

# math professional development for elementary teachers

**math professional development for elementary teachers** is an essential component in enhancing the instructional skills and content knowledge of educators who teach young learners. This type of training equips teachers with effective strategies, resources, and methodologies to improve students' mathematical understanding and performance. In today's educational landscape, continuous learning for teachers is vital to keep pace with evolving curriculum standards and diverse student needs. Math professional development for elementary teachers focuses on both content mastery and pedagogical techniques, ensuring that educators can confidently deliver math lessons that foster critical thinking and problem-solving skills. This article explores the importance, key components, delivery methods, and best practices of math professional development tailored for elementary educators. Additionally, it addresses the challenges and solutions in implementing these programs effectively. The following sections provide a comprehensive overview of the topic.

- Importance of Math Professional Development for Elementary Teachers
- Key Components of Effective Math Professional Development
- Delivery Methods for Math Professional Development
- Best Practices for Implementing Math Professional Development
- Challenges and Solutions in Math Professional Development

## Importance of Math Professional Development for Elementary Teachers

Math professional development for elementary teachers plays a critical role in improving the quality of math instruction in early education. Elementary teachers often face the challenge of teaching foundational math concepts to diverse learners with varying abilities and backgrounds. Professional development ensures that teachers deepen their understanding of math content, which enhances their confidence and effectiveness in the classroom. Furthermore, ongoing training helps educators stay updated with current educational standards such as the Common Core State Standards (CCSS) and other state-specific guidelines. This alignment ensures that teaching practices are consistent and that students acquire the skills necessary for higher-level math courses.

## **Enhancing Content Knowledge**

One of the primary goals of math professional development is to strengthen teachers' mathematical content knowledge. Many elementary educators may have limited math backgrounds, making it challenging to teach concepts beyond basic arithmetic. Professional development programs provide focused instruction on mathematical reasoning, number sense, operations, geometry, measurement, and data analysis. This enhanced knowledge base enables teachers to explain concepts more clearly and respond effectively to student questions.

## **Improving Instructional Strategies**

Beyond content mastery, professional development introduces teachers to research-based instructional strategies tailored for young learners. These include hands-on learning, use of manipulatives, visual representations, and integrating math with real-world applications. Training also covers formative assessment techniques to monitor student progress and adjust instruction accordingly. Such strategies promote active engagement, conceptual understanding, and problem-solving skills in elementary math classrooms.

## **Key Components of Effective Math Professional Development**

Effective math professional development for elementary teachers consists of several crucial components that collectively enhance teacher capacity and student outcomes. These components are designed to provide comprehensive support and ensure that learning translates into improved classroom practices.

### **Ongoing and Sustained Learning**

Professional development should not be a one-time event but rather an ongoing process. Sustained training over weeks or months allows teachers to gradually implement new strategies, reflect on their practice, and receive feedback. Continuous learning opportunities help reinforce concepts and encourage collaboration among educators.

### **Content-Focused Training**

Focusing directly on mathematical content ensures that teachers build a strong foundation in the subject matter. Content-focused training addresses common misconceptions, deepens understanding of key concepts, and aligns with curriculum standards. This approach helps teachers develop the expertise necessary for effective math instruction.

## **Active Learning Experiences**

Active learning techniques such as collaborative problem solving, lesson planning, and peer observations engage teachers in meaningful ways. These experiences promote reflection and practical application of new knowledge, making professional development more impactful.

## **Coaching and Support**

Providing ongoing coaching and mentorship supports teachers as they integrate new skills into their classrooms. Coaches can offer personalized feedback, model effective instruction, and assist with troubleshooting challenges, thereby increasing the likelihood of sustained change.

## **Alignment with Standards and Curriculum**

Professional development must align with current educational standards and the specific curriculum used within schools. This alignment ensures relevance and facilitates the transfer of learning into actual teaching practices.

## **Delivery Methods for Math Professional Development**

Various delivery methods are used to provide math professional development for elementary teachers, each offering unique advantages. Selecting appropriate formats depends on factors such as teacher needs, resources, and scheduling constraints.

### **Workshops and Seminars**

Traditional in-person workshops and seminars offer intensive, focused training sessions. These events often span one or multiple days and provide opportunities for direct interaction with experts, hands-on activities, and

collaborative learning.

