Math Perspectives
Catalog
Table of Contents

About Math Perspectives
- Our Mission ..................................................1
- About Kathy Richardson ...............................1

Common Core Standards for Mathematics
- Math Perspectives and the Common Core Standards ...........2
- Understanding the Common Core Standards for Mathematics ....2

Professional Development Courses
- Assessing Math Concepts (AMC) Institute ........3
- Assessing Math Concepts (AMC) 
  Grade Level Courses .........................................3
- Teaching for Understanding ................................3
- Developing Number Concepts ..........................3
- Thinking with Numbers: Number Talks ...............4
- Understanding Numbers: 
  Developing Computational Fluency .....................4
- Developing Math Concepts in Pre-K ..................4
- Understanding Fractions Course ......................4

General Information
For All Courses & Institutes
- Costs ..................................................................5
- Course Hours ..................................................5
- Professional Development Facility/Materials ..........5
- Texts and Materials ........................................5
- Additional Information ....................................5

Assessing Math Concepts
- Assessing Math Concepts ................................6
- AMC Anywhere ..............................................7

Books, DVDs and Professional Resources
- Developing Number Concepts ............................8
- Developing Number Concepts 
  Independent Station Cards/Activity Cards ........9
- Dice Kits for Developing Number Concepts .........9
- Understanding Geometry .................................10
- Math Time: The Learning Environment ..............10

Professional Development DVDs
- Math Time DVD Set .........................................10
- The Learning Environment for K-2 Mathematics, 
  What Does it Look Like? .................................11
- Making Math Time Work in the Classroom .......11
- Thinking With Numbers: Number Talks ...........11
- A Look at Children’s Thinking .........................11

Pre-Kindergarten
- Developing Math Concepts 
  in Pre-Kindergarten .......................................12
- Pre-Kindergarten Student Interview Forms ..........13
  - Changing Numbers Form .............................13
  - Counting Form ..........................................13
  - Number Arrangements Form ........................13

Understanding Numbers
- Decimals .......................................................14
- Addition & Subtraction ...................................14
- Place Value ..................................................14

Critical Learning Phases
- How Children Learn Number Concepts: 
  A Guide to the Critical Learning Phases ...............15

Testimonials .......................................................16

Contact Information ...........................................16
About Math Perspectives

Math Perspectives professional development helps schools and school districts become on-going learning organizations that directly and ultimately benefit students. We work with schools and districts to organize for the effective teaching and learning of mathematics and enhance their understanding of:

- Important mathematical concepts
- How children learn and develop mathematical thinking
- How to assess mathematical understanding and competence and to teach in response to children’s needs
- Techniques for implementing an exemplary math program
- Ways to organize a classroom in order to ensure the success of all students

Our Mission

To be sure our students are ready to meet the challenges of the future, the mission of Math Perspectives Teacher Development Center is to provide Pre-K to 5th grade mathematics educators with tools, strategies, and assessments that will ensure that all students are successful in the study of mathematics and are able to use mathematics to solve problems and to think and reason mathematically.

Planning for Success

Math Perspectives will work closely with you to identify your school/district’s professional development needs. Based on those needs, we will work with you to develop a personalized plan.

Options

- Long-term, systemic, professional development plans
- Summer and school-year courses and institutes
- Summer Leadership Institute for K-5 teacher leaders and administrators
- School-year introductory sessions to introduce your school district to the philosophy and approach of standards-based mathematics instruction
- Administrator sessions

About Kathy Richardson

One of the nation’s leading educators of elementary mathematics, Kathy has spent over 30 years working with elementary school students, teaching classroom educators and developing assessment and curriculum materials. Kathy is the Program Director for Math Perspectives.
Mission Statement of the Common Core Standards

The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy. ~ Common Core State Standards Initiative

Math Perspectives and the Common Core Standards

The release of the Common Core State Standards for Mathematics (CCSSM) in June 2010 is part of the continuing national goal to ensure mathematically proficient students. At Math Perspectives, we are continuing to study the Common Core Standards for Mathematics and have found they are based on much of the same research as our resources and we share similar visions. Before the Common Core Standards were being written, Kathy Richardson and the entire Math Perspectives team have been focused on helping teachers understand the mathematics they teach and how students learn and develop mathematical thinking. Kathy Richardson has developed assessments that allow teachers to know exactly where their students are in their mathematical development and understanding. These assessments are both formative and diagnostic. Her curriculum materials have been developed to help young children make sense of number concepts.

