Providing a Context for Learning Mathematics
Through Children’s Literature

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Children’s literature can promote a great deal of student interest in the learning of mathematics. The reason for this is that literature can provide a real-life or imaginary context for learning mathematics. For example, when introducing the concept of division as a partitive or sharing model, the teacher may choose to share the book *The Doorbell Rang* (1986) by P. Hutchins. In this book Ma has made a dozen cookies for Victoria and Sam to share. Each time the doorbell rings, more friends are welcomed in to share the cookies. More and more children mean fewer and fewer cookies to go around. As the teacher reads the book, a set of cookies (or counters) could be placed on a different number of plates. At the end of each round of doorbell rings, the teacher could write a numerical sentence to show the division fact. Once the book has been read, students could go back and create their own picture book with the different division facts.

Not only can children’s literature be used to introduce a mathematical concept, it can be used to reinforce mathematical concepts. That is, if a class has been studying coins and how to make change, the teacher may wish to share Holtzman’s book *A Quarter from the Tooth Fairy* (1995). In this book a young boy receives a quarter from the tooth fairy and spends the day buying various objects and returning them, until he finally decides what he really wants is to buy his tooth back. This story provides an opportunity for the students in the class to determine the different ways one can make change for a dollar. This problem-solving activity helps to reinforce the value of various coins and how these coins can be used to make change for a fixed value, 25¢.

Finally, children’s literature can provide a springboard for reviewing mathematics already taught. For instance, if students have been working on place value up to the 1000’s place, Stuart Murphy’s book *Earth Day – Hooray* (2004) would be a good book to read. In this story, a drive to recycle cans on Earth Day teaches the children of the Maple Street School Save-A-Planet Club about place value. As the teacher reads this book, he or she could have the students anticipate how the children in the book can arrange their cans into certain group sizes to keep track of the number of cans they have collected and how many more are needed to reach their goal.

A few classic books have been used to illustrate how children’s literature can be used to introduce, reinforce or review mathematical concepts. What follows is an annotated bibliography of children’s books that classroom teachers can use to teach mathematics. The authors found the majority of these books in Emporia State University’s Science and Mathematics Education Center’s wonderful literature collection. Many of these books were written to be used in the teaching of mathematics, while others are simply good pieces of children’s literature that can be used in a mathematics classroom to introduce, reinforce, or review mathematical concepts. Many books could be used with several different mathematical concepts, we have included them only under one heading. As you look through these books, we hope that you will be motivated to use them and the activities in your own classroom.

K-5 Annotated Bibliography

Before the fun begins you must know that letters used in the synopsis indicate grade level: P = Primary (K-2), I = Intermediate (3-5), and A = All (K-5).
Problem Solving

  
  **Synopsis**: In this book, children look for math they encounter throughout their day, such as when getting ready for school, in various school subjects, and at home. (P)
  
  **Activities**: Have children discuss where they encounter math in their daily routines. Create a class book that illustrates math in their lives. Once math has been identified in a particular event, create story problems to be solved.

  
  **Synopsis**: What has zero feet, 3 tails and lives in a bowl? Three fish. This is a book that creatively combines math with riddles. It makes the reader enjoy math while trying to solve riddles. (P)
  
  **Activities**: Create some riddles that would allow children to count by 2's, 3's, and 4's to solve. Provide counters to assist students in "acting out" the riddles. Have students write their own riddles and share with the class.

  
  **Synopsis**: Examine the life of Ben Franklin through the colorful drawings and interesting tales. Learn why Ben Franklin may have been intrigued with magic squares. (A)
  
  **Activities**: Have students find as many different 3x3 magic squares as possible for the numbers 1-9, 4x4 using the numbers 1-16, and as many 3x3 magic squares using the numbers 1,3,5,7,9,11,13,15,17.

  
  **Synopsis**: The children in the story must solve mysterious mathematical clues to find a surprise treasure left by a friend. (A)
  
  **Activities**: Have children create and solve simple codes. Allow groups of children to create their own cities and treasure hunt. Have the students create a clue map to guide others to a school landmark, such as the flagpole, principal's office, etc.

  
  **Synopsis**: The young female narrator has serious math anxiety. "I don't even bother to take out the cereal, I don't want to know how many flakes are in a bowl," she laments. "Everything I look at or think of has become a math problem." This witty wordplay, zany typography, and fast-paced story shows how this math curse can be broken. (I)
  
  **Activities**: Have students create their own pages of "problems" they encounter in their own day-to-day activities. Have students solve the problems posed in the book and create extension problems for the class.

