Numeracy and Literacy: Teaching Mathematics Using Children's Literature

Dr. Robin A. Ward Associate Director for Curriculum Integration Rice University School Mathematics Project <u>raward@rice.edu</u>

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# http://www.peakparent.org (If link does not take you, click on Product Catalog ==> Books)



#### www.amazon.com

#### (If link does not take you, search on: Robin Ward mathematics)



How Much Is a Million (Schwartz, 1993)

#### Mathematical Strand: Number Sense and Operations Grade Band: 3-5



## Students put 1 million into perspective.



- Time to eat one million twinkies, PB&J sandwiches; to do 10<sup>6</sup> jumping jacks; to sing *Row Row Row Your Boat*
- Length of one million: pencils, crayons, stacked soda cans, spaghetti noodles, etc.
- *Weight* of one million pennies, elephants, m&m's, etc.

## Literature in the Mathematics Classroom

- Picture books
- Fiction
- Non-fiction
- Biographies
- Poetry

# If the World Were a Village (Smith, 2002)

#### Mathematical Strand: Data Analysis and Probability Grade Band: 6-Algebra 2



# If the world were a village...

- World's population: 6,200,000,000
- Consider a village of 100 people
- Each 1 person in the global village represents ...
   62 million people (100 X 62,000,000 = 6,200,000,000)

Students discuss and make predictions about aspects of the global village using pie charts.

• Languages, religions

• Access to food, water, clean air, electricity

• Distribution of wealth, ages

• Schooling, literacy

Additional Applications of If the World Were a Village

- Explore exponential functions
- Population growth
- Number sense
- Scientific notation

*I Spy Shapes in Art* (Micklethwait, 2004) Mathematical Strand: Geometry Grade Band: PreK-2



# Students embark on a shape hunt and record their findings.





### The Dot (Reynolds, 2003) Roy Lichtenstein (Getting to Know the World's Greatest Artists Series) (Venezia, 2002)

#### Mathematical Strand: Number Sense and Operations Grade Band: PreK-2





# Students view Benday dots; use Do-A-Dot paints to create Lichtenstein art; estimate and count their dots.





DOTS	I think I see	I counted
PINK		
PURPLE		
yellow		
GREEN		
RED		
BLUE		
ORANGE		

A Million Dots (Clements, 2006) George Seurat (Getting to Know the World's Greatest Artists Series) (Venezia, 2003)

#### Mathematical Strand: Number Sense and Operations Grade Band: 3-5





# Are there a million dots in Seurat's A Sunday Afternoon...?



- Painting measures ~ 6'8" x 10'
- Each dot measures ~ 1/16" across

The Essential Calder (Greenfield, 2003) Alexander Calder (The Life and Works of...Series) (Schaefer, 2003)

#### Mathematical Strand: Patterns, Algebra, & Functions Grade Band: 6 - Algebra 1





## The mathematics behind Calder's mobiles: *The Law of Levers*



# $W_L X D_L = W_R X D_R$

## Students discover the Law of Levers.



Pennies on	Distance	Pennies on	Distance	
left side of	from pennies	right side of	from pennies	
lever	on left to the	lever	on right to the	
$(P_L)$	pivot point	$(P_R)$	pivot point	
	$(D_L)$		(D <sub>R</sub> )	
		0		

## Students test and apply the Law of Levers.







### An Optical Artist (Roza, 2005) Reflections (Jonas, 1987)

#### Mathematical Strand: Patterns, Algebra, & Functions Grade Band: 6 - HS Geometry





Students create Escher-like tessellations by performing transformations and then find real-life examples of tessellations.





## **Explore Mathematics Using Biographies**



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## Marie Curie (History Maker Bios Series) (Waxman, 2003)

#### Mathematical Strand: Patterns, Algebra, & Functions Grade Band: 9-Algebra 2



# A Game of Functions (Froman, 1974)

#### Mathematical Strand: Patterns, Algebra, & Functions Grade Band: 5-8



# What is graphed?



## Prehistoric Actual Size (Jenkins, 2005)

#### Mathematical Strand: Measurement Grade Band: 5-6



Students measure/compute height-to-length ratios of plastic dinosaurs, compare to actual statistics, and discuss scale accuracy.



- Measured height: 4.75 in.
- Measured length: 2 in.
- Scale factor: 2.375
- Actual height: 28 feet
- Actual length: 14 feet
- Scale factor: 2

## How the Stars Fell into the Sky (Oughton, 1996) Zoo in the Sky (Mitton, 1998)

#### Mathematical Strand: Geometry and Measurement Grade Band: K-4





# Students highlight polygons and/or angles and then create their own night sky.





# **Teaching Math Using Poetry**

# Second graders make a sketch of Shel Silverstein's poem and compare/contrast illustrations.



#### SHAPES

A square was sitting quietly Outside his rectangular shack When a triangle came down—kerplunk!— And struck him in the back. "I must go to the hospital," Cried the wounded square, So a passing rolling circle Picked him up and took him there.

# A Pizza the Size of the Sun (Prelutsky, 1996)

#### Mathematical Strand: Geometry and Measurement Grade Band: 6-8



# Questions to explore...

- A medium pepperoni pizza from Dominos measures 12 inches and contains 36 slices of pepperoni. How many slices of pepperoni would fit on a pizza the size of the sun?
  - What does "12 inches" mean?
  - How big is the sun?
  - Circumference or area formula?
  - But the sun is a sphere...

## Robin A. Ward, PhD

raward@rice.edu