A correlation of Math Perspectives materials and the Common Core Standards can be found at www.mathperspectives.com.

Understanding the Common Core Standards for Mathematics

Introduction

Toward greater focus and coherence

Mathematics experiences in early childhood settings should concentrate on (1) number (which includes whole number, operations, and relations) and (2) geometry, spatial relations, and measurement, with more mathematics learning time devoted to number than to other topics. Mathematical process goals should be integrated in these content areas.

— Mathematics Learning in Early Childhood National Research Council, 2009

Announced on June 1, 2009, the Common Core State Standards Initiative provides teachers and parents with a common understanding of what students are expected to learn. It is believed that consistent standards will provide appropriate benchmarks for all students, regardless of where they live.
Professional Development Courses
Math Perspectives Teacher Development Center offers a wide range of professional development courses and institutes to provide teachers with a knowledge base that allows them to continuously improve the teaching and learning of mathematics in their classrooms. These courses include mathematical content with an emphasis on essential understandings, information on how children learn mathematics, and practical classroom activities and experiences that support children’s development of mathematical competence.

Assessing Math Concepts (AMC) Institute
**Grade Level: K-3**
**Duration: 5 days**
The Math Perspectives Assessing Math Concepts (AMC) Institute is designed for teacher educators, math coaches, math coordinators, teacher-leaders, professional developers, and other educators who support professional development of kindergarten through third grade teachers of mathematics. AMC is an in-depth study of how children learn number concepts. Participants spend the week immersed in looking at children’s thinking and learning to identify students’ instructional needs.

Assessing Math Concepts (AMC) Grade Level Courses
**Grade Level: K, 1 and 2**
**Duration: 3 days each**
Despite the adopted district curriculum or assessments used, children do not all learn at the same pace. As a result, teachers need to determine what their students still need to learn in order to provide optimal and appropriate experiences for them. During these three-day courses, participants will learn to use grade-level appropriate assessments from the Assessing Math Concepts series to identify the instructional needs of their students. They will also learn to use the information gained from the assessments to focus their instruction and maximize student learning using teaching strategies from the Developing Number Concepts series by Kathy Richardson.

The texts for these courses are the Developing Number Concepts books by Kathy Richardson.

Kindergarten — Books 1 and 2
1st grade — Books 2 and 3
2nd grade — Books 2 and 3

Additional texts include Assessing Math Concepts books appropriate for each grade level:

- Kindergarten — “Counting Objects”, “Changing Numbers”, and “Number Arrangements”
- 1st Grade — “Number Arrangements”, “Combination Trains”, “Ten Frames”, and “Hiding Assessment”
- 2nd Grade — “Hiding Assessment”, “Ten Frames”, “Grouping Tens”, and “Two-Digit Addition & Subtraction”

Teaching for Understanding
**Grade Level: K-2/3-5**
**Duration: 5 days**
These five-day courses focus on how to actively engage students in mathematics in ways that take them beyond procedures to deep understanding of basic math concepts. Attention is given to creating a learning environment that allows teachers to identify the

Developing Number Concepts
**Grade Level: K-2**
**Duration: 3 days**
This course focuses K-2 teachers on ways to help children develop understanding and competence with counting, number relationships, addition, subtraction, and place value. Participants learn how to engage children in meaningful activities that provide appropriate practice and ensure that children have the foundation they need for future success. Participants learn how to create a positive learning environment in their classrooms along with practical methods for providing activities and materials that meet the range of needs in their classrooms.

