knowing and teaching elementary mathematics

Knowing and Teaching Elementary Mathematics: Building Strong Foundations for Lifelong Learning

knowing and teaching elementary mathematics is more than just understanding numbers and equations; it’s about nurturing a child’s ability to think critically, solve problems, and see the world through a logical lens. Elementary math forms the cornerstone of future learning in science, technology, engineering, and everyday life. Whether you are a parent, teacher, or tutor, grasping the essentials of this subject and knowing how to effectively teach it can profoundly impact a child’s academic journey and confidence in handling numbers.

Why Knowing and Teaching Elementary Mathematics Matters

Elementary mathematics introduces young learners to fundamental concepts such as addition, subtraction, multiplication, division, basic geometry, and measurement. These building blocks are crucial because they set the stage for more complex math topics later on. But beyond the curriculum, understanding elementary math helps children develop essential cognitive skills.

Children who receive a strong foundation in mathematics tend to perform better across various subjects, not just math. This is because math encourages logical thinking, pattern recognition, and problem-solving abilities—skills that are transferable to reading comprehension, science experiments, and even social studies.

Developing a Mathematical Mindset

One of the most important aspects of knowing and teaching elementary mathematics is fostering a positive mathematical mindset. Many students develop math anxiety early on, often due to negative experiences or a lack of confidence. Teachers and parents can counter this by creating a supportive environment where mistakes are seen as learning opportunities rather than failures.

Encouraging questions, celebrating small victories, and relating math to everyday life can help children view math as an exciting challenge instead of a daunting task. When kids feel comfortable and motivated, they engage more deeply, which enhances their understanding and retention.

Effective Strategies for Teaching Elementary Mathematics

Teaching math to young learners requires creativity, patience, and a mix of approaches tailored to different learning styles. Here are some proven methods to make elementary math engaging and accessible.

Use Concrete Manipulatives

Hands-on tools such as blocks, counters, and beads allow children to visualize abstract concepts. For example, using physical objects to demonstrate addition or subtraction makes the process tangible. Manipulatives bridge the gap between concrete experiences and symbolic math, helping students internalize concepts more effectively.

Incorporate Storytelling and Real-Life Contexts

Math doesn’t have to be confined to worksheets. Integrating stories or practical examples can make lessons more relatable. For instance, framing a math problem around shopping, cooking, or sharing treats helps children understand the relevance of math in daily life.

Utilize Visual Aids and Technology

Visual aids like charts, diagrams, and colorful illustrations cater to visual learners and clarify complex ideas. Additionally, educational technology—such as interactive apps and games—offers personalized learning experiences that adapt to a student’s pace and skill level, making math practice fun and effective.

Encourage Collaborative Learning

Group activities and peer discussions promote communication and deepen understanding. When children explain their reasoning to others, they reinforce their knowledge and develop critical thinking skills. Collaborative tasks also build social skills, making math a shared adventure rather than a solitary challenge.

Key Concepts to Emphasize in Elementary Mathematics

While the curriculum can vary, certain foundational topics are essential for all learners. Focusing on these concepts ensures children gain a comprehensive grasp of elementary math.

Number Sense and Place Value

Building a solid number sense means children understand the size and order of numbers, how they relate, and how to manipulate them. Place value knowledge, such as understanding the difference between tens and ones, is critical for performing operations like addition and subtraction fluently.

Basic Operations and Their Properties

Mastery of addition, subtraction, multiplication, and division is the core of elementary math. Teaching the properties of operations—commutative, associative, and distributive—helps students develop flexible strategies for computation.

Introduction to Fractions and Decimals

Introducing fractions and decimals early builds familiarity with concepts of parts and wholes, measurement, and division. Using visual models like pie charts or number lines can demystify these ideas and prepare students for more advanced math.

Geometry and Measurement

Recognizing shapes, understanding symmetry, and learning to measure length, weight, and volume connect math to the physical world. These experiences enhance spatial reasoning and help children make sense of their environment.

Overcoming Challenges in Knowing and Teaching Elementary Mathematics

Despite best efforts, teaching math can present hurdles for both educators and students. Addressing these challenges thoughtfully can improve outcomes

and sustain enthusiasm for learning.

Addressing Math Anxiety Early

Math anxiety can hinder a child’s progress and confidence. Creating a relaxed atmosphere, celebrating effort over correctness, and using positive reinforcement help reduce stress. Encouraging children to approach problems step-by-step and providing plenty of practice builds competence and eases fear.