## **Online Courses and Webinars**

Online professional development offers flexibility and accessibility, allowing teachers to engage in learning at their own pace and convenience. Webinars provide real-time instruction and discussion, while asynchronous courses enable self-directed study. Digital platforms often include interactive components such as quizzes and discussion forums.

## **Professional Learning Communities (PLCs)**

PLCs bring teachers together regularly to discuss instructional strategies, analyze student data, and share best practices. This collaborative approach fosters a culture of continuous improvement and collective responsibility for student learning.

## **Coaching and Mentoring**

One-on-one coaching and mentoring provide personalized support tailored to individual teacher needs. Coaches observe classroom instruction, offer feedback, and help teachers refine their techniques, promoting sustained professional growth.

## **Best Practices for Implementing Math Professional Development**

Successful implementation of math professional development for elementary teachers requires careful planning and adherence to proven best practices. These practices maximize the effectiveness of training programs and enhance teacher engagement.

## **Needs Assessment**

Conducting a thorough needs assessment helps identify specific areas where teachers require support. Understanding teacher strengths, weaknesses, and student performance data guides the design of targeted professional development activities.

## **Collaborative Planning**

Involving teachers in the planning process fosters ownership and ensures that the content is relevant and practical. Collaboration between administrators, coaches, and educators promotes alignment with school goals and teacher schedules.

## **Incorporating Hands-On Activities**

Hands-on learning experiences, such as using manipulatives or designing lesson plans, enhance teacher engagement and deepen understanding. These activities model effective instructional techniques and encourage experimentation.

## **Providing Resources and Materials**

Offering access to high-quality instructional materials, lesson plans, and assessment tools supports teachers in applying new strategies. Well-curated resources reduce preparation time and increase confidence.

## **Ongoing Evaluation and Feedback**

Regular evaluation of professional development effectiveness through surveys, observations, and student outcome analysis informs continuous improvement. Providing constructive feedback to teachers helps refine their practice and sustain growth.

## **Challenges and Solutions in Math Professional Development**

Despite its importance, math professional development for elementary teachers faces several challenges that can hinder its success. Identifying these obstacles and implementing solutions is crucial for achieving meaningful outcomes.

### **Time Constraints**

Teachers often have limited time for professional development due to busy

schedules and classroom responsibilities. To address this, schools can integrate training into existing meeting times, offer flexible online options, or provide substitutes to release teachers for training.

## **Lack of Engagement**

Some teachers may perceive math professional development as irrelevant or overly theoretical. Ensuring content is practical, differentiated, and directly applicable to classroom instruction increases engagement and motivation.

## **Insufficient Follow-Up**

Without ongoing support, initial gains from professional development may diminish over time. Implementing coaching, peer collaboration, and refresher sessions helps sustain improvements in teaching practice.

## **Resource Limitations**

Limited funding and materials can restrict the scope and quality of professional development. Schools can seek grants, partner with educational organizations, and utilize free online resources to supplement training efforts.

## **Varied Teacher Skill Levels**

Teachers come with diverse backgrounds and proficiency levels in math, making a one-size-fits-all approach ineffective. Offering differentiated training and personalized coaching addresses individual needs more effectively.

- Integrate flexible scheduling and online options to mitigate time constraints.
- Design relevant, hands-on sessions to boost teacher engagement.
- Provide continuous coaching and peer support for sustained growth.
- Leverage external resources and partnerships to overcome budget issues.
- Customize training to meet varied teacher skill levels.

## **Frequently Asked Questions**

### **What are the key benefits of math professional development for elementary teachers?**

Math professional development helps elementary teachers deepen their content knowledge, improve instructional strategies, and increase confidence in teaching math, leading to better student outcomes.

### **How can math professional development be tailored specifically for elementary teachers?**

It can be tailored by focusing on foundational math concepts, hands-on activities, age-appropriate pedagogical strategies, and addressing common misconceptions among young learners.

### **What are some effective formats for delivering math professional development to elementary educators?**

Effective formats include workshops, coaching sessions, collaborative lesson planning, online courses, and ongoing professional learning communities.

### **How does math professional development impact student achievement in elementary schools?**

When elementary teachers receive targeted math professional development, they are better equipped to deliver high-quality instruction, which leads to improved student engagement, understanding, and standardized test scores.

### **What role does technology play in math professional development for elementary teachers?**

Technology can provide interactive tools, virtual manipulatives, and access to a wide range of resources that enhance teachers' learning and help them integrate tech-based math instruction in their classrooms.