Host groups also need to purchase the Developing Number Concepts book by Kathy Richardson for each participant.

Recommended Books -
- Kindergarten — Books 1 and 2
- 1st grade — Books 2 and 3
- 2nd grade — Books 2 and 3
**Thinking with Numbers: Number Talks**  
**Grade Level:** K-2/3-5  
**Duration:** 3 days  
During these three-day courses, teachers learn to help students acquire competence in computation using visual models and number relationships to build number sense and to develop numerically powerful strategies that make sense to students. Students work with numbers using strategies that are simple, yet meaningful and powerful. Teachers see these methods modeled as they observe children solving problems during Number Talks. Course time is also devoted to helping teachers strengthen their own understanding of mathematics.

**Developing Math Concepts in the Pre-K**  
**Grade Level:** Pre-K  
**Duration:** 2 days  
This two-day course focuses Pre-K teachers on how to create a positive environment that supports the learning of mathematics. They will gain knowledge of how mathematical ideas in a Pre-K environment are investigated through play, active participation, and intentional learning tasks and will learn to utilize questioning techniques to promote mathematical thinking. Participants will learn to provide appropriate experiences that encourage mathematical development and understanding and allow them to differentiate instruction to meet the range of needs in their classroom. The text for this course is *Developing Math Concepts in Pre-Kindergarten* by Kathy Richardson.

**Understanding Numbers: Developing Computational Fluency**  
**Grade Level:** 3-5  
**Duration:** 3 days  
This 3-day course presents grades 3-5 teachers with methods and activities that will help their students develop an understanding of the structure of numbers as the basis for computational fluency. Topics include place value, multi-digit addition and subtraction, multiplication and division and a first look at decimals.

Texts for this course are the *Understanding Numbers* set of books and stations by Kathy Richardson.

**Understanding Fractions Course**  
**Grade Level:** 3-5  
**Duration:** 3 days  
In this course, teachers will learn to present key fraction concepts in ways that help students build deep understandings of the fundamental relationships, language, and symbolism of fractions, decimals and percent. Participants will engage in activities that promote sensible computation with all four operations.
General Information for all Courses and Institutes

The Common Core Standards for Mathematics establish what students need to learn. However, they do not dictate how teachers should teach. Districts, schools and teachers will decide how to best help their students meet the standards and Math Perspectives is ready to support them as they make sound instructional decisions to transition to the CCSM by providing them with the professional development they need.

Costs

The cost for our courses and professional development services vary depending on many factors including the number of days and the number of participants. Please contact us to discuss your goals. We will work in collaboration with you to create the most cost-effective plan for your organization.

Math Perspectives Instructors and Education Specialists are highly qualified teachers with years of classroom and leadership experience. They use our teaching strategies in their own classrooms and are prepared to address the challenges teachers have when making changes to improve mathematics instruction. They have extensive experience in professional development settings in their own school as well as nationwide.

Course Hours

Course hours are from 8:30 a.m. to 3:30 p.m. each day including a one-hour lunch break.

Professional Development Facility/Materials

Each of the professional development sessions will be held in facilities provided by the School District such as a conference room in a District or Regional Office, empty classroom or library in an elementary school. Math Perspectives staff will work closely with the District to determine the requirements of the facility. Math Perspectives will ship all materials to be modeled or used during each course, in advance, to the course site or other address provided by the District’s staff. Math Perspectives will issue Call Tags for United Parcel Service (UPS) to pick up non-consumable materials for return back to Math Perspectives.

Texts and Materials

Should a participant wish to purchase their own texts and materials for use outside of the course, they may do so through our distributor:

Write: Didax, Inc.
395 Main Street
Rowley, MA 01969
Phone: (800) 458-0024
Internet: www.didax.com

Additional Information

Participants in most Math Perspectives courses will receive the Math Perspectives Professional Development Reference & Reading Materials for Teachers of K-5 Mathematics.