Differentiating Instruction

Every child learns differently. Some grasp concepts quickly, while others need repeated exposure or alternative explanations. Differentiated instruction—offering varied activities and pacing—ensures all students receive instruction that meets their individual needs.

Engaging Parents and Caregivers

Parents play a vital role in reinforcing math skills outside the classroom. Offering resources, workshops, or simple at-home activities enables caregivers to support their children’s learning effectively. Communication between teachers and families creates a consistent and encouraging learning environment.

Resources and Tools to Support Knowing and Teaching Elementary Mathematics

A variety of resources can aid educators and parents in delivering effective math instruction.

- **Manipulatives:** Physical tools like base-ten blocks, fraction circles, and counting beads.
- **Math Apps and Games:** Platforms such as Khan Academy Kids, Prodigy, and SplashLearn offer interactive math practice tailored to elementary learners.
- **Worksheets and Printables:** Customizable materials aligned with learning standards help reinforce concepts.

- **Books:** Math storybooks and activity guides that blend narrative with math skills.
- **Professional Development:** Workshops and courses for educators to stay updated on teaching methodologies and curriculum changes.

Using these tools in combination can cater to different learning styles and keep math instruction fresh and dynamic.

Encouraging a Lifelong Love for Mathematics

Ultimately, knowing and teaching elementary mathematics is about more than passing tests or completing homework; it’s about inspiring curiosity and resilience. When children see math as a useful, approachable, and even enjoyable subject, they carry those attitudes forward into higher education and everyday problem-solving.

Celebrating progress, connecting math to interests like sports statistics or nature patterns, and maintaining a patient, cheerful approach can transform the learning experience. When educators and parents collaborate with this mindset, they help children grow into confident learners and thinkers, equipped with the numeracy skills essential for success in an increasingly data-driven world.

Frequently Asked Questions

What are effective strategies for teaching elementary mathematics to young learners?

Effective strategies include using hands-on activities, visual aids, real-life examples, and interactive games to make math concepts relatable and engaging for young learners.

How can teachers assess students' understanding of elementary math concepts?

Teachers can use formative assessments such as quizzes, observations, math journals, and one-on-one discussions to gauge students' comprehension and identify areas needing reinforcement.

Why is it important to build a strong number sense

in elementary students?

A strong number sense helps students understand the meaning of numbers, their relationships, and how to manipulate them, which is foundational for mastering more complex math skills later on.

How can technology be integrated into teaching elementary mathematics effectively?

Technology can be integrated through interactive math apps, virtual manipulatives, and online games that provide instant feedback and personalized learning experiences for students.

What role does language play in learning and teaching elementary mathematics?

Language is crucial as it helps students understand math vocabulary, follow instructions, explain reasoning, and communicate mathematical ideas clearly.

How can teachers differentiate math instruction to meet diverse learners’ needs in elementary classrooms?

Teachers can differentiate by providing varied tasks at different difficulty levels, using flexible grouping, offering additional support or challenges, and incorporating multiple representation methods.

What are common misconceptions in elementary mathematics, and how can teachers address them?

Common misconceptions include misunderstandings about place value, operations, and fractions. Teachers can address these by using concrete examples, encouraging student explanations, and correcting errors through guided practice.

Additional Resources

Knowing and Teaching Elementary Mathematics: A Professional Review

knowing and teaching elementary mathematics is a foundational aspect of education that shapes students' cognitive development and problem-solving abilities. As the gateway to more advanced mathematical concepts, elementary math education requires a nuanced understanding not only of the subject matter but also of effective pedagogical strategies. With increasing emphasis on STEM education worldwide, educators and policymakers are continually exploring methods to enhance the teaching and learning of mathematics at the

elementary level. This article investigates the critical components of knowing and teaching elementary mathematics, examining pedagogical approaches, curriculum design, teacher competencies, and the impact of technology.

The Importance of Knowing Elementary Mathematics

A solid grasp of elementary mathematics is more than an academic requirement; it is a crucial life skill. Knowing elementary mathematics encompasses understanding basic arithmetic operations, number sense, measurement, geometry, and data interpretation. According to the National Assessment of Educational Progress (NAEP, 2019), proficiency in these areas during early schooling correlates strongly with later academic success, particularly in science, technology, and engineering disciplines.