  
  **Synopsis**: Timothy and his friends investigate counting, adding, money, patterns, graphs, multiplication, and fractions in times that involve interesting problems for he and his friends. This book can be used to explore problem-solving ideas for early primary students and a review for older students. (P)
  
  **Activity**: Have the students solve many of the questions in the book before reading it. Then, discuss if they solved the problems like Timothy and his friends.

Number

Comparison

  
  **Synopsis**: Momma, Papa, and Baby Bear each have their own portion of porridge, but with the addition of Goldilocks adjustments must be made. (P)
Synopsis: This story shows children comparing objects using comparison words. (P)

Synopsis: At a school picnic, Eddie uses his knowledge of numbers to outsmart the people who come to his game booth. (P)

Synopsis: As Birdie and his friends try to locate a house that is just right for his size, readers learn about the concept of capacity. (P)

Synopsis: While performing an energetic gymnastic routine, Zoe demonstrates such spatial opposites as on and off, inside and outside, and over and under. (P)

Synopsis: While a bunny and his mother shop in a grocery store for lunch guests, the reader may count and compare the amounts of carrots, peanuts, and worms in the grocery carts of other shoppers. (P)

Synopsis: Initially unhappy that a summer growth spurt has made her the tallest third grader at school, Tina soon realizes the advantages of being able to jump, reach, and step farther than her peers. (P)

**Counting**

Synopsis: Two children search their apartment building from the first floor to the tenth but their pet rabbit stays one hop ahead of them. (P)

Synopsis: Unable to play hide-and-seek because he cannot count, Frog goes for a ride on his bicycle and makes a discovery, he can count to ten. (P)

Synopsis: A beautifully illustrated counting book follows a gorilla through jungles, gardens and forests, with hidden animals waiting to be counted. (P)
Activities: Have students predict how many animals are in the book. Give them counters and crayons and challenge them to find out the total number of animals. Make a class book using different characters but following a similar pattern.

Synopsis: Count the number of monsters (10) that are hungry for food and won't leave the house until they are fed. (P)

Synopsis: Simple text and photographs explore some words for numbers and number-related concepts and present puzzles to be solved. This book provides a pictorial meaning of mathematical language such as uni-, pair, couple, bi-, tri-, several, odd, even, some, a half-dozen, a dozen. (P)
Activities: Students make up new words using prefixes found in the book. Students use art to create their own pictures for the book or for their new words.
Synopsis: In each pair of facing pages a new counting problem is presented in the form of a poem. Closely examine the pictures to determine a quick way to count the objects. Answers are provided at the end of the book. (I)

Synopsis: Ten field mice find themselves in a predicament - They are about to become the next meal of a very hungry snake. Fortunately for them, the snake is also a very greedy snake. (P)
Activities: Ask the students to cut mice out and attach them onto a counter strip. See who is first to put the tenth mouse on the strip by placing one or two mice on the strip while taking turns. Have students find all possible solutions for the ten mice to be placed inside or outside of the jar.

**Place Value**

Synopsis: For a chance to win a trip to Space Camp, James sets out to collect 10,000 Blast Off Energy Bar wrappers, grouping them in thousands, hundreds, tens, and ones as he goes to make counting easier, and soon the whole town is helping him out. (P)

Synopsis: Text and illustrations of the familiar O-shaped cereal help the reader count to ten and count by tens. (P)

Synopsis: The children learn 100 spelling words, plant 100 seeds, bake 100 cookies, and "do everything the 100 way" to celebrate this special day. (P)

Synopsis: A drive to recycle cans on Earth Day teaches the children of the Maple Street School Save-A-Planet Club about place value. (I)
Activities: You can have the students make up problem or investigations using recycling facts. For example, collect used water bottles, etc. from schoolmates and determine how many are thrown away weekly on average.

Synopsis: This book explores the meaning of 1000. A nice feature of this book is how it shows the size of 1000 relative to object being discussed. For example, while a thousand freckles on a person’s face seem like a lot, 1000 hairs on one’s head would not be very much. (P)

Synopsis: Building on an understanding of the base-ten system, ten digits are used to progress through place value to a million. (I)

Synopsis: Basic mathematical operations (counting, skip counting, addition, subtraction, multiplication, and division) are used to demonstrate different ways of arriving at 100 items. (A)

Synopsis: This book is about a young girl who gets a birthday party invitation. On the day that she is to go to the party, she realizes that her hamster, Spotty, has chewed several holes in the invitation leaving many possible street addresses for the party. Along with her friends, Pauline reaches her destination. (A)
Activities: Work together in groups to solve the problem in the story. Have students create their own mystery problems.
**Negative Numbers**

Synopsis: Perry, a penguin, finds, loses, earns, and borrows clams in order to achieve the nine he needs to buy an ice scooter. In this story Perry often owes his friends more clams than he owns. As a result, his graph must have negative numbers. (I)

**Estimation**

Synopsis: A boy and his dog demonstrate number sense by presenting amusing counting, size estimation, and mathematical facts. (I)

Synopsis: This book uses a dialog between two friends, one who estimates and one who counts precisely, to show estimation at work in everyday life. (I)

Synopsis: A pack of coyotes tries to determine how many roadrunners and other creatures are in their vicinity. While some count different groups and add their totals together, Clever Coyote rounds off and estimates.

