

## NUMBER & OPERATIONS (Strand A)

### Representations of Numbers (Standards 1)

1. Dr. Seuss. *The 500 Hats of Bartholomew Cubbins*. New York: Random House, 1938.

A little boy tries to take the hat off his head in respect to the king. But each time a hat comes off, another hat appears on his head. Many attempts are made to remove the hats. The 500th hat is exceedingly beautiful and is sold to the king.

- Have students think about different ways to write a number such as 500. What would be some different ways that Cubbins could take the hats off his head? How many would he have left each time?

2. Ga'g, Wanda. *Millions of Cats*. New York: Coward-McCann, Inc., 1928.

A man goes on a journey to find a cat for his wife. He ends up with a million cats. In trying to decide which is the prettiest, the cats fight among themselves until only one cat is left.

- Have students attempt to determine the amount of space occupied by a million cats. How much water would they need each day? How much food? If necessary, adjust the total number of cats to a number more appropriate for the students in your class.

3. Kotzwinkle, William. *The Million-Dollar Bear*. New York: Alfred A. Knopf, 1995.

The original teddy bear is unhappy because he is so valuable that he is kept in a vault. He manages to escape and then the adventure begins.

- Have students investigate the costs of some famous items, such as paintings, dolls, costumes, etc. The data collected can be used to compute statistics such as mean, median, or mode. If students collect coins or dolls or some other object, have them investigate some of the most expensive items of that type held by collectors.

4. Mathews, Louise. *Gator Pie*. Littleton, MA: Sundance Publishing, 1979.

Two gators find ways to cut a pie.

- Have students take a rectangle or a square and draw as many different representations of a particular fraction as possible.

5. McMillan, Bruce. *Eating Fractions*. New York: Scholastic, Inc., 1991.

Pictures contain food cut into various fractional parts.

- Have students represent fractions in the real world.

6. Nolan, Helen. *How Much, How Many, How Far, How Heavy, How Long, How Tall Is 1000?* Toronto: Kids Can Press, 1995.

Kids investigate aspects of 1000 of some object.

- Have students collect 100 or 1000 of various objects. Before they start, have them estimate the amount of space that 100 or 1000 of this object will occupy. Compare estimates with actual measures.

7. Schwartz, David M. *How Much Is a Million?* New York: Mulberry Paperback Book, 1985.

Images of a million, a billion, and a trillion are provided by determining how long a line of a million, a billion, or a trillion kids would be if stacked on top of each other. Other comparisons are also made to provide some sense of the sizes of these numbers.

- Have students check the estimates provided in the book.

8. Schwartz, David M. *If You Made a Million*. New York: Lothrop, Lee & Shepard Books, 1989.

This book explores how one might spend a million dollars.

- Have students attempt to spend a million dollars, recording their purchases.

9. Scieszka, Jon and Lane Smith. *Math Curse*. New York: Viking, 1995.

A young girl sees everything as a math problem to be solved.

- Have students solve the problems in the book and then make their own book of similar problems.

10. Sharmat, Marjorie Weinman. *The 329th Friend*. New York: Four Winds Press, 1979.

Emery, a raccoon, thinks he is boring so he invites 328 friends over for lunch. When it seems as though everyone is ignoring him, he decides to eat with himself and discovers that he's not so bad after all.

- Have students record data about eating habits in the school cafeteria. How many students sit together? In what size groups? What foods are eaten most often? Which school lunch meals are popular? What types of drinks are purchased most frequently? Display the data in an appropriate fashion.

### **Number Systems (Standard 2)**

11. Schmandt-Besserat, Denise. *The History of Counting*. New York: Morrow Junior Books, 1999.

A brief history of several numeration systems is described and illustrated.

- Have students research other numeration systems and/or write numbers in our customary system as well as in one of the numeration systems from the book.

### **Operations with Numbers (Standards 3 and 4)**

12. Adler, David A. *fraction fun*. New York: Holiday House, 1996.

Aspects of fractions are introduced in a lively fashion with many diagrams and real-world contexts.

- Have students make up their own fraction problems for other students in the class to solve.

13. Anno, Masaichiro and Mitsumasa Anno. *Anno's Mysterious Multiplying Jar*. New York: Philomel Books, 1983.

A jar contains an island on which are two countries. Each country contains three mountains. The patterns continue until there are 10! jars.

- Have students design a similar book using a context of their own choosing.

14. Axelrod, Amy. *Pigs in the Pantry: Fun with Math and Cooking*. New York: Simon & Schuster, 1997.

When mom gets sick, the pigs try to make her favorite recipe.