Elementary mathematics knowledge forms the scaffolding for critical thinking and analytical skills. Students who develop fluency in fundamental math concepts tend to exhibit greater confidence and resilience when confronted with complex problems. Conversely, gaps in early math understanding often lead to persistent difficulties, underscoring the importance of early intervention.

Teaching Elementary Mathematics: Approaches and Strategies

Teaching elementary mathematics effectively demands a blend of content knowledge and pedagogical skill. Teachers must be adept at translating abstract concepts into concrete, relatable experiences for young learners. Several instructional methodologies have gained prominence in recent years.

Traditional vs. Contemporary Methods

Traditional teaching methods often rely on rote memorization and repetitive drills to instill arithmetic skills. While this approach ensures procedural fluency, it may limit deeper conceptual understanding and student engagement. In contrast, contemporary methodologies, such as inquiry-based learning and manipulatives-oriented instruction, encourage exploration and active participation.

Inquiry-based learning invites students to pose questions, investigate patterns, and derive mathematical principles through guided discovery. For example, instead of merely memorizing multiplication tables, students might

use physical objects or visual models to observe multiplication as repeated addition, fostering meaningful comprehension.

Manipulatives—like blocks, counters, and geometric shapes—serve as tactile tools that bridge the gap between concrete experiences and abstract reasoning. Research published in the Journal of Mathematical Behavior (2020) indicates that students exposed to manipulative-based lessons demonstrate improved problem-solving skills and higher retention rates.

Integrating Technology in Math Education

The integration of digital tools in elementary math classrooms has transformed traditional teaching paradigms. Educational software, interactive games, and virtual manipulatives provide personalized learning experiences catering to diverse student needs.

Adaptive learning platforms analyze individual student performance and adjust difficulty levels accordingly, promoting mastery learning. For instance, platforms like DreamBox and Khan Academy offer tailored math practice that aligns with each student's pace. According to a 2021 study by the Education Endowment Foundation, technology-assisted math instruction can lead to an average improvement of 4 months in student learning.

However, reliance on technology also poses challenges, such as screen fatigue and equity issues related to access. Effective teaching balances digital resources with hands-on activities and direct teacher-student interaction.

Teacher Competencies in Elementary Mathematics Education

Effective teaching of elementary mathematics hinges on teacher proficiency in both content and pedagogy. The concept of "mathematical knowledge for teaching" (MKT), introduced by education researcher Deborah Ball, emphasizes the specialized knowledge teachers require to anticipate student misconceptions and present concepts clearly.

Professional Development and Training

Studies reveal that teachers with robust MKT backgrounds are better equipped to facilitate conceptual understanding. For example, a 2018 report by the National Council of Teachers of Mathematics (NCTM) highlights that ongoing professional development significantly enhances teacher effectiveness.

Professional development programs focusing on content knowledge,

instructional strategies, and assessment techniques enable teachers to refine their practice. Peer collaboration and coaching also contribute to sustained improvement, fostering communities of practice where educators share insights and resources.

Assessment and Feedback

Formative assessment is a critical component of teaching elementary mathematics. Regular, low-stakes assessments provide real-time insights into student comprehension, allowing teachers to adjust instruction promptly. Effective feedback supports student learning by addressing errors constructively and encouraging a growth mindset.

By incorporating diagnostic tools and reflective practices, teachers can identify learning gaps early and implement targeted interventions, reducing the risk of long-term difficulties.

Curriculum Design and Content Sequencing

The structure of elementary math curricula profoundly influences learning outcomes. An effective curriculum balances skill acquisition with conceptual understanding, progressing from concrete to abstract levels.

Spiral vs. Mastery Approaches

Curricula may adopt spiral or mastery approaches. Spiral curricula revisit topics with increasing complexity over time, reinforcing prior knowledge while introducing new concepts. This approach supports cumulative learning and retention.

Mastery curricula, conversely, focus on achieving proficiency in one topic before advancing, ensuring depth rather than breadth. Both approaches have merits; the choice often depends on educational contexts and learner needs.

Incorporating Real-World Applications

Embedding real-world problems within the curriculum enhances relevance and motivation. Applying math to everyday scenarios—such as budgeting, cooking measurements, or time management—demonstrates the practical value of mathematical skills. This contextualization fosters engagement and helps students develop transferable skills.

Challenges and Considerations in Teaching Elementary Mathematics

Despite advances in pedagogical research and technology, challenges persist in knowing and teaching elementary mathematics effectively.