**Computation**

Synopsis: Harley Harrison, the biggest tattle-tale and best math student in second grade, meets his match in both areas when Emma Jean Smith joins him in Mr. Hall’s class. (P)
Activities: After reading the book have the students make up a “tattle tale” page and share it with the class. Then create a class book. Teachers- create your own page for the book as well. For example, “Dear Principal Evans Every student in a class of 20 tattled every 20 minutes today. They know they are not to tattle!!! In this seven hour day 420 tattles were told by my students. 20 students x 3 tattles per hour x 7 hours = 420 Sincerely, Mr. Going-Crazy Harrell”

Synopsis: Ten years after being tricked, Rumpelstiltskin returns to the royal family to wreak vengeance using multiplication. Includes nonfiction math notes about multiplying by whole numbers. (I)

Synopsis: Ma has made a dozen cookies for Victoria and Sam to share. Each time the doorbell rings, more friends are welcomed in to share the cookies. More and more children mean fewer and fewer cookies to go around. This book shows the partition or sharing model of division. (P)
Activities: Collect information from the class on favorite cookies in a sentence style format. Then have small groups tally and graph the results of the class. Have stations set up with different materials (color tiles, beans, cubes and beads) and projects for students to do with a dozen of each material. Small groups of children can be supplied with 12 paper plates and 12 cookies, then they are asked to act out the story as more and more people are added to the "party".

Synopsis: Amos, a mouse who lives in Ben Franklin's hat, reveals that he is largely responsible for Ben's inventions, discoveries, and successes. He advises Ben during the meetings on the War of Independence. He also serves as a spy in France. (I)
Activities: Using the book description, have students make a scale model of Amos' room. Ben delivers food twice a week, two ounces of cheese, 1 one-inch slice of rye bread, and 88 grains of unhulled wheat. Have students
calculate how much food Amos, his parents, and 25 brothers and sisters received. Have them calculate the amount received in a year. How many loves of bread would that be? Calculate the cost using today's prices.


**Synopsis**: Zero is lonely because in Digitaria all the other numbers are playing Addemup and he has nothing to add. However, Count Infinity finds a very important use for zero when using his Numerator. Then Zero finds many other uses for him as he meets King Mutliplus. This book investigates the number zero as the additive identity, the multiplicative property of zero and how it is used to make “bigger” numbers. (A)


**Synopsis**: Ride along with trucker Jill and her dog as they add up and write number sentences for the animals zooming by. But these are no ordinary animals, and they're bound for the circus. (P)

**Activities**: Use animal crackers to model addition problems. Graph the animal crackers. Connections: Create art pictures for addition problems. Make up more animal stories.


**Synopsis**: This book teaches the measurement meaning of division as a group of friends go on different carnival rides. (I)


**Synopsis**: Explains the concept of subtraction through a rhyming text and number sentences about a descending elevator. (P)


**Synopsis**: Jack uses building blocks to build a robot, hot dog stand, boat, tower, building, and a rocket ship. As he builds the different shapes he adds more blocks by counting on. (P)

**Activity**: Have the students use geometric solids to build different structures as they count on from different numbers as done in the book. Then, create a class picture book like *Jack the Builder*.


**Synopsis**: This non-fiction book provides interesting facts about pandas, through description and pictures, chronicling two panda cubs born at the San Diego Zoo. The book presents many mathematical applications, such as adding and subtracting with base-ten blocks, as they relate the pandas facts. (P)


**Synopsis**: Each page offers a mathematical concept as a group climbs to the summit using common math equipment – plus sign, multiplication sign, numbers zero through nine, parentheses, and some graph paper. (A)


**Synopsis**: Use Hershey Kisses to learn basic facts. Watch the clowns move the candies to see the sums. Reading through this book, students learn vocabulary and mathematical symbols. (P)

**Fractions**


**Synopsis**: This book shows how a circle divided into fraction pieces can be used to illustrate all kinds of things. (P)


