

AfterSchool KidzMath™

**AfterSchool KidzMath Games and AfterSchool KidzMath Story Guides
Research Base**



**DEVELOPMENTAL
STUDIES CENTER™**

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For more information, please contact us at 800.666.7270 or on the web at www.devstu.org

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AfterSchool KidzMath™ Research Base

Research-based and created specifically for use in after-school settings, the *AfterSchool KidzMath* program is a mathematics enrichment curriculum designed to promote the mathematical learning and social development of children in grades K–6. Closely aligned with the standards of the National Council of Teachers of Mathematics, the program includes cooperative games and literature-based story guide activities that give children opportunities to practice and build key mathematical skills and concepts in fun, engaging ways, and become confident math learners.

The goals of the AfterSchool KidzMath™ program are to:

- Build children’s mathematics skills and understanding of number, measurement, and geometry concepts
- Increase their opportunities to explore mathematics with adults and peers in a supportive, collaborative environment
- Foster their social development, particularly their abilities to be responsible, make decisions, give and get help, and collaborate and communicate with others

The AfterSchool KidzMath™ program builds mathematics skills based on the latest research

The approaches used by the *AfterSchool KidzMath* program to improve children’s mathematical understanding and competency are based on the latest research.

Why AfterSchool KidzMath uses games to teach mathematics:

- Children who are allowed to become absorbed in their playing are capable of better intellectual performance than those who are drilled and pressured. Playing provides better motivation to finish difficult tasks (Kauke and Ziller, 1996).
- The success of all mathematics teaching depends on the active involvement of the learner. Games promote active engagement and a positive social environment (Kauke and Ziller, 1996; Ernest, 1986; Kilpatrick, 1985; Krulik, 1977).
- Using games (as part of mathematics learning) can result in a more flexible attitude and help create a better environment for learning. Aspects of play such as exploration, invention, and a reduction in the seriousness of the consequences of errors create an ideal environment for problem solving (Bruner, 1983).
- Games are fascinating to children, and children want to play them repeatedly if the games offer a challenge yet are not so complicated that they stifle participation (Williford, 1992).
- Games give children a chance to be imaginative and creative—essential qualities for good problem solving, a crucial goal of mathematics teaching (Kauke and Ziller, 1996; Bruner, 1983; Keller, 1990; Krulik, 1977).

Why AfterSchool KidzMath uses children’s literature to teach mathematics:

- Math-related stories provide rich opportunities to engage students in explorations of mathematics concepts (Balka and Callan, 2001; Whitin and Wilde, 1995).
- Math-related literature can spark children’s imaginations, engage them in exciting problem solving, and help them relate mathematics to their own and others’ experiences (Burns, 1992; Whitin and Wilde, 1995).
- Children’s math literature is a valuable tool for helping children develop positive attitudes toward mathematics (Thiessen, Matthias, and Smith, 1998).
- Children make sense of mathematical concepts naturally through math stories. For this reason, children’s math literature can be used effectively to show how to view the world from a mathematical perspective. Through stories, children can see that mathematics involves a way of thinking (Whitin and Wilde, 1995).

- Math stories can show children how math is used in the “real world” in ways that math textbooks usually do not (Braddon, Hall, and Taylor, 1993).
- Children’s mathematical literature provides opportunities for children to communicate mathematically. Stories provide a natural meaningful context for mathematical ideas and chances to grab onto concepts and discuss and explore them (Whitin and Wilde, 1995).
- Children develop greater responsibility for their learning when they are given opportunities to interpret and extend ideas from stories in meaningful ways (Whitin and Wilde, 1995). (The math exploration, drama, art, and movement activities included in the *AfterSchool KidzMath* program provide children with these opportunities.)

Why the AfterSchool KidzMath program focuses on number, measurement, and geometry:

- Developing children’s number sense is the most important goal of elementary mathematics instruction (National Council of Teachers of Mathematics, 2000).
- Measurement is one of the most widely used applications of mathematics, but on the TIMSS test, American fourth graders scored lower in measurement than in any other area of mathematics (Third International Mathematics and Science Study [TIMSS], 1997).
- TIMSS also found that elementary school instruction can help children learn shape names and early geometry concepts, but may not develop the conceptual foundation needed to tackle more abstract and sophisticated geometry.

Based in part on this research, **the AfterSchool KidzMath program purposely uses strategies to increase children’s enjoyment and interest in mathematics, increase their mathematical understanding and skills, and increase their ability to work with others.**

- **AfterSchool KidzMath activities build math skills and understanding.**
The Games and Story Guide activities help children develop their skills in counting, number relationships, addition, subtraction, number sense, multiplication, division, fractions, decimals, and percents. The activities help children develop mathematical problem-solving strategies and give them opportunities to communicate about mathematics, express their thinking in a variety of ways, and consider the perspectives and mathematical approaches of others.
- **Noncompetitive learning environments foster enjoyment and interest.**
The noncompetitive, cooperative learning environment established in the *AfterSchool KidzMath* program helps children gain confidence in their math concepts and skills, allows everyone to be successful, and encourages children to help and support each other regardless of their math or language abilities.
- **Noncompetitive, cooperative activities equalize students’ opportunities to practice math skills.**
Competitive activities typically favor more skilled students, who gain more time to practice math skills as less skilled students are eliminated from play. Cooperative, noncompetitive activities, on the other hand, are equally inclusive of less skilled students, giving them a greater opportunity to practice and build new skills.
- **AfterSchool KidzMath activities are adaptable for all skill levels.**
Each game targets a particular age group, but many can be adapted to be more or less challenging. All can be used to provide less skilled children with needed practice.
- **Cooperative activities support social learning.**
By integrating social skill building into the games and activities, the *AfterSchool KidzMath* program helps leaders support children in building positive social relationships and skills. The activities help the children develop the skills of staying involved while waiting one’s turn, deciding fairly who goes first, being respectful when others make mistakes, encouraging others, asking for help and giving help in a respectful way, making decisions together, and communicating effectively with others.