Addressing Diverse Learner Needs

Classrooms are increasingly diverse, with students exhibiting varied learning styles, language backgrounds, and cognitive abilities. Differentiated instruction is essential to accommodate these differences. However, the lack of resources and training can impede teachers' ability to tailor lessons effectively.

Math Anxiety and Student Attitudes

Math anxiety, even at the elementary level, can hinder student performance and engagement. Teachers play a vital role in creating a supportive environment that reduces fear and builds confidence. Strategies include positive reinforcement, collaborative learning, and emphasizing process over speed.

Equity and Access

Disparities in educational resources, including access to quality teachers and technology, create inequities in math learning outcomes. Bridging these gaps requires systemic efforts from educators, administrators, and policymakers.

Knowing and teaching elementary mathematics is a multifaceted endeavor that demands continuous reflection and adaptation. By combining deep content knowledge, innovative teaching strategies, and responsive assessment, educators can cultivate a generation of learners equipped with essential mathematical skills and a positive disposition toward the subject. The evolving landscape of education challenges stakeholders to embrace evidence-based practices and equity-driven initiatives to ensure all students succeed in their mathematical journeys.

Knowing And Teaching Elementary Mathematics

knowing and teaching elementary mathematics: Knowing and Teaching Elementary Mathematics Liping Ma, 2010-03-26 Studies of teachers in the U.S. often document insufficient subject matter knowledge in mathematics. Yet, these studies give few examples of the knowledge teachers need to support teaching, particularly the kind of teaching demanded by recent reforms in mathematics education. Knowing and Teaching Elementary Mathematics describes the nature and development of the knowledge that elementary teachers need to become accomplished mathematics teachers, and suggests why such knowledge seems more common in China than in the United States, despite the fact that Chinese teachers have less formal education than their U.S. counterparts. The anniversary edition of this bestselling volume includes the original studies that compare U.S and Chinese elementary school teachers' mathematical understanding and offers a powerful framework for grasping the mathematical content necessary to understand and develop the thinking of school children. Highlighting notable changes in the field and the author's work, this new edition includes an updated preface, introduction, and key journal articles that frame and contextualize this seminal work.

knowing and teaching elementary mathematics: Book Review Roger Howe, Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching, American Mathematical Society, 2000

knowing and teaching elementary mathematics: Knowing and Learning Mathematics for Teaching National Research Council, Mathematical Sciences Education Board, Center for Education, Mathematics Teacher Preparation Content Workshop Program Steering Committee, 2001-01-25 There are many questions about the mathematical preparation teachers need. Recent recommendations from a variety of sources state that reforming teacher preparation in postsecondary institutions is central in providing quality mathematics education to all students. The Mathematics Teacher Preparation Content Workshop examined this problem by considering two central questions: What is the mathematical knowledge teachers need to know in order to teach well? How can teachers develop the mathematical knowledge they need to teach well? The Workshop activities focused on using actual acts of teaching such as examining student work, designing tasks, or posing questions, as a medium for teacher learning. The Workshop proceedings, Knowing and Learning Mathematics for Teaching, is a collection of the papers presented, the activities, and plenary sessions that took place.

knowing and teaching elementary mathematics: The Math Teachers Know Brent Davis, Moshe Renert, 2013-07-18 What sorts of mathematics competencies must teachers have in order to teach the discipline well? This book offers a novel take on the question. Most research is focused on explicit knowledge–that is, on the sorts of insights that might be specified, catalogued, taught, and tested. In contrast, this book focuses on the tacit dimensions of teachers' mathematics knowledge that precede and enable their competencies with formal mathematics. It highlights the complexity of this knowledge and offers strategies to uncover it, analyze it, and re-synthesize it in ways that will make it more available for teaching. Emerging from 10 years of collaborative inquiry with practicing teachers, it is simultaneously informed by the most recent research and anchored to the realities of teachers' lives in classrooms.