**Synopsis**: Explore fractions with Miss Prime in her classroom. Her students learn about fractions as a part of a whole and as part of a set. Miss Prime’s class then examines fractions in terms of food, marbles and money. (A)
Synopsis: Use Skittles bite size candies to explore order relations (< and >), addition, subtraction, and fractions. (I)

Synopsis: Food is cut into halves, quarters, and thirds to illustrate how parts make a whole. Simple recipes included. (P)

Synopsis: Everyday activities in the life of two baby polar bears born in the Denver Zoo, are used to teach about fractions. (I)

Synopsis: The Fractions team is coached by a math teacher who helps them learn while they play to become “number one” in soccer. (P)

Synopsis: With the use of equivalent fractions Dog and Cat divide their lunch. (A)

**Money And Decimals**

Synopsis: Money systems, history, facts and tricks are presented. (I)

Synopsis: Benny sets off in the morning with five shiny new pennies to spend and eventually buys something for his mother, brother, sister, dog, and cat. (P)

Synopsis: After spending her money on a purse, Katie is now faced with the problem of getting some money to put into it. She earns various coins to solve her problem. (A)
Activities: Find how many ways to make change for a quarter. Act out the story. Write about ways to earn money. For older students, have them determine how much change they could have in their pockets and not be able to make change for a dollar, a half-dollar, a quarter, a dime, or a nickel ($1.19).

Synopsis: Penny sells lemonade to buy a birthday card for her mother. She starts out selling a glass for 1¢, but the cost continues to climb for each glass she sells. Does Penny make enough, $1.00, to purchase the card?

Synopsis: Join four kids at Mr. Monopoly's Amusement Park. Solve money problems, involving dollars and quarters, as the kids ride rides, eat cotton candy, and play video games. For extra problems, do the multiple-choice questions. (P)

Synopsis: A boy receives a quarter from the tooth fairy and spends the day buying various objects and returning them, until he finally decides to buy his tooth back. (P)
Activity: Have the students determine the different ways one can make change for a quarter.

Synopsis: After school four friends go into a local store to buy a treat to share. While at the store they meet Penny, a good dog that needs a home because the owner is allergic to dogs. The kids think of different ways to raise $50 to buy Penny’s supplies so they can adopt her. They decide on a doggy bone bake sale.

Activity: Have your class determine all the different ways to get fifty dollars using only $1, $5, $10, and $20 bills.

**Ratio, Proportions and Percents**


Synopsis: Jack climbs an enormous beanstalk and encounters a very lonely boy giant. By using ratios and proportion, he makes toys that are the right size for each of them. (I)


Synopsis: This book describes the size of different dinosaurs by comparing them to familiar objects, such as a school bus, a trombone, or a bowling alley, more familiar. (I)

Activities: As the book compares the size of dinosaurs to known objects, now compare the size of the dinosaurs to the students. For example, a Tyrannosaurus Rex has teeth as long as a toothbrush, 7 inches. Estimate the height of a T-Rex if it’s proportional to the students. Use the proportion:

\[
\frac{\text{dinosaur's tooth length}}{\text{student's tooth length}} = \frac{\text{dinosaur's height}}{\text{student's height}}.
\]

Have the students create their own “How Big is a _____” book comparing themselves to things like wild animals, etc.


Synopsis: Corey decides to run for camp mascot, joining Sophie and Daniel. The camp paper polls the campers throughout the week as the election date draws near. (I)


Synopsis: Sir Cumference, Lady Di of Ameter, and Radius, their son, are involved in medieval adventure. A potion has changed Sir Cumference into a fire-breathing dragon. Join Radius on his quest through the castle to solve a riddle that will reveal the cure. It lies in discovering the magic number that is the same for all circle, pi. (I)

Activities: Have students go around the room and measure the circumference and diameter of 6 circular object and place the information in a table. Have them calculate the following ratio for each object and then find the average of the six ratios.

\[
\frac{\text{Circumference}}{\text{Diameter}}
\]

Give the students 6-8 different circles cut out of construction paper and a small bag of Cheerios. Have the students use the Cheerios to measure the circumference and the diameter of each of the circles. Have the students find the preceding ratio, and then average those ratios. Together, find the class average of the ratios.


Synopsis: Food and candy is always fun to introduce a mathematical concept. Use this book to introduce the concept of percentages. Furthermore, the book shows the relationship among percentages, decimals and fractions. This book is very much a hands-on model for percentages. (I)

Activities: Using a two-pound bag of M&Ms, divide the M&Ms among the students. Have the students determine the percentage of each color in their samples. Then collect the statistics for the entire class. They could compare this with those used by the Mars Candy Company. You could do this with other food item such as Skittles, Fruit Loops, etc.