- **The program provides support for English Language Learners.**
In the *AfterSchool KidzMath* Games, leaders are given tools for demonstrating the activities to ensure that all the children understand. In the *AfterSchool KidzMath* Story Guides, leaders are encouraged to explain, demonstrate, and act out the meaning of difficult words. The literature books used in the program represent a variety of cultures, and include some that are available in both English and Spanish.
- **The AfterSchool KidzMath program provides support for after-school professionals.**
Clear, step-by-step instructions for each game include a list of materials needed and offer a mathematical learning focus and a social development focus.

AfterSchool KidzMath Evaluation

Researchers from Developmental Studies Center (DSC) conducted an evaluation of the *AfterSchool KidzMath* program, involving six after-school sites in the San Francisco Bay Area. Four methods of data collection were used in the study: (1) participants' evaluations of staff development workshops, which rated the extent to which each workshop component contributed to participants' learning and understanding; (2) follow-up surveys that asked all participating staff to describe the frequency and nature of their use of *AfterSchool KidzMath* Games and Story Guides and the outcomes for students that had resulted from participating in the program; (3) telephone interviews that probed the topics covered in the follow-up survey; and (4) classroom observations and interviews to understand more fully the way the program is used and to provide an independent assessment of implementation.

This study showed that the *AfterSchool KidzMath* program was positively received by the staff and youth at the participating sites. While implementation varied, staff consistently reported that the *AfterSchool KidzMath* program had a positive impact on children. They reported that the children at their sites:

- Improved their level of mathematics skill and understanding
- Were helped by the program to feel more positive about mathematics
- Enjoyed the Games and Story Guide activities
- Deepened their engagement with the games and activities over time
- Improved their relationships with each other

Overall, site staff found that the Games and Story Guides were clear and useful, and that the *AfterSchool KidzMath* program fit well with and supported their school programming.

A large-scale, comparative, two-year evaluation of the *AfterSchool KidzMath* program is currently being conducted at 44 sites affiliated with Sacramento START (Students Today Achieving Results for Tomorrow), with funding from the National Science Foundation.

AfterSchool KidzMath™ Frequently Asked Questions

Q: What is the *AfterSchool KidzMath* program?

A: The *AfterSchool KidzMath* program is a hands-on mathematics program for grades K–6 that was created specifically for after-school and summer school settings. The program uses games and activities to increase children’s enjoyment of and interest in mathematics, their mathematical understanding and skills, and their ability to work with others.

Q: How is the *AfterSchool KidzMath* program unique?

A: It is designed specifically for after-school settings to provide opportunities to complement in-school learning in active and engaging ways. The games and activities are cooperative, easy to use, and fun. The materials are designed to be adaptable to a variety of after-school or summer program settings, such as during whole-group activity time, free-choice time, math clubs, tutoring programs, and homework time.

Q: What are the *AfterSchool KidzMath* goals for children?

A: It helps children in two areas—mathematics and social development. Through the *AfterSchool KidzMath Games*, children develop their skills in counting, number relationships, addition and subtraction, multiplication and division, fractions, decimals, and percents. Through the *AfterSchool KidzMath Story Guides*, children develop mathematical understanding in number, measurement, and geometry. The program also helps children develop the social skills of making decisions, giving and getting help, and working and playing together responsibly.

Q: What *AfterSchool KidzMath* materials are available?

A: The program includes:

AfterSchool KidzMath Games

- **Primary (grades K–2)** Includes 20 cooperative math games.
- **Intermediate (grades 3–6)** Includes 30 cooperative math games.

Each set contains a Leader’s Kit and five identical Kids’ Kits in a sturdy storage box. The Leader’s Kit provides materials for large-group games and a Leader’s Guide with directions for all of the games, including suggestions for giving support during the game, ideas for follow-up discussion, and ways to make the game more or less challenging depending on children’s mathematical abilities. The Kids’ Kits contain materials to play the small-group games. Several groups of children can play many different games at the same time.

AfterSchool KidzMath Story Guides

- **Primary (grades K–2)**
- **Intermediate (grades 3–6)**

The Guide sets are keyed to children’s books with mathematical themes in number, measurement, and geometry. Each set includes ten books, a story guide for each book, and math tools (for example, rulers, tangram sets, and calculators) needed to do the activities with up to 20 children. Each story guide contains suggestions for questions to ask during a read-aloud of one of the books and three math-related activities. The activities include creative games, drama, art, cooking, and movement.

On-Site Support Kit: An On-Site Support Kit is available to support site staff who are implementing the *AfterSchool KidzMath* program. The kit includes a handbook, five videos in both VHS and DVD formats, and a CD-ROM of presentation materials.

Q: How long does it take to play a game?

A: Each game runs between 20 and 45 minutes and is designed to be played over and over again.

Q: How long does it take to do a story guide?

A: It usually takes about 30 minutes to read and discuss the story. Each activity runs an additional 30 to 45 minutes.

Q: Why are the *AfterSchool KidzMath* Games cooperative rather than competitive?

A: At most after-school sites, children of different ages and skill levels play together. Playing a math game competitively is not fair for the younger or less-skilled children. Those children, who are the most in need of math practice, are also most likely to lose their turn or be “out,” and miss the opportunity to practice. More important, losing consistently can destroy children’s enjoyment of math, their self-esteem, and their confidence in their mathematical abilities. Playing math games cooperatively makes them fair and fun for all and allows everyone to be successful and to learn.

Q: Was the *AfterSchool KidzMath* program piloted or field-tested?

A: Yes, both, extensively. First, the authors from Developmental Studies Center piloted draft materials in the San Francisco Bay Area. Then, staff from more than 40 community- and school-based after-school sites across the country field-tested *AfterSchool KidzMath* materials. The authors incorporated the field-testers’ feedback in the published version of the program.

Q: Is the *AfterSchool KidzMath* program research-based?