Research:

Math Perspectives professional development, teaching strategies, instructional materials and assessments are based on the latest scientific research.

For information on current research, please visit our website at www.mathperspectives.com/research.html.

Assessing Math Concepts/Developing Number Concept Facilitator/Specialist Program

This program prepares teacher leaders to present Assessing Math Concepts and/or Developing Number Concepts professional development courses in their own district at a reduced cost. Contact us for details.
Assessing Math Concepts (AMC) is a continuum of assessments that are both formative and diagnostic that, along with professional development, deepen teachers’ understanding of the Critical Learning Phases and their understanding of the mathematics they teach. The assessment information gathered and organized helps strengthen the teacher's awareness of the important steps in the learning process and provides information for instructional decision-making.

Assessing Math Concepts
9 Part Assessment Series
by Kathy Richardson

Each book provides the teacher background information for giving and using the assessment tasks, instructions for doing classroom observations, tips for organizing information and suggestions for instruction. Black line masters are included and can be reproduced for classroom assessment activities.

9 Part Assessment Series | Grades: K-3
- **Counting Objects**, Item No: 2-180Z
- **Changing Numbers**, Item No: 2-181Z
- **More/Less Train**, Item No: 2-182Z
- **Number Arrangements**, Item No: 2-183Z
- **Combinations Trains**, Item No: 2-184Z
- **Hiding Assessment**, Item No: 2-185Z
- **Ten Frames**, Item No: 2-186Z
- **Grouping Tens**, Item No: 2-187Z
- **Two-Digit Addition and Subtraction**, Item No: 2-188Z
- **Complete Set of all 9 Assessing Math Concepts**, Item No: 2-1800Z

AMC Anywhere makes implementing Assessing Math Concepts easier and more efficient. The program simplifies data collection and automatically summarizes results.

Using our new, Web-based version, teachers enter student responses directly into any computer (PC or Mac) with Internet access. Clear, on-screen prompts, in English and Spanish, ensure teachers accurately reflect students’ understanding. Assessments are carried out more efficiently, without the need for Student Interview forms. When teachers have finished assessing, they have immediate access to powerful, web-based reporting.
**Powerful Web-Based Reports**

AMC Anywhere offers administrators and teachers a variety of reports that summarize student results and enable teachers to make instructional decisions. For administrators, reporting shows the use of assessments throughout the school or district. Benchmark reports provide a comprehensive summary and allow for tracking results over time. For teachers, AMC Anywhere captures every answer in each assessment for complete individual student reports. Class reporting also summarizes results and provides reports for grouping instruction.

**Use Assessment to Inform Instruction**

In each AMC book, teachers are provided with instructional guidelines for each student based on their results. In addition, specific activities from the *Developing Number Concepts* series by Kathy Richardson are recommended for targeted instruction.
Books, DVDs and Professional Resources
Math Perspectives offers a wide range of publications and resource materials for teaching professionals. The following pages provide a detailed overview of these core resources.

Developing Number Concepts
3 Part Series and Guide
by Kathy Richardson
Grades: K-3

These books present a complete number curriculum for kindergarten through third grade classrooms. They are clearly written and each book provides simple but meaningful activities which give students repeated math experiences. These books present an approach based on years of research by the author on how children learn. They are a must for K-3 teachers of mathematics aspiring to meet the needs of all their students.

Each chapter of each book includes:

- What you need to know about…
- Chapter Overview
- Goals for Children’s Learning
- Analyzing and Assessing Children’s Needs
- Classroom Scenes
- About the Activities
- Teacher Directed Activities
- Independent Activities
- Blackline Masters

Book 1: Counting, Comparing, and Pattern, Item No: 9-00584Z
Book 2: Addition and Subtraction, Item No: 9-00592Z
Book 3: Place Value, Multiplication, and Division, Item No: 9-00606Z

Planning Guides: The Planning Guides includes comprehensive year-long teaching plans along with classroom management ideas. Item No: 9-59244Z
Developing Number Concepts
Independent Station Cards/Activity Cards

These activity cards for Developing Number Concepts are reproduced in class quantities on heavy colored card stock and sorted by category. Zip lock bags help keep everything organized. Each set also includes an Independent Station Card for each activity. These cards organize the “Independent Activities” and make it easier for students to work independently, freeing the teacher to observe, challenge and assess students as they work with the activities. Includes instructions.