**Synopsis:** Each book provides a history of the lives of fifteen mathematicians. At the beginning of each chapter is a brief biography of each of the mathematicians. Following is an interesting story of the mathematician’s mathematical contributions and his or her life as an individual. In the back of each book is a glossary of mathematical terms. (I)

**Activities:** Read the story of the life of Leonard of Pisa (Fibonacci). Introduce the students to the Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, etc. Have the students calculate the successive ratios

\[
\frac{1}{1}, \frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, \ldots
\]

These successive ratios, if continued, will approach the golden ratio,

\[
\frac{1 + \sqrt{5}}{2} \approx 1.61803\ldots
\]

Have students create their own Fibonacci-type sequence. For example, 3, 4, 7, 11, 18, 29, 57, 86, 143, 229, 372, 601, … Have the students continue their sequence out to 20 terms. Calculate the successive ratios as stated above. These ratios, if continued, will also approach the golden ratio.


**Synopsis:** This book provides you with the lives of ten mathematicians. Also included are activities that support the stories in the book. Some of the activities are directly related to the mathematician’s contributions, while others are not attributed to the mathematician but are consistent with some aspect of the mathematician’s life. There are a lot of great activities. Solutions to the activities are listed in the back of the book. (I)

**Activities:** Read the story about Thales. Have students estimate the height of other objects knowing their heights and the length of their shadows. Have them use the following proportion to find the height of the objects.

\[
\frac{\text{Length of student’s shadow}}{\text{Height of student}} = \frac{\text{Length of object’s shadow}}{\text{Height of object}}
\]

Read the “Portrait of Ramanujan,” and do one of the circle activities suggested in the Cindy Neuschwander reference above.


**Synopsis:** As you introduce a new concept to the class, consider its historical significance. This book provides a summary of over 100 mathematical stories about such topics as the origin of counting, ancient references of pi, calendars of the past, the concept of zero, the Fibonacci sequence, Pascal’s triangle, infinity, perfect numbers, percentages, etc. (I)

**Activities:** Read vignette # 92, “Percentages and Statistics: What Do They Tell Us? Do the suggested activities in the book. Have the students collect their own data, such as the eye color of each student in the class. Have them report their data in the form of percentages and draw appropriate conclusions.


**Synopsis:** How far could you hop if you were a frog? (90 feet?) This book compares the physical characteristics of animals to that of humans. If you were ____ , you could ____ . (I)

**Activities:** After reading the book, use the information provided in the back of the book to have the students calculate the distance, mass, etc. the students could jump, lift, etc. if they were like the animals stated in the book. Have the students research their favorite animals to find out some interesting facts about them. Then provide the students the material to construct their own books.

Synopsis: When a fire destroys everything, a family needs to replace a big, comfortable chair for mother. Little by little, everyone deposits change into a large jar until there's enough money to buy a new chair. This is a wonderful story about what is truly important in life. (A)

Activities: Challenge students to estimate how many unifix-cubes will fill a gallon glass jar. The exact number is then counted. Now each group has a jar and a different material to estimate for themselves. Have students find various combinations of coins for a particular amount. Graph coins in a jar, then calculate the total amount.

Algebra

### Sorting and Classifying


Synopsis: When she spills her grandmother’s button box, Kelly and her cousins try to sort them by size, color, and shape and they earn Grandma’s gratitude. (P)


Synopsis: A little girl uses sorting and classifying skills to tackle the leaning of her mess in her room. (P)


Synopsis: See how the kids categorize or classify the different kinds of cats at the local cat show. (P)

Activity: Have the kids bring in pictures of their favorite pets or favorite kind of animals. Then investigate different ways to categorize the animals.


Synopsis: In one of the stories in this book, "A Lost Button", Frog and Toad try to find a lost button from Toad's jacket. Toad lost a white, four- holed, big, round, thick button but the animals find other buttons that don't match. At last, Toad finds his button at home, so he makes a gift of the other buttons for Frog. (P)

Activities: Using buttons have children sort them by their attributes. Make up button clues and play "Guess My Button".

Number Patterns


Synopsis: Introduce factorials in a tale about a porcelain jar with a sea inside. In that sea is 1 island, and on that island are 2 countries, and in each country are 3 mountains, and so on up to 10! This book is a pictorial explanation of factorials. (I)

Activities: Decorate a large box to serve as a multiplying chest. Fill the chest by bringing in objects within objects. For example, two smaller boxes each hold three oatmeal boxes. Each oatmeal box holds four margarine tubs which each hold five-pill bottles. Challenge groups to create as many layers as they can. Have students create their own picture book using this one as a model. They may represent factorials or other mathematical concepts such as addition, time, and fractions.