A: Current research and thinking about mathematics education supports the instructional strategies used in the *AfterSchool KidzMath* program. Many children need to spend extra time—more than they get in school—on certain foundational skills in mathematics. With carefully designed activities, after-school programs can provide the necessary practice.

Q: Does the program support the mathematics standards?

A: The program was designed to support the Principles and Standards for School Mathematics published by the National Council of Teachers of Mathematics in 2000. The *AfterSchool KidzMath* Games and Story Guides contain charts that correlate each game or story guide to the standards.

Q: Who is using the *AfterSchool KidzMath* program?

A: School-based sites, community-based organizations, intermediary organizations, and school districts are implementing the *AfterSchool KidzMath* program. They include: LA’s BEST (Los Angeles Better Educated Students for Tomorrow); Long Beach CORAL; Sonoma SERVES Cool School; after-school sites in the Kansas City, Missouri School District; Children’s Aid Society sites in New York City; and sites across the nation operated by Girls Incorporated, the I Have a Dream Foundation, the Boys and Girls Clubs of America, and the YMCA of the USA. Sites using the *AfterSchool KidzMath* program are in urban, rural, and suburban settings.

Q: Is Staff Development available?

A: Yes. We offer half-day and full-day experiential hands-on workshops using *AfterSchool KidzMath* strategies and materials. Staff Development fees are \$1,500–\$2,000 for a one-day workshop. Costs include all workshop materials. Staff Developer travel expenses are additional. An on-site support kit for those sites that would like to conduct their own staff development workshops is also available.

Math and Social Skills at a Glance for AfterSchool KidzMath™ Games, Grades K–2

The *AfterSchool KidzMath* games help children develop their understanding of and flexibility with numbers. In particular, they help children develop skills in three important areas: counting, number relationships, and addition and subtraction. The games also help

children learn to be responsible, make decisions, and help each other. This chart lists the math and social focus for each game. Use this chart to help you pick games that are appropriate for your children.

GAME	MATH SKILLS	SOCIAL SKILLS	GRADES
COUNTING GAMES			
Dot Dazzle , p. 3	<ul style="list-style-type: none"> Identify the number of objects in a group without counting (subitize) Count to 6 	<ul style="list-style-type: none"> Be respectful when others make mistakes 	K–1
Star Struck! , p. 9	<ul style="list-style-type: none"> Identify the number of dots on a die without counting (subitize) Count to 6 	<ul style="list-style-type: none"> Be respectful when others make mistakes Give others time to think before offering help 	K–1
Handy Handfuls , p. 15	<ul style="list-style-type: none"> Estimate Count to 25 	<ul style="list-style-type: none"> Decide fairly who will go first, second, and so on Be respectful of each other's feelings 	K–1
Stack Back , p. 21	<ul style="list-style-type: none"> Count and order numbers 10 backward from 	<ul style="list-style-type: none"> Help without giving the answer Give others time to think before offering help 	K–2
Hand Off , p. 27	<ul style="list-style-type: none"> Count by 5s 	<ul style="list-style-type: none"> Be respectful when others make mistakes Stay involved while waiting for a turn 	1–2
NUMBER RELATIONSHIP GAMES			
Beat the Dice , p. 33	<ul style="list-style-type: none"> Add to 12 Use the number relationships "more than," "less than," and "equal to" 	<ul style="list-style-type: none"> Encourage others Make decisions together 	1–2
Rollingo , p. 41	<ul style="list-style-type: none"> Add to 12 Use the number relationships "more than," "less than," and "equal to" 	<ul style="list-style-type: none"> Give help respectfully when asked Encourage others 	1–2
Musical Chairs with Numbers , p. 47	<ul style="list-style-type: none"> Use the number relationships "more than," "less than," "equal to," and "between" 	<ul style="list-style-type: none"> Ask for help when needed Play safely 	1–2
Guess My Number , p. 53	<ul style="list-style-type: none"> Ask mathematical questions Use the number relationships "more than," "less than," and "between" 	<ul style="list-style-type: none"> Be respectful of others' answers 	1–2

GAME	MATH SKILLS	SOCIAL SKILLS	GRADES
ADDITION AND SUBTRACTION GAMES			
Free the Fish , p. 61	<ul style="list-style-type: none"> Find two numbers that add up to 5 	<ul style="list-style-type: none"> Give others time to think before offering help Give help respectfully when asked 	K–1
Blast Off! , p. 67	<ul style="list-style-type: none"> Identify the number of objects in a group without counting (subitizing) Add to 10 	<ul style="list-style-type: none"> Take turns 	K–1
Concentrate on Ten , p. 73	<ul style="list-style-type: none"> Find two numbers that add up to 10 	<ul style="list-style-type: none"> Work together toward a goal Ask for help when needed 	1–2
Funny Bug , p. 79	<ul style="list-style-type: none"> Add to 12 	<ul style="list-style-type: none"> Consider all ideas before making a decision Be respectful of one another’s drawings 	K–2
Hop Out , p. 85	<ul style="list-style-type: none"> Add and subtract to 10 	<ul style="list-style-type: none"> Make a plan with a partner 	1–2
Creature Catch , p. 91	<ul style="list-style-type: none"> Add and subtract to 18 	<ul style="list-style-type: none"> Ask for help when needed Give help respectfully when asked 	1–2
Best Out of Three , p. 97	<ul style="list-style-type: none"> Add to 18 Use addition strategies 	<ul style="list-style-type: none"> Be persistent Help without giving the answer 	1–2
The Leader Says , p. 103	<ul style="list-style-type: none"> Add and subtract to 18 	<ul style="list-style-type: none"> Be respectful when others make mistakes 	K–2
Zero Zone , p. 111	<ul style="list-style-type: none"> Subtract from 25 	<ul style="list-style-type: none"> Be respectful when others make mistakes 	1–2
Marble Mania , p. 117	<ul style="list-style-type: none"> Count by and add 5s and 10s 	<ul style="list-style-type: none"> Decide fairly who goes first, second, and so on Stay involved while waiting for a turn 	K–2
Countdown , p. 123	<ul style="list-style-type: none"> Count backward and subtract by 5s and 10s 	<ul style="list-style-type: none"> Make decisions together 	1–2

Math and Social Skills at a Glance for AfterSchool KidzMath™ Games, Grades 3–6

The *AfterSchool KidzMath* Games help children develop their understanding of and flexibility with numbers. In particular, they help children develop skills in three important areas: number sense; multiplication and division; and fractions, decimals, and percents.

