Literature and Games:
Great Ways to Teach Fractions
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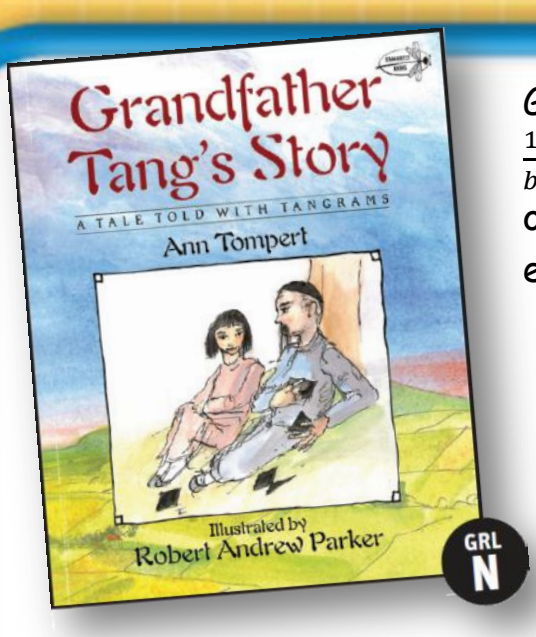
Spark children's mathematical imaginations with authentic literature! A math and literature program (such as Marilyn Burns, *Math Reads)* helps teachers invite students in Kindergarten through Grade 5 into the world of mathematics through delightful and engaging children's books.

Developed by Marilyn Burns and a team of Math Solutions master teachers, lessons make explicit connections to the College & Career Readiness Standards and help students learn to think, reason, and solve problems. Books can be contemporary or classics. They should address the range of math content at each grade level and support regular math instruction by:

- Introducing off math topics
- Helping students build mental models for abstract concepts
- Deepening conceptual understanding
- Reinforcing topics previously taught

In reading classes, teachers . . .	In math classes, teachers . . .
ask students to make predictions about what might come next when reading a story	ask students to make estimates before solving problems
use writing and oral communication as important aspects of instruction	have students write down and discuss their ideas in order to help them develop, cement, and extend their understanding
do not expect children's writing to be identical, even when writing about the same topic	can encourage different methods for reasoning, solving problems, and presenting solutions
know vocabulary instruction is integral	can start a word chart for math terminology, consistently use correct math vocabulary, and encourage children to do the same
use read-aloud books to provide students with common experiences from which they can learn	use children's books that can provide a stimulus for problem-solving
blend whole-class discussions, small-group instruction, and individualized reading and writing	Employ blended learning such as whole-class discussions, small-group instruction, and individualized reading and writing

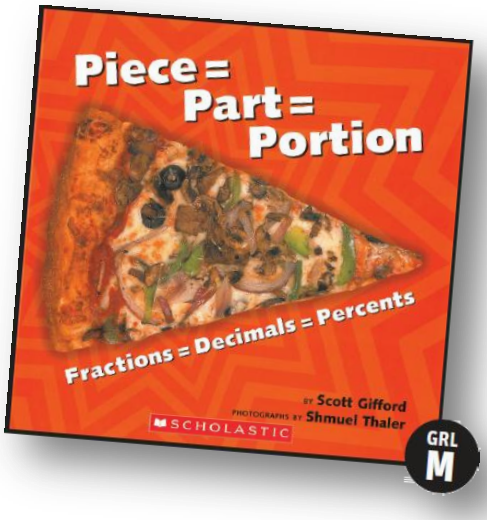
Go to **www.mathsolutions.com,** click on Publications, and you'll find a link to the At-a- Glance Chart of Children's Literature.)