Synopsis: On a family car trip, Molly uses mathematics to convince her younger brother that she has x-ray vision. (A)

Activity: After reading the book do several number tricks like the following and have the students show why these number tricks work using color tiles to represent the unknown number and round counters to represent the units.
Number Trick 1: Choose a number (encourage small numbers between 1 and 10). Add three to the number. Multiply the result by two. Add four to your new result. Divide this result by two. Subtract the first number thought of from this last result. “I can see your number. It is a 5.”

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<tr>
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<td>2. Add three to the number</td>
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<td>5. Divide this result by two</td>
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<td>3. Multiply the result by two</td>
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<td>6. Subtract the first number thought of from this last result</td>
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Number Trick 2: Choose a number. Multiply this number by two. Now add nine to your answer. Add the number first thought of to this result. Divide your new result by three. Add four to your latest answer. Subtract the number first thought of from your result. “I can see your number is 7.”

Synopsis: Twelve-year-old Robert hates his math teacher who annoys him with stupid word problems and won't let him use his calculator. Then, in his dreams, he meets a number devil who shows him what math is really all about: zeros and ones, infinite series and irrational numbers, primes and probability. This book provides a fun introduction to many interesting historical mathematical topics. (I)
Activities: Pose several of the problems introduced by the number devil for the class to solve. Then provide the historical background for the problem. Have students write their own number devil dream to share with the class.

Synopsis: As a family of five gets in and out of bed, children learn how to count the number of feet by twos. (P)

Synopsis: Squirrels can buy nuts in a variety of equal groups. (P)

Synopsis: The shows about to begin – but where are all of the lizards? Slowly they start to arrive in groups of 5 and 10. (P)

Synopsis: Different kinds of trucks moving Reese's Pieces show how to count to 100 by 5's. (P)

Synopsis: This book chronicles the adventures of the unusual Figg family after they leave show business and settle in the town of Pineapple. It features topics such as breaking codes with letters, symbols, and numbers. (I)
Activities: Have students investigate, create, and solve a variety of codes such as a substitution code, a pigpen cipher code (used by Confederate soldiers during the civil war), or a Vigenere cipher code. Have students plot ordered pairs on a coordinate grid. They can create pictures or messages.

Synopsis: With a counting rhyme, children learn how to skip count the crayons by 2's, evens, and odds. (P)

**Algebraic Thinking**

Synopsis: This book describes the various ways that the numbers 2, 3, and 4 occur in daily life. (P)
Activities: Have students make a table to solve problems using multiples. Have students write their own pages for the book.

Synopsis: This book shows how Even Steven and Odd Todd count their daily activities in even and odd amounts. (A)

Synopsis: Amanda loves to count everything, and can use repeated addition to solve problems, but not until she has an amazing dream does she finally realize that being able to multiply (array model) will help her count things faster. (A)

Geometry

Synopsis: Squares, hearts, circles, and other shapes are hidden in the illustrations for students to identify and count. (P)

Synopsis: Dissatisfied with its shape, a triangle keeps asking the local shapeshifter to add more sides and angles until it doesn't know which side is up. (A)

Synopsis: With only each other, their dog Riley, and the geometric hieroglyphics on the wall to help them, Matt and Bibi must use their math skills to locate a hidden burial chamber in a pharaoh’s pyramid. (I)
Activity: Before reading the book, give the students various polyhedra. Have them record the number of faces, vertices (corners), and edges for each block into three columns, F, V and E. Then, have the student look for the relationship among the three columns. They should discover Euler’s (pronounce oiler) formula, \( F + V = E + 2 \).

Synopsis: Assisted by his knight, Sir Cumference, and using ideas offered by his wife, Lady Di of Ameter, and son, Radius, King Arthur finds the perfect shape for his table. (I)

Synopsis: Radius, as a squire, has trained with Sir D’Grees to become a knight. Radius’ parents, Lady Di of Ameter and Sir Cumference, have agreed to let him go on his first quest to earn his knighthood. Learn how a family heirloom- a medallion in the shape of a perfect circle- helps Radius achieve his goal. Radius then names the different types of angles after things he encounters on his journey. (I)

Synopsis: Per and her cousin Radius go off to solve a mystery involving the Isle of Immeter. They must determine the area of a circle to solve the mystery. Thus, Per of Immeter’s name was used to represent the distance around the outside edge of any flat, straight-sided shape and the measure for the inside of the shape is called area after Count A’reana. (I)
Activity: Have student draw circles into grid paper and various radius lengths. Have them estimate the number of squares contained in each circle. Then, read the story. Using a compass, have students mark off the lengths of the sides of the squares that make up the grid on a semicircle for each circle. Next, have the students use Per’s method for finding the area of a circle. Finally, discuss the Endnotes in the book with your class.