The games also help children learn to be responsible, make decisions, and help each other. This chart lists the math and social focus for each game. Use this chart to help you pick games that are appropriate for your children.

GAME	MATH SKILLS	SOCIAL SKILLS	GRADES
NUMBER SENSE GAMES			
Save \$10.00 , p. 3	• Add and subtract multiples of 25 using money	• Stay involved while waiting for a turn	3–5
Spinning for Dollars , p. 9	• Add multiples of 5 and 10 using money	• Give others time to think before offering help	3–5
Flick , p. 15	• Add and subtract multiples of 10	• Consider all ideas before making a decision • Be respectful when others make mistakes	3–6
Bounce Back , p. 21	• Subtract multiples of 100	• Encourage others • Play safely	3–6
What’s My Rule? p. 27	• Recognize number patterns • Relate numbers to other numbers	• Stay involved while waiting for a turn • Be persistent	3–6
Number Detective , p. 33	• Recognize that the position of a digit determines its value	• Explain one’s thinking • Be respectful when others make mistakes	4–6
MULTIPLICATION & DIVISION GAMES			
Ant Hill Picnic , p. 41	• Divide by 12 or less with and without remainders	• Give others time to think before offering help	3–4
Rectango , p. 47	• Use a visual model of multiplication • Multiply by 6 or less	• Consider all ideas before making a decision	3–5
Lonely Aces , p. 53	• Divide by 7 or less	• Give others time to think before offering help • Stay involved while waiting for a turn	3–4
Multiplication Basketball , p. 59	• Multiply by 12 or less • Add	• Encourage others	3–6
Multiplication Bowling , p. 65	• Multiply by 10 or less • Add to 200 or less	• Make decisions together • Stay involved while waiting for a turn	3–6
Multiplication Uncovered , p. 71	• Multiply by 12 or less	• Be respectful when others make mistakes • Stay involved while waiting for a turn	3–5
Multiplication Baseball , p. 77	• Multiply by 6 or less	• Be respectful when others make mistakes • Give help respectfully when asked	3–6
Multiple Moves , p. 83	• Use multiples from 2 to 5	• Be respectful when others make mistakes	3–5

GAME	MATH SKILLS	SOCIAL SKILLS	GRADES
Three Tac Toe , p. 89	<ul style="list-style-type: none"> • Find multiples • Multiply by 12 or less 	<ul style="list-style-type: none"> • Help without giving the answer 	4–6
Beach Ball Multiplier , p. 95	<ul style="list-style-type: none"> • Multiply by 11 or less 	<ul style="list-style-type: none"> • Explain one’s thinking 	4–6
Forehead Factors , p. 101	<ul style="list-style-type: none"> • Multiply or divide by 10 or less • Find factors 	<ul style="list-style-type: none"> • Be respectful when others make mistakes • Help without giving the answer 	4–6
The Leader Says Divide , p. 107	<ul style="list-style-type: none"> • Divide by 10 or less • Practice mental math 	<ul style="list-style-type: none"> • Be respectful when others make mistakes 	3–5
Spin Spot , p. 119	<ul style="list-style-type: none"> • Find factors 	<ul style="list-style-type: none"> • Help without giving the answer 	4–6
Target , p. 125	<ul style="list-style-type: none"> • Add, subtract, multiply, and divide mentally 	<ul style="list-style-type: none"> • Help without giving the answer • Give others time to think before offering help 	3–6
Disappearing Pyramid , p. 131	<ul style="list-style-type: none"> • Add, subtract, multiply, and divide mentally 	<ul style="list-style-type: none"> • Explain one’s thinking • Make decisions together 	3–6
Stadium Tour, USA , p. 137	<ul style="list-style-type: none"> • Add, subtract, multiply, and divide mentally 	<ul style="list-style-type: none"> • Give others time to think before offering help • Help without giving the answer 	3–6
Equapardy , p. 143	<ul style="list-style-type: none"> • Add, subtract, multiply, and divide 	<ul style="list-style-type: none"> • Work as a group to solve a problem 	3–6
FRACTION, DECIMAL, & PERCENT GAMES			
Flip Your Lid , p. 151	<ul style="list-style-type: none"> • Understand fractions of a group • Identify fractions and equivalent fractions 	<ul style="list-style-type: none"> • Be respectful when others make mistakes • Play safely 	3–6
Wacky Cakes , p. 157	<ul style="list-style-type: none"> • Add fractions • Find equivalent fractions 	<ul style="list-style-type: none"> • Make decisions together 	3–4
Fill ‘em Up , p. 163	<ul style="list-style-type: none"> • Understand meaning of tenths, hundredths, and one whole • Add decimals 	<ul style="list-style-type: none"> • Consider all ideas before making a decision 	5–6
Picture This! p. 169	<ul style="list-style-type: none"> • Understand meaning of percents 	<ul style="list-style-type: none"> • Stay involved while waiting for a turn 	4–6
Match Pass , p. 175	<ul style="list-style-type: none"> • Recognize equivalent fractions and percents • Add fractions and percents 	<ul style="list-style-type: none"> • Stay involved when you’ve finished and others haven’t 	5–6
Three Hexagons , p. 181	<ul style="list-style-type: none"> • Recognize equivalent fractions and percents 	<ul style="list-style-type: none"> • Help without giving the answer • Stay involved while waiting for a turn 	5–6
Stick the Fraction on the Donkey , p. 187	<ul style="list-style-type: none"> • Find fractions and percents mentally 	<ul style="list-style-type: none"> • Ask for help when needed • Play safely 	5–6

Math and Social Skills at a Glance for AfterSchool KidzMath™ Story Guides, Grades K–2

The *AfterSchool KidzMath* Story Guides help children develop number, measurement, and geometry skills and concepts. They also help children learn to make decisions, help each other, and be responsible.