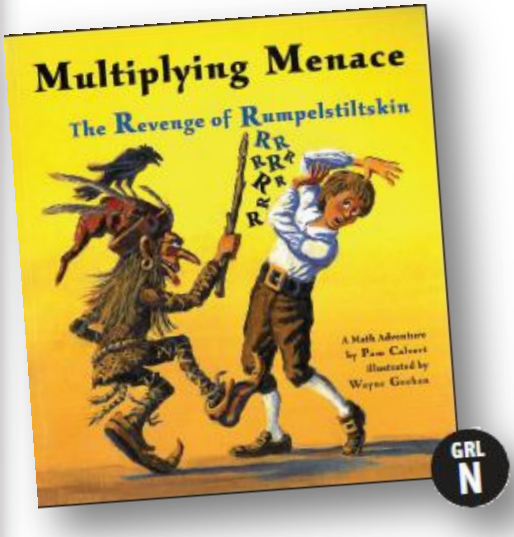
Grade 3 explain that the unit fraction $\frac{1}{b}$ represents the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero whole number

Written by: Ann Tompert
Illustrated by: Robert Andrew Parker

Grade 4: compare two fractions with different numerators and different denominators and represent the comparison using the symbols >, =, or <



Written by: Scott Gifford
Photographs by: Shmuel Thaler



Grade 5: represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models

Written by Pam Calvert
Illustrated by Wayne Geehan

Strategic Games in Math Class

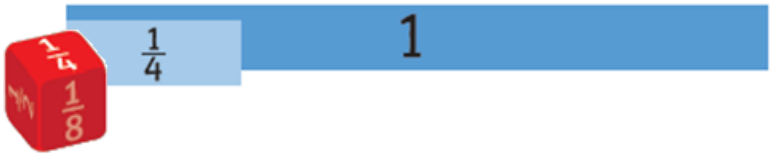
Students who believe in the importance of learning mathematics are more likely to be motivated to do the mathematics. The use of contextually based problems and games provides intrinsic motivation and underscores the value of mathematics for students.

Gamification in education involves using games – in their many forms – to motivate and engage students in the learning process. Students' achievement in mathematics is directly related to their attitudes and active engagement. Games provide goals (purpose) and different choices about achieving those goals (agency), with immediate feedback on progress toward those goals. Through game play, students recognize the value of extended practice, and develop qualities such as persistence, creativity, and resilience.

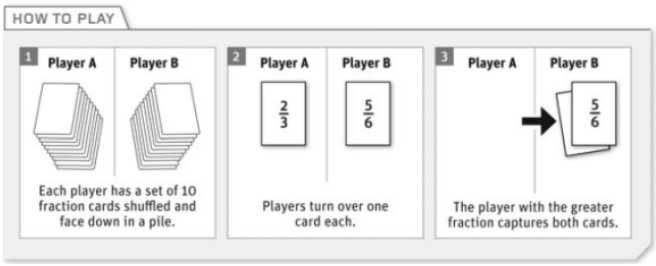
Establishing productive discourse and using consistent routines structures student collaboration and encourages communication. Discourse allows students to learn from one another, correct misconceptions, apply mathematical thinking, and discuss sound reasoning and problem solving strategies.

- **Choose games that are accessible to all students.** Use numbers and operations that knew all of the children could solve. When the math is accessible, students can focus on learning how to play.
- **Play cooperatively and competitively.** Cooperative games foster communication and classroom unity. Competitive games help students test their skills, take risks, and learn to be graceful winners and losers.
- **Choose games that require reasoning and chance.** Games that combine strategic thinking with an element of chance are especially effective for providing practice and promoting thinking, reasoning, and problem-solving. The chance aspect—rolling a number cube or using a spinner—helps level the playing field and makes it possible for students of varying abilities to enjoy playing together.
- **Teach the game to the entire class at the same time.** Play sample games as many times as needed to resolve any confusion before expecting students to be successful independently.
- **Start a math games chart.** Add the name of each game as you teach it. This creates a repertoire of independent math activities that you have approved and that are accessible to all. When students have extra time, direct them to the chart for an activity.
- **Establish clear goals and progress indicators.** Effective mathematics teachers establish learning cultures that engage students in the meaningful learning of mathematics by promoting mathematical applications through games. Students can set goals and view progress toward desired outcomes.