**Synopsis:** Radius and Vertex are knights who set out together to find Edgecaliber, King Arthur’s sword. The knight who finds it will become the next king. Learn how Vertex and Radius solve this adventure by discovering and using Euler’s formula. (I)

**Activity:** Place several geometric solids like prisms and pyramids around the room. Have groups of 2 or 3 circulate to each shape and record the number of Faces, Vertices and Edges in a table with these heading in this order. Then, ask the students to look for a pattern among the columns in the table. If they struggle, have them create another column labeled “faces + vertices.” They should discover that Faces + Vertices = Edges -2 (Faces + Vertices – Edges = 2)


**Synopsis:** Jan sends her friend Nick email messages describing how she and her cousins learn about 3-D shapes as they try to assemble a present for their grandmother’s birthday. (A)

**Activities:** Write mystery shape riddles. Pair up to do listening/following directions activities. Put shapes in a cloth bag. Have students feel without looking inside to determine what is in the bag. Make 3-D solids using 2-D nets.


**Synopsis:** Zach’s favorite day of the week is Friday; however, he begins to question this as he and his classmates are to bring different items to class to show how these items meet some given mathematical criteria. Each week Zach forgets, but to all the students’ surprise he comes up with something from his pocket. (I)

**Activities:** Before reading the book, introduce the students to the Moebius strip (this is in the back of the book) and have them investigate its’ properties. After having the students create a Moebius strip, have them first predict what will happen when they trace along the center of the strip. They should discover it has one surface. Then have them predict what will happen if they cut along their tracings. When they do the cutting, they should discover it is still one loop but with an extra twist. After reading the book, give the students a 4” by 6” note card. Have them try to find a solution to Zack’s Expanding Frame. A solution is given in the back of the book.


**Synopsis:** Children will learn the names of 2-D shapes mentioned in this book through riddles (P)


**Synopsis:** Grandfather tells a story about shape-changing fox fairies that try to best each other until a hunter brings danger to both of them. Tangram puzzles are used to illustrate each animal in the story. (A)

**Measurement**

**Measurement Units**


**Synopsis:** A cow, a donkey, a sheep, a pig, and a mouse decide to go out in Mr. Peffer's boat. As each animal gets in the boat, the reader is asked, "Who sank the boat?" This is a delightful story (with wonderful illustrations) that teaches the principles of balance and density. (P)

**Activities:** Have students select an object in the room that will fit on the balance, and then they draw a picture. Now the class sequences the object pictures from lightest to heaviest. The masses of the objects are determined to see if the sequence is correct. Make mice and sheep spinners. Students take turns spinning and tallying which animal the spinner lands on. The animal with the most tallies sinks the boat. First have the spinners divided so that each animal has the same chance. Next, make the spinner favor one of the animals.
Synopsis: The seating for a family reunion gets complicated as people rearrange the tables and chairs to seat additional guests. (I)

Synopsis: While trying to make a piggy bank, a young girl learns the importance of using standard measurements. Includes related activities. Area and perimeter are illustrated in a real-life context. (P)

Synopsis: In order to have fun at a tug-of-war, forest animals balance the teams by using a see-saw. Includes nonfiction math notes for meanings of equal. (P)

Synopsis: This book introduces the use of nonstandard measurement as three friends compete in a sand castle building contest. (A)
Activities: Measure with nonstandard units such as baby steps or hands. Use marshmallows to build a "castle". Measure with nonstandard shovels.

Synopsis: Thrown in jail because the bed he made for the Queen is too small, an apprentice comes up with a more accurate way of measuring size. Emphasizes the need for standard measurement. (A)

Synopsis: When bad guy Buzzsaw Bart shows up with a challenge in the town of Cowlick, everyone discovers that scale drawings can be the secret of success. Who will walk away the winner, Louie Cutorze or Buzzsaw Bart, from the showdown at high noon and who will be cut down to size? (I)
Activities: After reading the book, have students make “wigs” with an object on top of it that is proportional to an object found in the class. In doing this, they must take careful measurements and produce a scale model. Another activity would be to give the students a picture of a simple heart on a grid; then, give each student a square and have them copy a potion of the heart onto their square which is much larger than the one of the squares on the grid. Now put all the pieces together to create one big heart. The heart can be placed on a grid with the number of squares corresponding to the number of students or simply do several different shapes on the grid. Follow this activity by giving them one-inch grid paper and a one-centimeter grid transparency sheet. Have the students place the grid on an object or picture and enlarge the figure by copying it onto the one-inch grid paper using the grid.