- Have students consider some of their favorite recipes. Determine how the amount of the ingredients would need to change to make enough of the dish for the entire class? For the entire school?

15. Axelrod, Amy. *Pigs go to Market: Halloween Fun with Math and Shopping*. New York: Simon & Schuster, 1997.

When the pigs go the grocery store, they win a shopping spree.

- Give students copies of food ads from the newspaper. In a given period of time, how much they can spend, being sure to maintain a balanced food pantry?

16. Axelrod, Amy. *Pigs Will Be Pigs*. New York: Simon & Schuster Books, 1994.

Before the pigs can go to dinner, they must search the house for money.

- Bring in menus from local restaurants. Have students try to take their whole family to dinner on the amount of money the pigs had to spend.

17. Giganti, Paul, Jr. *Each Orange Had 8 Slices*. New York: Greenwillow Books, 1992.

Each page of this book contains several problems, with multiplication as the focus.

- Extend the ideas represented on each page to have students look for patterns. Have students create their own problems similar to those in the book and use those at a learning center for other students to solve.

18. Hulme, Joy N. *Counting by Kangaroos: A Multiplication Concept Book*. New York: W. H. Freeman and Company, 1995.

Australian animals are used in this multiplication book.

- Students can create their own multiplication counting book of problems using a class-determined theme.

19. Hulme, Joy N. *Sea Squares*. New York: Hyperion Books, 1991.

This counting book uses an ocean theme as it explores multiplication patterns of the form  $n \times n$ , from  $1 \times 1$  to  $10 \times 10$ .

- Have students create their own book in the same style but using a context of their choice.

20. Hutchins, Pat. *The Doorbell Rang*. New York: Mulberry Books, 1986.

A plate of cookies is divided among several children. The number of children changes each time the doorbell rings.

- Build a table of values of the number of children and the number of cookies each receives. Graph the data and then attempt to write a rule to describe the pattern.

21. McKissack, Patricia C. *A Million Fish ... More or Less*. New York: Alfred A. Knopf, 1992.

A boy catches fish in the Louisiana bayou.

- Solve the various problems presented in the book. Have students construct their own problems that would help them get rid of a million fish.

22. Merrill, Jean. *The Toothpaste Millionaire*. Boston: Houghton Mifflin Company, 1972.

A young boy decides that toothpaste is too expensive and he believes that he can make it cheaper. He sets out to develop a formula for toothpaste and market his creation.

- Have students create a class business or store and keep track of expenses and income.

23. Murphy, Stuart J. *Divide and Ride*. New York: HarperCollins Publishers, 1997.

Division problems are set in the context of an amusement park.

- Have the class decide on a context and then construct a series of division problems. Students should solve the problems created by their peers.

24. Murphy, Stuart J. *Give Me Half!* New York: HarperCollins Publishers, 1996.

A brother and sister must share all their food.

- Have students consider different ways that one whole can be shared among 2, 3, or 4 children. Children may have different fractions of the whole. Write number sentences to show how the whole is shared.

## **Number Theory (Standard 5)**

25. Christaldi, Kathryn. *Even Steven and Odd Todd*. New York: Scholastic, 1996.

Steven only likes even things and Todd only likes odd things.

- Have students generate numbers and classify them as even or odd, providing an illustration to justify their classification.

26. Dee, Ruby. *Two Ways to Count to Ten*. New York: Henry Holt and Company, 1988.

The leopard king is seeking a husband for his daughter. The animal who is able to toss a spear into the air and count to ten before it hits the ground wins. This tale indicates that sometimes the cleverest is the winner.

- Have students consider the different ways to count to given numbers. Use the results to make connections to ideas of factors, prime numbers, and composite numbers.

27. Pinczes, Elinor J. *One Hundred Hungry Ants*. Boston: Houghton Mifflin, 1993.

One hundred ants are marching to a picnic. They arrange themselves into rows of different sizes in order to get to the picnic faster.

- Make a table that shows the number of rows and the number of ants in a row. Graph the results. Try to write a rule to describe the pattern in the table.

28. Pinczes, Elinor J. *A Remainder of One*. Boston: Houghton Mifflin, 1995.

Twenty-five ants arrange themselves into columns of different sizes, each time leaving a remainder of one. The pattern continues until there is no remainder.

- Create number puzzles similar to those in the book for students to solve.

## **Miscellaneous**

29. Time-Life for Children. *Alice in Numberland: Fantasy Math*. Alexandria, VA: Time-Life for Children, 1993.

Alice explores all kinds of numbers, including fractions, counting, and place value. She also explores geometry and measurement.