### **How can professional development support elementary teachers in differentiating math instruction?**

Professional development can provide strategies and resources to assess student needs, implement tiered activities, and use flexible grouping to meet diverse learners at their individual levels.

# What challenges do elementary teachers face in math instruction that professional development can address?

Challenges include limited math content knowledge, lack of confidence, difficulty engaging students, and managing diverse learning needs; professional development offers targeted support to overcome these obstacles.

## Additional Resources

### 1. *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching*

This book by Jo Boaler explores how teachers can foster a growth mindset in their students to develop a positive relationship with math. It provides practical strategies, activities, and messages that encourage students to embrace challenges and persist in problem-solving. Elementary teachers will find valuable insights on how to create a classroom culture that supports deep mathematical understanding.

### 2. *Elementary and Middle School Mathematics: Teaching Developmentally*

Written by John A. Van de Walle, this comprehensive resource offers strategies and methods tailored for teaching math concepts effectively to young learners. The book emphasizes conceptual understanding, problem-solving, and the use of manipulatives. It supports teachers in designing lessons that meet diverse student needs and align with standards.

### 3. *Number Talks: Helping Children Build Mental Math and Computation Strategies*

Sherry Parrish's book introduces the Number Talks approach, which encourages students to discuss and reason about math problems mentally. It provides detailed guidance on facilitating classroom discussions that enhance computational fluency and number sense. This resource is ideal for elementary teachers seeking to develop students' mental math skills and confidence.

### 4. *Making Number Talks Matter: Developing Mathematical Practices and Deepening Understanding, Grades K-5*

Catherine Lewis, Pam Schifter, and Cathy Humphreys delve deeper into the Number Talks practice, offering strategies to improve teacher facilitation and student engagement. The book includes examples, video links, and professional learning ideas to help educators refine their instructional techniques. It supports teachers in creating rich mathematical conversations that build conceptual understanding.

### 5. *Mathematics Formative Assessment, Grades K-6: 75 Practical Strategies for Linking Assessment, Instruction, and Learning*

By Page Keeley and Cheryl Rose Tobey, this book presents a collection of formative assessment strategies that help teachers identify student misconceptions and guide instruction. It includes ready-to-use tools and questions that promote ongoing assessment and feedback. Elementary educators

will find it useful for improving student learning outcomes in math.

#### *6. Engaging Children's Minds: The Project Approach*

Although broader in scope, this book by Lilian G. Katz and Sylvia C. Chard includes strong applications for math learning through project-based experiences. It encourages teachers to integrate math concepts into meaningful projects that connect with students' interests. The approach helps build problem-solving, collaboration, and critical thinking skills in young learners.

#### *7. Math Work Stations: Independent Learning You Can Count On, Grades K-2*

Debbie Diller's book focuses on creating effective math workstations that foster independent practice and exploration. It offers ideas for organizing materials, designing activities, and managing classroom routines. Elementary teachers will appreciate the hands-on strategies that support differentiated learning and student engagement.

#### *8. Developing Essential Understanding of Addition and Subtraction for Teaching Mathematics in Grades Pre-K-5*

This volume from the National Council of Teachers of Mathematics (NCTM) provides a deep dive into the concepts underlying addition and subtraction. It helps teachers build a strong mathematical foundation to enhance instruction and student comprehension. The book includes research-based insights and classroom applications relevant to elementary educators.

#### *9. Visible Learning for Mathematics, Grades K-12: What Works Best to Optimize Student Learning*

John Hattie and Douglas Fisher analyze research on effective math teaching practices and their impact on student achievement. The book offers evidence-based strategies tailored for different grade levels, including elementary. Teachers will find practical guidance on how to maximize learning through targeted feedback, clear learning intentions, and high-impact instructional methods.