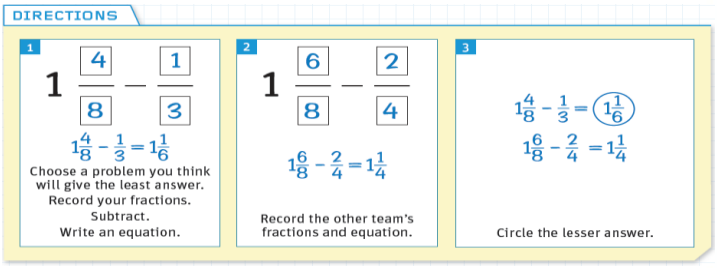
Cover & Uncover/ Fraction Action

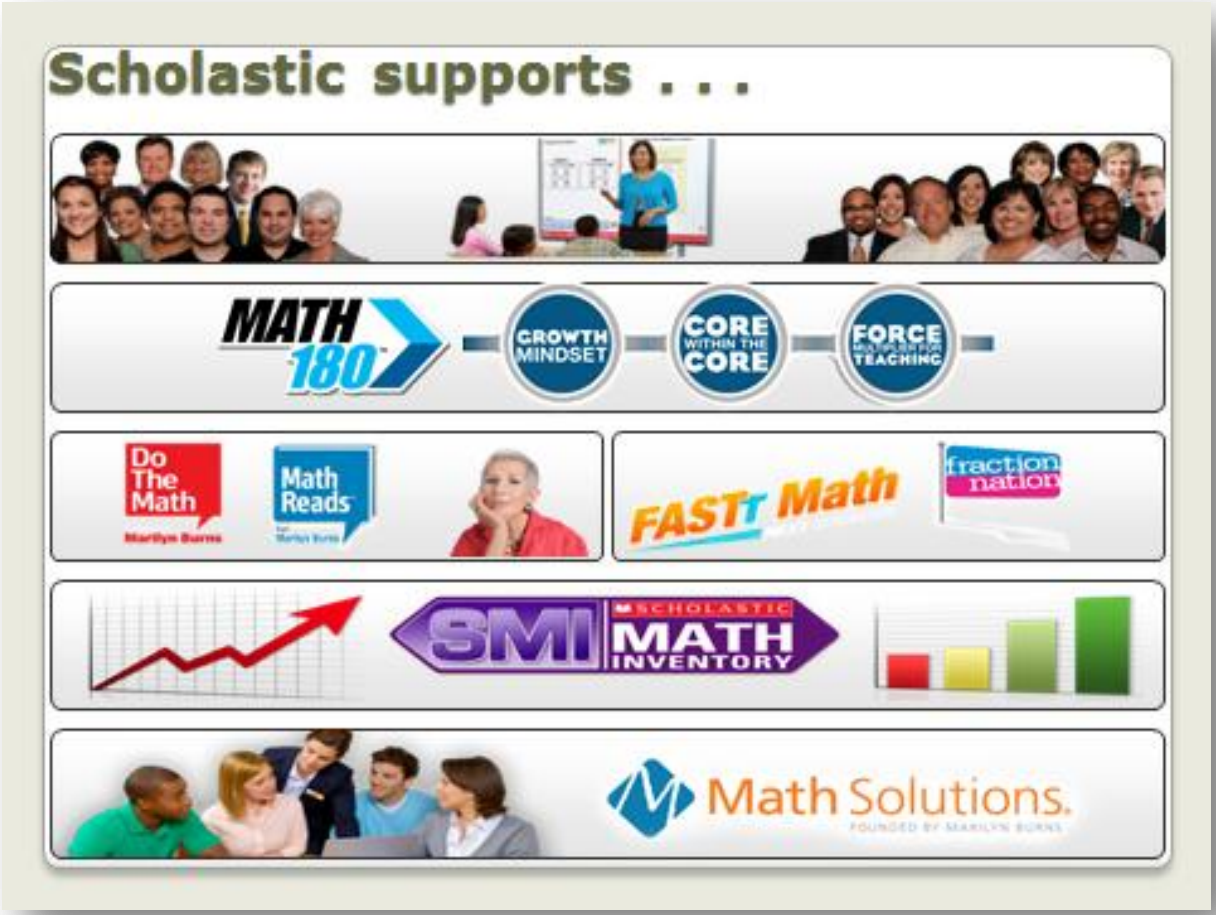


Fraction Capture



Compute & Compare





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