knowing and teaching elementary mathematics: *The Mathematics that Every Secondary Math Teacher Needs to Know* Alan Sultan, Alice F. Artzt, 2010-09-13 What knowledge of mathematics do secondary school math teachers need to facilitate understanding, competency, and interest in mathematics for all of their students? This unique text and resource bridges the gap between the mathematics learned in college and the mathematics taught in secondary schools. Written in an informal, clear, and interactive learner-centered style, it is designed to help pre-service and in-service teachers gain the deep mathematical insight they need to engage their

students in learning mathematics in a multifaceted way that is interesting, developmental, connected, deep, understandable, and often, surprising and entertaining. Features include Launch questions at the beginning of each section, Student Learning Opportunities, Questions from the Classroom, and highlighted themes throughout to aid readers in becoming teachers who have great MATH-N-SIGHT: M Multiple Approaches/Representations A Applications to Real Life T Technology H History N Nature of Mathematics: Reasoning and Proof S Solving Problems I Interlinking Concepts: Connections G Grade Levels H Honing of Mathematical Skills T Typical Errors This text is aligned with the recently released Common Core State Standards, and is ideally suited for a capstone mathematics course in a secondary mathematics certification program. It is also appropriate for any methods or mathematics course for pre- or in-service secondary mathematics teachers, and is a valuable resource for classroom teachers.

knowing and teaching elementary mathematics: *ENC Focus* , 2000

knowing and teaching elementary mathematics: What We Know About Mathematics Teaching and Learning McREL, 2011-09-20 This book supports mathematics education reform and brings the rich world of education research and practice to pre-K–12 educators. Designed for accessibility, each chapter is broken down into important questions. For each question, the authors provide background information from a research perspective, offer implications for improving classroom instruction, and list resources for further reading.

knowing and teaching elementary mathematics: Improving Teacher Knowledge in K-12 Schooling Xiaoxia A. Newton, 2018-03-15 This volume examines how several key components of the mathematics education system in the United States fail to provide teachers with adequate and effective tools to teach mathematics in K-12 classrooms. These components consist of teachers' own learning experiences as students in K-12 classrooms, their undergraduate or graduate trainings in mathematics, and their in-service professional development trainings. Newton argues that unless we improve these system components as a whole and recognize the importance of teaching future mathematics teachers explicitly and rigorously the topics they are expected to teach, teachers will continue to recycle a body of incoherent and incomprehensible mathematical knowledge to their students, because these are the only types of mathematical knowledge they have at their disposal, both in terms of what they themselves have learned as K-12 students and in terms of the mathematical resources available to them, including the textbooks they rely on to teach as mathematics teachers.

knowing and teaching elementary mathematics: *Algebra, K-Theory, Groups, and Education* Hyman Bass, Tsit-Yuen Lam, Andy R. Magid, 1999 This volume includes expositions of key developments over the past four decades in commutative and non-commutative algebra, algebraic K-theory, infinite group theory, and applications of algebra to topology. Many of the articles are based on lectures given at a conference at Columbia University honoring the 65th birthday of Hyman Bass. Important topics related to Bass's mathematical interests are surveyed by leading experts in the field. Of particular note is a professional autobiography of Professor Bass, and an article by Deborah Ball on mathematical education. The range of subjects covered in the book offers a convenient single source for topics in the field.

knowing and teaching elementary mathematics: Understanding Others, Educating Ourselves National Research Council, Division of Behavioral and Social Sciences and Education, Center for Education, Board on Testing and Assessment, Board on International Comparative Studies in Education, Committee on a Framework and Long-term Research Agenda for International Comparative Education Studies, 2003-05-22 Since 1988, the Board on International Comparative Studies in Education (BICSE) at the (U.S.) National Research Council of the National Academies has engaged in activities designed to increase the rigor and sophistication of international comparative studies in education by encouraging synergies between large and smaller scale international comparative education research, to identify gaps in the existing research base, and to assist in communicating results to policy makers and the public. Under the current grant (1998-2002), funded by the National Science Foundation and the U.S. Department of Education's National Center

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knowing and teaching elementary mathematics: Arithmetic for Teachers Gary R. Jensen, 2003-11-25 Excellent teaching of mathematics at the elementary school level requires that the teacher be an expert in school mathematics. This textbook for prospective teachers presents topics from the K-6 mathematics curriculum, but at a greater depth than is usually found in the classroom. The added knowledge that comes from this approach gives the teacher essential insight into how the topics interrelate and where difficulties might lie. With this deeper mathematical preparation, the teacher is better able to explain concepts, demonstrate computational procedures and lead students through problem-solving techniques. The primary focus is on the foundations of arithmetic, along with a selection of topics from geometry and a wide range of applications. The number line is used throughout to visualize concepts and to tie them to the solution of problems. The book emphasizes how to explain the concepts and how to explain problem solutions. This is a textbook for a college course in mathematics for prospective elementary school teachers. It will also be a resource for the instructors of such courses.