Time

Synopsis: Through the televised American Batstand, a community of bats dances through the day as Click Dark calls the dance each hour on the hour. The bats begin with the shrug, and then move through such dances as the jitterbug, the swim, the locomotion, and the twist. At the finale is a performance from the bat with the blue suede shoes. (P)

Axelrod, A. *Pigs on a Blanket.* Trumpet Book Club.
Synopsis: The Pigs decide to go to the beach to surf the waves, but before they know it the beach is closed. Where did the time go? (I)

**Synopsis**: The grouchy ladybug is looking for someone to fight, no matter how big. From sunrise to sunset, the ladybug has nothing but hostile encounters. Then the ladybug meets its match and finally learns the value of friendship. (P)

**Activities**: In groups, have students draw each creature from the book and glue them in order that they meet the ladybug. Have students make paper aphids by tearing up bits of green colored paper. They are then placed on a paper leaf. The students are very hungry but very polite ladybugs who agree to share the aphids, so they divide them. Subtraction problems may also be solved. Have students use geometric shapes to create the animals encountered in the book.


**Synopsis**: It is the Farmer’s birthday and the animals want to surprise him by doing all his chores before he awakes. The animals list all the chores and the times the Farmer completes them. The animals have all night to get the chores done. As the animals discuss the time, clocks are posted on the page that shows both the analog and digital times. (P)


**Synopsis**: The puppies keep track of time on the trip to Grandma’s birthday party. (P)


**Synopsis**: By using riddles about everyday activities, children will learn how to tell time and enjoy doing it. (P)


**Synopsis**: Through a child's daily activities you notice the passage of time and the book shows how time can be represented in analog and digital format. (P)


**Synopsis**: Katie and Cameron go to the rodeo to help their uncle, Cactus Joe. Each day their uncle gives them different tasks to complete at certain times. As they remember their task, their uncle gives them more important jobs to do. This book stresses the importance of a using a time schedule and following it. Also, in the back of the book are some suggested activities. (A)


**Synopsis**: Follow Jiggs, a tiny chimpanzee, as he grows from a wobbly infant to a wild and wonderful toddler. Along the way you can learn about clocks, calendars, time lines and other ways of keeping time records (I)


**Synopsis**: A young boy learns how important it is to know just how long a minute is. (P)

**Activities**: Estimate how many stars can be drawn in one minute. Do it, and then count by tens.

**Data**

**Data/Probability**


**Synopsis**: After a reluctant start to the day, Gary finds many circumstances at the family reunion that fit nicely into various kinds of graphs. (A)

**Activities**: Have the students observe their schoolmates throughout the day. Have them make graphs of what they observe. The students can share their findings. You can then make a class book. You could have them collect graphs from the local newspaper like those discussed in class. Have students go to the
grocery and observe whether customers use paper bags, plastic bag or other to take their purchase home. At the store the can observe how the person pays (money, plastic, or check) for their purchase.

Synopsis: Marco surveys his friends and uses bar graphs to convince his father to raise his allowance. (P)

Synopsis: This story engages children in thinking about the probability idea of fair events. (A)

Synopsis: When Bossy Mia starts a newspaper she refuses to publish Amy’s survey results unless they are in pictograph form, which challenges Amy’s math skills as well as their friendship. (P)

Synopsis: After buying new clothes, the chimp begins to plan out various outfit combinations for the coming week. How many can there be? (P)

Synopsis: A family collects data and makes charts to determine a location for the best vacation ever. (A)
Activities: Plan a field trip. Make graphs using common manipulatives.

Synopsis: At the picnic on the last day of school, James, his friends, and the cafeteria lady make a variety of ice-cream sundaes, using mathematics to figure out how many different kinds they can create. (I)
Activity: After reading the book, use different colored counters to act out the story and to solve other counting problems

Synopsis: T.J., the tiger cub, has his growth recorded using picture graphs, bar graphs, and line graphs. Two color line graphs and bar graphs are used to compare T.J.’s growth to his father’s growth as a small cub. A circle graph shows the different types of tigers and the percentage of each type of tiger in the world. This book is a gem when discussing the appropriate ways to represent data graphically. (I)

Synopsis: A young boy uses different kinds of charts and graphs to present information about his life. Includes related activities. (P)

Synopsis: This story grabs children's interest with an engaging mystery and gets them thinking about time, money, estimation, measurement, and logical reasoning. (I)

Synopsis: This is the classic story of a peddler who sold caps by carrying them on his head. One day, after taking a nap, he discovers some monkeys wearing all his caps. He must find a way to get the caps back. (A)