This chart lists the math and social focus for each story guide activity. Use this chart to help you pick activities that are appropriate for your children.

NUMBER STORY GUIDES

BOOK TITLE	MATH SKILLS	SOCIAL SKILLS
The Doorbell Rang	Divide a group of objects equally Graph data Compare information on two graphs Compare numbers (more than, less than)	Talk in front of a group Make decisions together Explain their work Wait for a turn
Math Counts: Numbers	Recognize numbers Understand what numbers mean Identify how numbers are used	Ask for help when needed Talk in front of a group Give help respectfully when asked Share the work Be respectful of one another's work Ask questions
Mediopollito/Half-Chicken	Divide numbers or a group of objects in half Add to 12 Divide liquid in a container into two equal shares	Ask for help when needed Be respectful of one another's work Help without giving the answer Make a plan together
My Rows and Piles of Coins	Group and count by tens and ones Count large numbers of objects	Take turns Make decisions together
Ten, Nine, Eight	Find and count groups of objects to ten Count backward from ten Use strategies to play a game	Be respectful of one another's work Make decisions together Remain involved while waiting for a turn Encourage others
Under the Lemon Moon	Estimate and count quantities Add using objects Measure ingredients and record amounts	Make a plan together Share materials

MEASUREMENT STORY GUIDES

BOOK TITLE	MATH SKILLS	SOCIAL SKILLS
How Big Is a Foot?	Measure with non-standard units Compare two lengths	Make decisions together Give help respectfully when asked Work safely
Inch by Inch	Measure and compare two lengths Measure with non-standard units	Share materials Share the work Make decisions together Help one another Be respectful of one another's work

GEOMETRY STORY GUIDES

BOOK TITLE	MATH SKILLS	SOCIAL SKILLS
Grandfather Tang's Story	Explore, recognize, and describe shapes and their attributes (sides and vertices) Make shapes with other shapes Copy shapes Explore spatial relationships	Take turns Share materials Give help without giving the answer Make decisions together Share the work
Seven Blind Mice	Explore, recognize, and describe shapes and their attributes Explore spatial relationships Relate two-dimensional and three-dimensional shapes Draw an object from different perspectives (points of view)	Wait to give an answer Handle materials responsibly Be respectful of one another's work

Math and Social Skills at a Glance for AfterSchool KidzMath™ Story Guides, Grades 3–6

The *AfterSchool KidzMath* Story Guides help children develop number, measurement, and geometry skills and concepts. They also help children learn to make decisions, help each other, and be responsible.

This chart lists the math and social focuses for each story guide activity. Use this chart to help you pick activities that are appropriate for your children.

NUMBER STORY GUIDES

BOOK TITLE	MATH SKILLS	SOCIAL SKILLS
Can You Count to a Googol?	Write and read very large numbers Understand how an abacus is used Use a physical model to represent numbers	Play safely Stay involved while waiting for a turn Ask for help when needed Be respectful when others make mistakes Give help respectfully when asked
First Day in Grapes	Multiply large numbers by nine Use columns and rows Multiply, add, and subtract large and small numbers	Be respectful when others make mistakes Share the work Be patient Help one another Ask for help when needed
The King's Chessboard	Estimate, measure, and divide Create and extend geometry and number patterns Double numbers mentally Divide numbers Extend number patterns	Work safely Explain your work Be respectful of one another's work Talk in front of a group Listen to others
Marvelous Math: A Book of Poems	Understand what numbers mean Identify how numbers are used Estimate totals Add several numbers Estimate and use measurement to build something	Talk in front of a group Listen to others Work safely Be respectful of one another's work Make decisions together Share the work
Once Upon a Dime	Add amounts of money Use mental math Solve mathematical word problems	Use materials responsibly Make decisions together Give others time to think before offering help Ask for help when needed Stay involved while waiting for a turn Listen to others

MEASUREMENT AND GEOMETRY STORY GUIDES

BOOK TITLE	MATH SKILLS	SOCIAL SKILLS
Cut Down to Size at High Noon	Explore spatial relationships Explore similarity Find locations on a grid	Give help respectfully when asked Ask for help when needed Be persistent Work together as a team Stay involved while waiting for a turn
Fly High! The Story of Bessie Coleman	Measure using meters and centimeters Use spatial relationships Add meters and centimeters and convert centimeters to meters	Help each other Share the work Make decisions together Be respectful of one another's work
My Very Own Room/Mi propio cuartito	Identify and use same-size units Use a ruler Measure length, height, and width Draw to scale Use spatial relationships	Help one another Make decisions together Share the work Ask for help when needed Give help respectfully when asked
Shota and the Star Quilt	Measure length using inches Use spatial relationships Identify fractions Identify equivalent fractions Use problem-solving skills	Make decisions together Ask for help when needed Give help respectfully when asked Be respectful of one another's work Share the work
The Warlord's Puzzle	Explore, recognize, and describe shapes and their attributes (sides and vertices) Explore spatial relationships Use transformations (flip, slide, and rotate geometric shapes)	Give others time to think before offering help Be persistent Help without giving the answer Play safely Make decisions together

Correlation to National Mathematics Standards for AfterSchool KidzMath™ Games, Grades K–2

The National Council of Teachers of Mathematics (NCTM) has created a set of standards to guide the teaching of mathematics and help teachers and after-school staff understand the skills and concepts children should learn. The standard for Number and Operations is:

“Instructional programs from pre-kindergarten through grade 12 should enable all students to —

- **understand numbers, ways of representing numbers, relationships among numbers, and number systems;**
- **understand meanings of operations and how they relate to one another;**
- **compute fluently and make reasonable estimates.”**

(Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 32)

To meet this standard, the NCTM specifies expectations for children’s learning in grades K–12. The chart on the following pages lists the NCTM expectations for grades Pre-K–2 and identifies the *AfterSchool KidzMath™* games that will help children meet these expectations. Please note that this is not a comprehensive list of all the NCTM standards and expectations for these grade levels.