Activity Card Set 1
Available in Laminated or Unlaminated Card Stock
For use with Book 1: Counting, Comparing and Pattern, 619 activity cards
Laminated, Item No: 211171Z
Unlaminated Cardstock, Item No: 2-151Z

Activity Card Set 2
Available in Laminated or Unlaminated Card Stock
For use with Book 2: Addition and Subtraction 427 activity cards
Laminated, Item No: 211172Z
Unlaminated Cardstock, Item No: 2-152Z

Activity Card Set 3
Available in Laminated or Unlaminated Card Stock
For use with Book 3: Place Value, Multiplication and Division 311 activity cards
Laminated, Item No: 211173Z
Unlaminated Cardstock, Item No: 2-153Z

Dice Kits for Developing Number Concepts

The following dice kits are available to support the activities in Developing Number Concepts. Dice are 3/4” for easy handling.

Dice Kit 1, Item No: 210936Z
Kit 1 Includes 50 each of the following:
• Dot Dice 0-5
• Dot Dice 1-6
• Dot Dice 4-9
• Number Dice 0-5
• Number Dice 1-6
• Number Dice 4-9

Dice Kit 2, Item No: 210937Z
Kit 2 Includes 50 each of the following:
• Number Dice 0-4 (two 4’s)
• Number Dice 0-5
• Number Dice 1-6
• Number Dice 4-9
• +/- Dice

Dice Kit 3, Item No: 210938Z
Kit 3 Includes 50 each of the following:
• Number Dice 1-6
• Number Dice 4-9
• Tens Dice
**Understanding Geometry**  
A Complete K—3 Resource for Geometry  
by Kathy Richardson  
**Grades: K-3**

This valuable resource book provides teachers with ongoing experiences for helping children develop spatial awareness and an in-depth understanding of two- and three-dimensional geometry concepts. More than just activities, the book provides guidelines for deepening children’s understanding and observing their growth. Includes the “big ideas” in geometry, glossary, planning guide, task cards, assessments, and observations. Uses a variety of common manipulatives. 158 pages.

**Understanding Geometry**, Item No: 2-141Z

**Math Time**  
The Learning Environment  
by Kathy Richardson  
**Grades: K-2**

This book is a must for every primary teacher! It is a unique guide that provides practical solutions to everyday classroom situations. The book addresses many timely topics such as teaching for understanding, ongoing assessment, and planning for concept development. It guides teachers through important decisions about the classroom environment.

**Math Time**, Item No: 100-1001Z

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**Math Perspectives DVD Set**  
by Kathy Richardson  
**4 DVD Set | Grades: K-2**

Catalog #211274Z.

These videos feature real classrooms with teachers helping students think and learn about math. Included on each DVD is a guide with instructions for the facilitator and handouts for teachers. They are an ideal companion to support Kathy Richardson’s *Developing Number Concepts* curriculum resources. Included in the set are:

- The Learning Environment for K-2 Mathematics, What Does it Look Like?
- Making Math Time Work in Your Classroom
- Thinking With Numbers: Number Talks
- A Look at Children’s Thinking

Read the following individual details for more information on each of the DVDs in this set.
The Learning Environment for K-2 Mathematics…
What Does it Look Like? DVD provides teaching professionals, administrators, and parents with a vision of what the learning environment should look like when teaching mathematics for understanding and concept development in the K-2 classroom.

Visit real classrooms where teachers are doing real work with children. You will get a close-up look at children thinking, looking for relationships, explaining, and working hard in a setting that encourages their active involvement. You will see a dynamic and supportive learning environment that helps children be successful in mathematics.