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**math professional development for elementary teachers: Designing Professional Development for Teachers of Science and Mathematics** Susan Loucks-Horsley, Katherine E. Stiles, Susan Mundry, Nancy Love, Peter W. Hewson, 2009-11-24 The classic guide for designing robust science and mathematics professional development programs! This expanded edition of one of the most widely cited resources in the field of professional development for mathematics and science educators demonstrates how to design professional development experiences for teachers

that lead to improved student learning. Presenting an updated professional development (PD) planning framework, the third edition of the bestseller reflects recent research on PD design, underscores how beliefs and local factors can influence PD design, illustrates a wide range of PD strategies, and emphasizes the importance of: Continuous program monitoring Combining strategies to address diverse needs Building cultures that sustain learning

**math professional development for elementary teachers: Teachers' Professional Development and the Elementary Mathematics Classroom** Sophia Cohen, 2004-07-13 This book illustrates the experiences of elementary school teachers across one year's time as they participated in a teacher development seminar focused on mathematics, and as a result changed their beliefs, their knowledge, and their practices. It explores these experiences as a means of understanding the learning that takes a teacher from a more traditional teaching practice to one that is focused on the ideas and understandings that students and teachers have of the subject matter. The work emerges from and reports on a unique data set from a two-year study of teacher learning that was funded by the Spencer and MacArthur foundations. The teachers, whose work is at the center of this study, were participants in the Developing Mathematical Ideas seminar (DMI), a mathematics teacher development seminar for elementary school teachers. This seminar is one example of intensive, domain-specific professional development. In this seminar teachers study elementary mathematics content to deepen their own understanding of it, they study the development among children of the ideas central to elementary mathematics, and they experience a teaching and learning environment consistent with the pedagogy envisioned by the National Council for Teachers of Mathematics' Principles and Standards for School Mathematics. The seminar is a nationally available teacher development curriculum, thus interested educators can gain access to the resources necessary to offer similar seminars in their own communities. Teachers' Professional Development and the Elementary Mathematics Classroom: Bringing Understandings to Light will be widely interesting to a broad audience, including mathematics teacher educators, teacher education researchers, policymakers, and classroom teachers. It will serve well as a text in a range of graduate courses dealing with teacher cognition/knowledge for teaching, mathematics methods, psychology of learning, and pedagogical theory.

**math professional development for elementary teachers: Learning to Lead Mathematics Professional Development** Catherine Carroll, Judith Mumme, 2007-05-12 This set of mathematics seminars is the ideal resource for people charged with supporting teacher leaders and others who lead mathematics professional development. Potential users include curriculum leaders, math-science partnerships, university-district partnerships, and mathematics teacher educators.--BOOK JACKET.

**math professional development for elementary teachers: Designing Professional Development for Teachers of Science and Mathematics** Susan Loucks-Horsley, 2003-02-14 This New Edition collects and brings together in one place what has been learned from professional developers efforts across the country in order to make the framework, principles, and strategies of the first edition come to life. This edition deepens our understanding of professional development through further research and new resources. The original purpose of this book to put a competent and caring teacher in every classroom has yet to be fulfilled and is more urgent now than ever. The authors provide one-stop shopping for busy practitioners that incorporates the most up-to-date research gleaned from the broadest possible research base as well as robust and rich descriptions of effective professional development programmes. It incorporates the growing knowledge base about learning, teaching, the nature of science and mathematics, professional development, and change. The authors scanned the field of professional development in mathematics and science over the last five years, noting what has changed and what has not, dissected the original framework, updated examples, incorporate what authors have learned as well as advances in the field. This essential primer offers a framework that considers key inputs and combines strategies uniquely tailored to their environment and goals; summarizes key knowledge and best practices; provides guidance on assessing one's context; describes strategies that go beyond most common workshops and institutes;

provides real-life examples of how elements of the framework were used to create professional development initiatives; offers references and resources for further exploration and inquiry. Highlights of the Second Edition include: - New design framework that incorporates standards, student learning data, and evaluation techniques - More guidance for assessing context using data - More strategies for professional development, including lesson study, aligning and selecting curriculum, and demonstration lessons. - Stronger real-life examples, including new uses of technology and data-driven designs An essential resource for educators who design, conduct, and support professional development for teachers of mathematics and science, including staff developers, principals, teacher leaders, curriculum supervisors, and leadership teams. College and university faculty in education, science, and mathematics will also find this to be a useful compendium of ideas for improving mathematics and science education.