The *AfterSchool KidzMath™* Games also help children work toward NCTM’s Problem Solving, Reasoning and Proof, Communication, Connections, and Representation Standards.

Grades Pre-K-2
Correlation to NCTM
Number and Operations Standard

	Beat the Dice	Best Out of Three	Blast Off!	Concentrate on Ten	Countdown	Creature Catch	Dot Dazzle	Free the Fish	Funny Bug	Guess My Number
Understand numbers, ways of representing numbers, relationships among numbers, and number systems										
Expectations:										
Count with understanding and recognize “how many” in sets of objects	✓	✓	✓	✓		✓	✓	✓	✓	
Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections	✓									✓
Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connect number words and numerals to the quantities they represent using various physical models and representations.	✓	✓	✓	✓		✓	✓	✓	✓	
Understand meanings of operations and how they relate to one another										
Expectation:										
Understand the effects of adding and subtracting whole numbers	✓	✓	✓	✓	✓	✓		✓	✓	
Compute fluently and make reasonable estimates										
Expectations:										
Develop and use strategies for whole-number computations, with a focus on addition and subtraction	✓	✓	✓	✓	✓	✓		✓	✓	
Develop fluency with basic number combinations for addition and subtraction	✓	✓	✓	✓	✓	✓		✓	✓	
Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculator	✓	✓	✓	✓	✓	✓		✓	✓	✓

Grades Pre-K–2
Correlation to NCTM
Number and Operations Standard

	Hand Off	Handy Handfuls	Hop Out	Marble Mania	Musical Chairs with Numbers	Rollingo	Stack Back	Star Struck!	The Leader Says	Zero Zone
Understand numbers, ways of representing numbers, relationships among numbers, and number systems										
Expectations:										
Count with understanding and recognize “how many” in sets of objects		✓			✓	✓	✓	✓		✓
Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections	✓				✓	✓	✓			
Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connect number words and numerals to the quantities they represent using various physical models and representations.		✓				✓	✓	✓	✓	✓
Understand meanings of operations and how they relate to one another										
Expectation:										
Understand the effects of adding and subtracting whole numbers	✓		✓	✓		✓			✓	✓
Compute fluently and make reasonable estimates										
Expectations:										
Develop and use strategies for whole-number computations, with a focus on addition and subtraction	✓		✓	✓					✓	✓
Develop fluency with basic number combinations for addition and subtraction			✓	✓					✓	✓
Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculator	✓		✓	✓					✓	✓

Correlation to National Mathematics Standards for AfterSchool KidzMath™ Games, Grades 3–6

The National Council of Teachers of Mathematics (NCTM) has created a set of standards to guide the teaching of mathematics and help teachers and after-school staff understand the skills and concepts children should learn. The standard for Number and Operations is:

“Instructional programs from pre-kindergarten through grade 12 should enable all students to —

- **understand numbers, ways of representing numbers, relationships among numbers, and number systems;**
- **understand meanings of operations and how they relate to one another;**
- **compute fluently and make reasonable estimates.”**

(Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 32)

To meet this standard, the NCTM specifies expectations for children’s learning in grades K–12. The chart on the following pages lists the NCTM expectations for grades 3–5 and grades 6–8 and identifies the *AfterSchool KidzMath™* games that will help children meet these expectations. Please note that this is not a comprehensive list of all the NCTM standards and expectations for these grade levels.

The *AfterSchool KidzMath™* Games also help children work toward NCTM’s Problem Solving, Reasoning and Proof, Communication, Connections, and Representation Standards.

Grades 3–5
Correlation to NCTM
Number and Operations Standard

Understand numbers, ways of representing numbers, relationships among numbers, and number systems

	Ant Hill Picnic	Beach Ball Multiplier	Bounce Back	Disappearing Pyramid	Equapardy	Fill-em Up	Flick	Flip Your Lid	Forehead Factors	Lonely Aces
Expectations:										
Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals			✓			✓	✓			
Recognize equivalent representations for the same number and generate them by decomposing and composing numbers				✓		✓				
Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers						✓		✓		
Use models, benchmarks, and equivalent forms to judge the size of fractions										
Recognize and generate equivalent forms of commonly used fractions, decimals and percents								✓		
Explore numbers less than 0 by extending the number line through familiar applications										
Describe classes of numbers according to characteristics such as the nature of their factors										

Understand meanings of operations and how they relate to one another

Expectations:										
Understand various meanings of multiplication and division	✓			✓	✓				✓	✓
Understand the effects of multiplying and dividing whole numbers	✓	✓		✓	✓				✓	✓
Identify and use relationships between operations, such as division as the inverse of multiplication to solve problems	✓			✓					✓	
Understand and use properties of operations, such as the distributivity of multiplication over addition										

Grades 3–5
Correlation to NCTM
Number and Operations Standard

	Match Pass	Multiple Moves	Multiplication Baseball	Multiplication Basketball	Multiplication Bowling	Multiplication Uncovered	Number Detective	Picture This	Rectango	Save \$10.00
Understand numbers, ways of representing numbers, relationships among numbers, and number systems										
Expectations:										
Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals							✓	✓		
Recognize equivalent representations for the same number and generate them by decomposing and composing numbers								✓		
Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers	✓							✓		
Use models, benchmarks, and equivalent forms to judge the size of fractions	✓							✓		
Recognize and generate equivalent forms of commonly used fractions, decimals and percents	✓							✓		
Explore numbers less than 0 by extending the number line through familiar applications								✓		
Describe classes of numbers according to characteristics such as the nature of their factors								✓		
Understand meanings of operations and how they relate to one another										
Expectations:										
Understand various meanings of multiplication and division		✓		✓	✓	✓		✓	✓	
Understand the effects of multiplying and dividing whole numbers			✓	✓	✓	✓		✓	✓	
Identify and use relationships between operations, such as division as the inverse of multiplication to solve problems								✓		
Understand and use properties of operations, such as the distributivity of multiplication over addition								✓	✓	