Catalog #211251Z

Making Math Time Work in Your Classroom is designed to show K-2 teachers how to create and orchestrate a learning environment where students develop mathematical understanding and learn to love math. From the room arrangement, to the simple materials, to managing an effective ‘math time,’ where all students are confidently engaged at their own level, the viewers learn how to ‘make it all happen’ right in their own classrooms!

Catalog #211253Z

Thinking With Numbers: Number Talks DVD shows children doing arithmetic in a way that makes sense to them, using strategies that are simple yet meaningful and powerful. Thinking with Numbers features classroom teachers and students engaged in mental math sessions that foster children’s understanding of number concepts. This unique approach enables teachers to find out what children are thinking and doing when they add, subtract, multiply, and divide.

This DVD demonstrates real students in real classrooms, typical of most students in this country. Yet not one of them says, “I can’t do this problem.” They all try, and they all find a way to solve the problems they are given. Why? Because they have been taught to do math in a way that makes sense to them.

Catalog #211252Z

A Look at Children’s Thinking examines varying development levels of children’s thinking while providing a model for assessment techniques and for assessing children while they work. The videos help teachers focus on how children think and what they understand so they can provide experiences that help children develop their ability to make sense of number concepts.

Excellent for inservice programs, college classes or individual study.

Catalog #211254Z
Pre-Kindergarten Books and Student Interview Forms

Math Perspectives has developed a range of publications and resource materials for providing teachers with everything they need to understand about teaching math in the Pre-Kindergarten classroom.

Developing Math Concepts in Pre-Kindergarten
by Kathy Richardson

Grades: Pre-Kindergarten

For the first time in a single resource, Kathy Richardson shares her insights into the mathematical development of preschool students. Based on the most current research about the development of young children, and closely aligned with NCTM standards, this book provides teachers with everything they need to understand about teaching math in the Pre-Kindergarten classroom. The book is organized by the key mathematical areas children “Need to Know”:

- Numbers
- Geometry
- Sorting and Classifying
- Pattern
- Measurement
- Data Collection

In addition to outlining the standards, “Big Ideas” are presented making it clear to teachers what the appropriate expectations are for Pre-K students. For each of these areas, activities are provided for circle time, small group, and individual instruction. In all, over 75 activities are included making this a complete resource for all Pre-Kindergarten teachers.

Developing Math Concepts, Item No: 123892Z
**Pre-Kindergarten Student Interview Forms**

*Student Interview Forms to Accompany Developing Math Concepts in Pre-Kindergarten*

by Kathy Richardson

Three unique Student Interview Forms designed exclusively to accompany the *Developing Math Concepts in Pre-Kindergarten* book. Each assessment form focuses on one core topic; Changing Numbers, Counting and Number Arrangements.
Understanding Numbers
Math Stations for Grades 3—5
by Kathy Richardson

This series provides students with the meaningful practice necessary to develop an understanding of the underlying structure of numbers, number relationships, and operations. The mathematical concepts presented in the stations are foundational to developing computational fluency and to understanding the mathematics students will encounter in the later years.

Each book consists of eight stations that present a variety of activities focused on one major concept. The tasks are designed to meet a range of needs, allowing all students to work at their own level. These stations should be experienced over and over again until students have developed proficiency in the tasks. Most students will benefit from working with the appropriate set of stations for several weeks. Each book includes complete instructions for implementing the activities, including differentiation ideas. Bundled with the book are the Activity Cards needed for each activity, printed on colored stock and suitable for repeated classroom use.

Decimals
Item No: 2-192Z
The eight stations in this set give students experiences that help them deepen their understanding of the structure and relative value of decimal numbers. The focus is on wholes, tenths, and hundredths with some extensions to thousandths. Through ongoing work at the stations, students will learn to recognize the structure of numbers as hundredths, tenths, and wholes, and will learn to combine and compare decimal fractions.