**math professional development for elementary teachers: Developing Mathematical Proficiency for Elementary Instruction** Yeping Li, Roger E. Howe, W. James Lewis, James J. Madden, 2021-04-23 The need to improve the mathematical proficiency of elementary teachers is well recognized, and it has long been of interest to educators and researchers in the U.S. and many other countries. But the specific proficiencies that elementary teachers need and the process of developing and improving them remain only partially conceptualized and not well validated empirically. To improve this situation, national workshops were organized at Texas A&M University to generate focused discussions about this important topic, with participation of mathematicians, mathematics educators and teachers. *Developing Mathematical Proficiency for Elementary Instruction* is a collection of articles that grew out of those exciting cross-disciplinary exchanges. *Developing Mathematical Proficiency for Elementary Instruction* is organized to probe the specifics of mathematical proficiency that are important to elementary teachers during two separate but inter-connected professional stages: as pre-service teachers in a preparation program, and as in-service teachers teaching mathematics in elementary classrooms. From this rich and inspiring collection, readers may better understand, and possibly rethink, their own practices and research in empowering elementary teachers mathematically and pedagogically, as educators or researchers.

**math professional development for elementary teachers: Learning Trajectories for Teachers** Paola Sztajn, P. Holt Wilson, 2019-06-07 Designed to strengthen the teaching of mathematics in the elementary grades, this book focuses on helping teachers engage in instruction based on learning trajectories (LTs). Renowned scholars, including professional development researcher Hilda Borko, examine four exemplary projects with details on professional development design, teacher learning, and project implementation. Contributors include Hilda Borko, Douglas H. Clements, Susan B. Empson, Victoria R. Jacobs, and Julie Sarama. "This is an amazingly important and valuable resource for mathematics teachers and leaders at any level. It provides the background and understandings so critical for teachers and teacher leaders to regularly consider and use learning trajectories to inform teacher planning and instruction." —Dr. Francis (Skip) Fennell, professor emeritus, McDaniel College, and past president of the Association of Mathematics Teacher Educators and the National Council of Teachers of Mathematics "This is the first book that I've come across that unpacks what it means to have a framework for student learning at the center of one's instruction." —Mary Kay Stein, University of Pittsburgh School of Education "I find this book useful for mathematics educators interested in framing learning trajectories across several domains—including tasks, discourse, curriculum, learners' understanding, and assessment—to support professional development. Learning trajectories help us make connections among the domains and deepens professional knowledge and understanding." —Robert Q. Berry III, University of Virginia, and president of the National Council of Teachers of Mathematics

**math professional development for elementary teachers: 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.

**math professional development for elementary teachers:** Teachers' Professional Development and the Elementary Mathematics Classroom Sophia R. Cohen, 2004 Outlines strategies and techniques for teaching mathematical concepts and skills at the elementary level.

**math professional development for elementary teachers:** Mathematical Teaching and Learning Katherine M. Robinson, Donna Kotsopoulos, Adam K. Dubé, 2023-06-15 This book focusses on teaching and learning in elementary and middle school mathematics and suggests practices for teachers to help children be successful mathematical thinkers. Contributions from diverse theoretical and disciplinary perspectives are explored. Topics include the roles of technology, language, and classroom discussion in mathematics learning, the use of creativity, visuals, and teachers' physical gestures to enhance problem solving, inclusive educational activities to promote children's mathematics understanding, how learning in the home can enhance children's mathematical skills, the application of mathematics learning theories in designing effective teaching tools, and a discussion of how students, teachers, teacher educators, and school boards differentially approach elementary and middle school mathematics. This book and its companion, *Mathematical Cognition and Understanding*, take an interdisciplinary perspective to mathematical learning and development in the elementary and middle school years. The authors and perspectives in this book draw from education, neuroscience, developmental psychology, and cognitive psychology. The book will be relevant to scholars/educators in the field of mathematics education and also those in childhood development and cognition. Each chapter also includes practical tips and implications for parents as well as for educators and researchers.

**math professional development for elementary teachers:** *Tasks in Primary Mathematics Teacher Education* Barbara Clarke, Barbro Grevholm, Richard Millman, 2008-10-25 *Tasks in Primary Mathematics Teacher Education* is intended to advance relevant research and innovative international practices in the preparation and professional development of mathematics teachers. Emerging from discussion at the ICMI study on teacher professional development, this volume, focused on primary and elementary teachers, culls a richness that can only be found by gathering wisdom from varied experiences around the world. The choice of tasks, and the associated pedagogies, is a key aspect of teaching and learning mathematics. Arguing that what students learn is largely defined by the tasks they are given, several major themes are presented. One such major strand, the form, function and focus of tasks, is discussed throughout several chapters, offering analysis, discussion of implementation, and exemplars of a broader category of illustrative techniques for developing critical understanding.