Grades 3–5
Correlation to NCTM
Number and Operations Standard

	Spin Spot	Spinning for Dollars	Stadium Tour, USA	Stick the Fraction on the Donkey	Target	The Leader Says Divide	Three Hexagons	Three Tac Toe	Wacky Cakes	What's My Rule
Understand numbers, ways of representing numbers, relationships among numbers, and number systems										
Expectations:										
Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals		✓								✓
Recognize equivalent representations for the same number and generate them by decomposing and composing numbers		✓	✓		✓				✓	
Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers				✓			✓		✓	
Use models, benchmarks, and equivalent forms to judge the size of fractions							✓		✓	
Recognize and generate equivalent forms of commonly used fractions, decimals and percents							✓		✓	
Explore numbers less than 0 by extending the number line through familiar applications										
Describe classes of numbers according to characteristics such as the nature of their factors	✓							✓		✓
Understand meanings of operations and how they relate to one another										
Expectations:										
Understand various meanings of multiplication and division	✓		✓		✓	✓		✓		
Understand the effects of multiplying and dividing whole numbers	✓	✓	✓		✓	✓		✓		
Identify and use relationships between operations, such as division as the inverse of multiplication to solve problems	✓		✓		✓					
Understand and use properties of operations, such as the distributivity of multiplication over addition										

Grades 3–5
Correlation to NCTM
Number and Operations Standard

	Ant Hill Picnic	Beach Ball Multiplier	Bounce Back	Disappearing Pyramid	Equapardy	Fill-em Up	Flick	Flip Your Lid	Forehead Factors	Lonely Aces
Compute fluently and make reasonable estimates										
Expectations:										
Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30x50	✓	✓		✓	✓				✓	✓
Develop fluency in adding, subtracting, multiplying, and dividing whole numbers	✓	✓	✓	✓	✓		✓		✓	✓
Develop use of strategies to estimate the results of whole-number computations and to judge the reasonableness of such results									✓	
Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience						✓				
Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals						✓				
Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.	✓	✓	✓	✓	✓		✓	✓	✓	✓

Grades 3–5
Correlation to NCTM
Number and Operations Standard

	Match Pass	Multiple Moves	Multiplication Baseball	Multiplication Basketball	Multiplication Bowling	Multiplication Uncovered	Number Detective	Picture This	Rectango	Save \$10.00
Compute fluently and make reasonable estimates										
Expectations:										
Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30x50		✓	✓	✓	✓	✓		✓	✓	
Develop fluency in adding, subtracting, multiplying, and dividing whole numbers		✓	✓	✓	✓	✓		✓	✓	✓
Develop use of strategies to estimate the results of whole-number computations and to judge the reasonableness of such results								✓	✓	
Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience								✓		
Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals	✓							✓		
Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.	✓	✓	✓	✓	✓	✓		✓	✓	

Grades 3–5
Correlation to NCTM
Number and Operations Standard

	Spin Spot	Spinning for Dollars	Stadium Tour, USA	Stick the Fraction on the Donkey	Target	The Leader Says Divide	Three Hexagons	Three Tac Toe	Wacky Cakes	What's My Rule
Compute fluently and make reasonable estimates										
Expectations:										
Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30x50	✓	✓	✓		✓	✓		✓		
Develop fluency in adding, subtracting, multiplying, and dividing whole numbers	✓	✓	✓	✓	✓	✓		✓		
Develop use of strategies to estimate the results of whole-number computations and to judge the reasonableness of such results	✓									
Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience				✓		✓			✓	
Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals									✓	
Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.		✓		✓						✓

Grades 6–8
Correlation to NCTM
Number and Operations Standard

	Fill 'Em Up	Flip Your Lid	Forehead Factors	Match Pass	Multiple Moves	Picture This	Spin Spot	Stick the Fraction on the Donkey	Three Hexagons	Three Tac Toe	Wacky Cakes
Understand numbers, ways of representing numbers, relationships among numbers, and number systems											
Expectations:											
Work flexibly with fractions, decimals, and percents to solve problems.	✓	✓		✓		✓		✓	✓		✓
Develop meaning for percents greater than 100 and less than 1				✓		✓		✓	✓		
Use factors, multiples, prime factorization, and relatively prime numbers to solve problems*†			✓		✓		✓			✓	
Understand meanings of operations and how they relate to one another											
Expectations:											
Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers	✓					✓		✓			✓

**AfterSchool KidzMath™* covers only factors and multiples.

†All the other multiplication and division games also help children with factors and multiples, but less directly.

Correlation to National Mathematics Standards for AfterSchool KidzMath™ Guides, Grades K–2

The National Council of Teachers of Mathematics (NCTM) has created a set of standards to guide the teaching of mathematics and help teachers and after-school staff understand the skills and concepts children need to learn. The standards for Number and Operations, Measurement, and Geometry are shown below:

NCTM Number and Operations Standard

Instructional programs from prekindergarten through grade 12 should enable all students to—

- understand numbers, ways of representing numbers, relationships among numbers, and number systems;
- understand meanings of operations and how they relate to one another;
- compute fluently and make reasonable estimates.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 32

NCTM Measurement Standard

Instructional programs from prekindergarten through grade 12 should enable all students to—

- understand measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools, and formulas to determine measurements.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 44

NCTM Geometry Standard

Instructional programs from prekindergarten through grade 12 should enable all students to—

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations;
- use visualization, spatial reasoning, and geometric modeling to solve problems.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 41

To meet these standards, NCTM specifies several expectations for children's learning. The following correlation chart lists some of these expectations for grades pre-K–2 and identifies the *AfterSchool KidzMath* Story Guides that will help the children meet these expectations. Not all the NCTM expectations are listed, only those covered in the guides.