knowing and teaching elementary mathematics: How Chinese Teach Mathematics and Improve Teaching Yeping Li, Rongjin Huang, 2013 How Chinese Teach Mathematics and Improve Teaching builds upon existing studies to examine mathematics classroom instruction in China. It combines contributions from Chinese scholars with commentary from key Western scholars to offer a truly systematic examination of some important and distinctive features of mathematics classroom instruction. Viewing classroom instruction as part of teachers' instructional practices, this book goes beyond teachers' in-classroom instructional practice by also examining Chinese teachers' approaches and practices in developing and improving teaching. Through this unique approach, How Chinese Teach Mathematics and Improve Teaching expands and unpacks the otherwise fragmented knowledge about Chinese practices in developing and carrying out mathematics classroom instruction.

knowing and teaching elementary mathematics: Exploring Mathematics and Science Teachers' Knowledge Hamsa Venkat, Marissa Rollnick, John Loughran, Mike Askew, 2014-05-09 Globally, mathematics and science education faces three crucial challenges: an increasing need for mathematics and science graduates; a declining enrolment of school graduates into university studies in these disciplines; and the varying quality of school teaching in these areas. Alongside these challenges, internationally more and more non-specialists are teaching mathematics and science at both primary and secondary levels, and research evidence has revealed how gaps and limitations in teachers’ content understandings can lead to classroom practices that present barriers to students’ learning. This book addresses these issues by investigating how teachers’ content knowledge interacts with their pedagogies across diverse contexts and perspectives. This knowledge-practice nexus is examined across mathematics and science teaching, traversing schooling phases and countries, with an emphasis on contexts of disadvantage. These features push the boundaries of research into teachers’ content knowledge. The book’s combination of mathematics and science enriches each discipline for the reader, and contributes to our understandings of student attainment by examining the nature of specialised content knowledge needed for competent teaching within and across the two domains. Exploring Mathematics and Science Teachers’ Knowledge will be key reading for researchers, doctoral students and postgraduates with a focus on Mathematics, Science and teacher knowledge research.

knowing and teaching elementary mathematics: The Handbook of Mathematics Teacher Education: Volume 4 , 2008-01-01 The Handbook of Mathematics Teacher Education, the first of its kind, addresses the learning of mathematics teachers at all levels of schooling to teach

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knowing and teaching elementary mathematics: *How Chinese Learn Mathematics* Lianghuo Fan, 2004 The book has been written by an international group of very activeresearchers and scholars who have a passion for the study of Chinesemathematics education. It aims to provide readers with a comprehensiveand updated picture of the teaching and learning of mathematicsinvolving Chinese students from various perspectives, including theways in which Chinese students learn mathematics in classrooms, schools and homes, the influence of the cultural and socialenvironment on Chinese students'' mathematics learning, and thestrengths and weaknesses of the ways in which Chinese learnmathematics

knowing and teaching elementary mathematics: *Teaching Mathematics to Middle School Students with Learning Difficulties* Marjorie Montague, Asha K. Jitendra, 2006-06-24 A highly practical resource for special educators and classroom teachers, this book provides specific instructional guidance illustrated with vignettes, examples, and sample lesson plans. Every chapter is grounded in research and addresses the nuts and bolts of teaching math to students who are not adequately prepared for the challenging middle school curriculum. Presented are a range of methods for helping struggling learners build their understanding of foundational concepts, master basic skills, and develop self-directed problem-solving strategies. While focusing on classroom instruction, the book also includes guidelines for developing high-quality middle school mathematics programs and evaluating their effectiveness.

knowing and teaching elementary mathematics: Lesson Study Research and Practice in Mathematics Education Lynn C. Hart, Alice S. Alston, Aki Murata, 2011-01-11 Lesson study is a professional development process that teachers engage in to systematically examine their practice,

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knowing and teaching elementary mathematics: Activities for Elementary Mathematics Teachers Dan Dolan, Jim Williamson, Mari Muri, 2003

knowing and teaching elementary mathematics: *Understanding History Teaching* Husbands, Chris, Kitson, Alison, Pendry, Anna, 2003-09-01 Drawing on fieldwork in secondary schools and on research studies worldwide, the authors pose fundamental questions about the way teachers teach and learners learn -- book cover.

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