- Flip
- Slide
- Reflection
- Transformation
- Rotation
- Symmetry
- Weight
- Capacity
- Area
- Estimation
- Mean
- Median
- Mode
- Place value
- Right angle
- Volume
- Fraction

# ADDITIONAL ACTIVITIES

TO DO WITH BLOCKS

*** Note: This project's goal is to observe students during independent block play in order to bridge their everyday words to the mathematical concept they are expressing, but you may want to use your blocks for some of the following activities**.

- Use blocks to measure things. Unit blocks are great for this activity.
- Use blocks to balance objects on a scale.
- Use blocks to create patterns.
- Use blocks to construct buildings, bridges, cities, and the like.
- Use blocks to create sets for retelling stories.
- Use block design to show symmetry or have students make a block design congruent to one shown.
- To demonstrate simple machines (pull, lever, fulcrum, and the like)
- To reinforce mapping skills and the compass rose.

**Once you have blocks in your room, the possibilities are endless.**

# BIBLIOGRAPHY


Clements, D. H. & Sarama, J. (2004). *Engaging young children in mathematics: Standards for Early Childhood Mathematics Education.* Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Copley, J. (2000). *The young child and mathematics.* Washington DC: NAEYC.

Hirsch, E. (1993). *The Block Book.* Washington DC: NAEYC.

Johnson, H. (1928). *Children in the nursery school.* NY: Agathon Press Inc.

Lakoff, G. & Johnson, M. (1980). *Metaphors we live by.* Chicago: The University of Chicago Press

Lakoff, G. & Nunez, R. E. (2000). *Where mathematics comes form: How the embodied mind brings mathematics into being.* New York: Basic Books

MacDonald, S. (2001). *Block play: The complete guide to learning and playing with blocks.* Beltsville, MD: Gryphon House.

Moseley, B. & Bleiker,C. (2003). *Pre-service early childhood teacher's representations of quantity relations: The role of math mediated language.* Paper presented at the PME meeting, Oahu, HI.

National Council of Teachers of Mathematics (1991). *Professional standards for teaching mathematics.* Reston, VA: Author.

Piaget, J. (1965). *The child's conception of number.* NY: WW Norton & Company.

Vygotsky, L. (1962). *Thought and language.* Cambridge, MA: MIT Press.

Wellhousen, K. & Kieff, J. (2001). *A constructivist approach to block play in early childhood.* Albany, NY: Delmar Thomson Learning.

Wolfgang, C. H. (2001). Block play performance among preschoolers as a predictor of later school achievement in mathematics. *Journal of Research in Childhood Education, 15 (2)*, 173-178.