Addition & Subtraction
Item No: 2-193Z
The goal of the eight stations in this set is the development of computational fluency with multi-digit numbers. The tasks focus the students on using the underlying structure of numbers to combine, break apart, and compare numbers. They learn to combine quantities by reorganizing them into the largest groups possible and to subtract by breaking numbers apart and recombining what’s left. They also learn to find the difference between numbers using a variety of strategies. Models are used to help them understand what is happening to the numbers and to progress to where they can do the operations without models. Each task requires them to explain their strategies using words, drawings, and/or symbols.

Place Value
Item No: 2-191Z
The eight tasks in this set give students a variety of experiences that help them think of numbers in terms of their underlying structure. The focus is on 100s, 10s, and 1s, with variations that focus on smaller numbers (10s and 1s) or larger numbers (1000s 100s 10s and 1s.) Each of the tasks requires the students to reorganize various groups of 100s, 10s, and 1s when combining and comparing quantities. Working with the numbers in this way focuses them on the structure of the numbers and helps them recognize the equivalent values inherent in the base-ten number system.
New from Kathy Richardson

A “must-have” book for every educator wanting to know how young children develop an understanding of number concepts. Through her years of research and extensive work with young children, Kathy Richardson has identified the stages, or Critical Learning Phases, children go through as they develop mathematical understanding. This resource will help all math educators understand how children make sense of numbers and what mathematics they are ready to learn at each phase of development.

How Children Learn Number Concepts
A Guide to the Critical Learning Phases
by Kathy Richardson

“How do we help children develop the foundation necessary for future mathematical success? With clarity and eloquence, Kathy Richardson answers this question by illuminating the complexity of the intellectual work young children must do in order to build a robust sense of number. She identifies critical phases in the development of understandings in core topics such as counting and place value, providing examples that bring to life their importance for future mathematics learning. At a time when policy makers expect children to learn mathematics concepts and skills at earlier and earlier ages, this book should give teachers the courage to spend the time necessary for children to develop numerical understandings strong enough to provide a solid foundation for, rather than illusions of, learning.”

Cathy Humphreys, Doctoral Student, Stanford University
Co-author of Connecting Mathematical Ideas with Jo Boaler and
A Collection of Math Lessons, Grades 6-8 with Marilyn Burns

“This book might well become essential reading for any teacher desiring to understand a child’s developing sense of number. Richardson has taken complex ideas about number development and translated those ideas for teachers using practical, common sense terms in detailed description. Since Common Core was first published we have heard talk of progressions, trajectories and learning continua, often hard to translate for practical implementation by teachers. But Richardson transforms the complexity by introducing ‘Critical Learning Phases’; obviously gleaned from observed behaviors of many children. In this easy to decipher text she offers teachers a treasure trove of ideas to help alleviate the confusion many teachers feel about teaching math.”

Hal Melnick, PhD, Bank Street College of Education NYC
Graduate Faculty
Leadership in Mathematics Education

Item No: 211348Z
Testimonials

“I have been so happy with the learning (teachers’ and students’) that has come about because of our use of AMC. We have used the data from our assessments to inform instruction and teachers LOVE the Developing Number Concepts books and activities. When I’m looking into Common Core Standards, I feel like our K-2 teachers are especially well prepared for the emphasis on numeracy development.”

Rebecca Campos
District Elementary Mathematics Coach
Moriarty-Edgewood Schools

“Thank you for bringing math assessment into the 21st century! With your updated AMC Anywhere, assessment and specific, appropriate intervention are just mouse-clicks away. Bravo!”

Chris Mosner
District Math Coach
Todd County School District

“Kathy Richardson is a true scientist. She has committed her life to studying how children learn mathematics and to sharing this knowledge with others. Kathy’s work is transforming mathematics instruction throughout our district. The Developing Number Concepts books and Assessing Math Concepts assessments provide practical tools to help primary teachers bring best practices to life in their classrooms.”

Sue Chapman, Ed. D.
Instructional Supervisor
McWhirter Professional Development Laboratory School
Clear Creek Independent School District