AfterSchool KidzMath Story Guides also help children work toward NCTM's Problem Solving, Reasoning and Proof, Communications, Connections, and Representation Standards.

Grades pre-K–2

Correlation to NCTM

Number and Operations Standard

	The Doorbell Rang	Math Counts: Numbers	Mediopollito/Half-Chicken	My Rows and Piles of Coins	Ten, Nine, Eight	Under the Lemon Moon
Understand numbers, ways of representing numbers, relationships among numbers, and number systems						
Expectations:						
Count with understanding and recognize “how many” in sets of objects	✓	✓	✓	✓	✓	✓
Use multiple models to develop initial understandings of place value and the base ten number system				✓		
Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and connections						✓
Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers	✓	✓	✓	✓	✓	✓
Connect number words and numerals to the quantities they represent using physical models and representations	✓	✓	✓	✓	✓	✓
Understand and represent commonly used fractions, such as $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$	✓		✓			✓
Understand meanings of operations and how they relate to one another						
Expectations:						
Understand the effects of adding and subtracting whole numbers			✓			✓
Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally	✓		✓			
Compute fluently and make reasonable estimates						
Expectations:						
Develop and use strategies for whole-number computations, with a focus on addition and subtraction			✓			✓
Develop fluency with basic number combinations for addition and subtraction			✓			✓
Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculator	✓	✓	✓	✓	✓	✓

Grades K–2

**Correlation to NCTM
Measurement Standard**

Understand measurable attributes of objects and the units, systems, and processes of measurement about geometric relationships

Expectations:

Recognize the attributes of length, volume, weight, area, and time

How Big
Is a Foot?

Inch by Inch



Compare and order objects according to these attributes



Understand how to measure using non-standard units and standard units



Apply appropriate techniques, tools, and formulas to determine measurements

Expectations:

Measure with multiple copies of units of the same size, such as paper clips laid end to end



**Correlation to NCTM
Geometry Standard**

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

Expectations:

Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes

Grandfather
Tang's Story

Seven Blind
Mice



Describe attributes and parts of two- and three-dimensional shapes



Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes



Use visualization, spatial reasoning, and geometric modeling to solve problems

Expectations:

Create mental images of geometric shapes using spatial memory and spatial visualization



Recognize and represent shapes from different perspectives



Recognize geometric shapes and structures in the environment and specify their location



Correlation to National Mathematics Standards for AfterSchool KidzMath™ Guides, Grades 3–6

The National Council of Teachers of Mathematics (NCTM) has created a set of standards to guide the teaching of mathematics and help teachers and after-school staff understand the skills and concepts children need to learn. The standards for Number and Operations, Measurement, and Geometry are shown below:

NCTM Number and Operations Standard

Instructional programs from prekindergarten through grade 12 should enable all students to—

- understand numbers, ways of representing numbers, relationships among numbers, and number systems;
- understand meanings of operations and how they relate to one another;
- compute fluently and make reasonable estimates.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 32

NCTM Measurement Standard

Instructional programs from prekindergarten through grade 12 should enable all students to—

- understand measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools, and formulas to determine measurements.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 44

NCTM Geometry Standard

Instructional programs from prekindergarten through grade 12 should enable all students to—

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations;
- use visualization, spatial reasoning, and geometric modeling to solve problems.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics, 2000, p. 41

To meet these standards, NCTM specifies several expectations for children's learning. The following correlation chart lists some of these expectations for grades 3–5 and grades 6–8 and identifies the *AfterSchool KidzMath* Story Guides that will help the children meet these expectations. Not all the NCTM expectations are listed, only those covered in the guides.

AfterSchool KidzMath Story Guides also help children work toward NCTM's Problem Solving, Reasoning and Proof, Communications, Connections, and Representation Standards.

Grades 3–5

Correlation to NCTM Number and Operations Standard

	Can You Count to a Googol?	First Day in Grapes	The King's Chessboard	Marvelous Math	Once Upon a Dime	Shota and the Star Quilt
Understand numbers, ways of representing numbers, relationships among numbers, and number systems						
Expectations:						
Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals	✓		✓	✓	✓	
Recognize equivalent representations for the same number and generate them by decomposing and composing numbers		✓			✓	
Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers			✓	✓	✓	✓
Use models, benchmarks, and equivalent forms to judge the size of fractions						✓
Recognize and generate equivalent forms of commonly used fractions, decimals and percents						✓
Understand meanings of operations and how they relate to one another						
Expectations:						
Understand various meanings of multiplication and division		✓	✓	✓	✓	
Understand the effects of multiplying and dividing whole numbers		✓	✓	✓	✓	
Compute fluently and make reasonable estimates						
Expectations:						
Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30×50		✓	✓		✓	
Develop fluency in adding, subtracting, multiplying, and dividing whole numbers		✓	✓	✓	✓	✓
Develop use of strategies to estimate the results of whole-number computations and to judge the reasonableness of such results			✓	✓	✓	
Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience			✓			✓
Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool		✓	✓	✓	✓	✓

Grades 3–5

Correlation to NCTM Measurement Standard

	Fly High!	The King's Chessboard	Marvelous Math	My Very Own Room	Shota and the Star Quilt
Understand measurable attributes of objects and the units, systems, and processes of measurement					
Expectations:					
Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute	✓	✓	✓	✓	✓
Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems	✓	✓	✓	✓	✓
Carry out simple unit conversions, such as from centimeters to meters, within a system of measurement	✓				
Understand that measurements are approximations and understand how differences in units affect precision	✓	✓		✓	✓
Apply appropriate techniques, tools, and formulas to determine measurements					
Expectations:					
Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles	✓		✓	✓	✓
Select and use benchmarks to estimate measurements		✓	✓	✓	
Develop strategies to determine the surface areas and volumes of rectangular solids			✓	✓	

Additional Reading and Research

Mathematics

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*The School-Age Notes Catalog is also an excellent resource for books on school-age care. See their website at: <http://www.schoolagenotes.com>

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