**math professional development for elementary teachers:** Mathematics Professional Development Hilda Borko, Jennifer Jacobs, Karen Koellner, Lyn E. Swackhamer, 2015-04-15 This resource will help school leaders and other professional development providers conduct ongoing, structured learning opportunities for mathematics teachers (K-12). The authors present models for professional development and the preparation of PD leaders designed and field-tested as part of two research projects supported by the National Science Foundation. The Problem-Solving Cycle model and the Mathematics Leadership Preparation model focus on topics of primary interest to mathematics teachers - mathematics content, classroom instruction, and student learning. They are intentionally designed so that they can be tailored to meet the needs and interests of participating teachers and schools. Through engaging vignettes, the authors describe the models, summarize key research findings, and share lessons learned. The book also includes detailed examples of workshop

activities for both teachers and PD leaders.

**math professional development for elementary teachers:** *Teaching by Design in Elementary Mathematics, Grades 2–3* Jennifer Stepanek, Melinda Leong, Linda Griffin, 2010-11-19 This professional learning programme for Key Stage 2 mathematics teaching is grounded in the latest research on the characteristics of effective professional development. The materials help teachers: - deepen their content knowledge for important mathematical concepts in their grade - increase their understanding of how students learn these mathematical ideas - use their knowledge to develop effective lessons and improve instruction - enhance their collaboration skills. The mathematical content of Teaching by Design in Mathematics matches content topics in number and operations identified for each grade by the NCTM Curriculum Focal Points. The culminating activity of the programme is the co-creation of a prototype lesson which is taught to students by team members; the team then investigates the impact of the lesson on student learning. The cycle of investigating, planning, teaching, observing, debriefing, and revising a lesson together contributes to a climate of continuous professional learning.

**math professional development for elementary teachers: Enhancing Professional Development for Teachers** National Research Council, Division of Behavioral and Social Sciences and Education, Center for Education, Teacher Advisory Council, Committee on Enhancing Professional Development for Teachers, 2007-10-04 Teachers, like other professionals, need to stay informed about new knowledge and technologies. Yet many express dissatisfaction with the professional development opportunities made available to them in schools and insist that the most effective development programs they have experienced have been self-initiated. Enhancing Professional Development for Teachers explores how the provision of professional development through online media has had a significant influence on the professional lives of an increasing number of teachers. Growing numbers of educators contend that online teacher professional development (OTPD) has the potential to enhance and even transform teachers' effectiveness in their classrooms and over the course of their careers. They also acknowledge that it raises many challenging questions regarding costs, equity, access to technology, quality of materials, and other issues. Enhancing Professional Development for Teachers suggests that teachers be active participants in planning and implementation of any new technologies that enhance professional development. The book recommends that federal and state policy makers take on the responsibility of promoting equal access to technology while the federal government and foundations play an important role by supporting the development, evaluation, and revision of OTPD.

**math professional development for elementary teachers: The Mathematical Education of Teachers II** Conference Board of the Mathematical Sciences, 2012 This report is a resource for those who teach mathematics and statistics to PreK-12 mathematics teachers, both future teachers and those who already teach in our nation's schools. The report makes recommendations for the mathematics that teachers should know and how they should come to know that mathematics. It urges greater involvement of mathematicians and statisticians in teacher education so that the nation's mathematics teachers have the knowledge, skills, and dispositions needed to provide students with a mathematics education that ensures high school graduates are college- and career-ready as envisioned by the Common Core State Standards. This report draws on the experience and knowledge of the past decade to: Update the 2001 Mathematical Education of Teachers report's recommendations for the mathematical preparation of teachers at all grade levels: elementary, middle, and high school. Address the professional development of teachers of mathematics. Discuss the mathematical knowledge needed by teachers at different grade levels and by others who teach mathematics such as elementary mathematics specialists, special education teachers, and early childhood educators. Each of the MET II writers is a mathematician, statistician, or mathematics educator with substantial expertise and experience in mathematics education. Among them are principal investigators for Math Science Partnerships as well as past presidents and chairs of the American Statistical Association, Association of Mathematics Teacher Educators, Association of State Supervisors of Mathematics, Conference Board of the Mathematical Sciences,

and National Council of Teachers of Mathematics. The audience for this report includes all who teach mathematics to teachers--mathematicians, statisticians, and mathematics educators--and all who are responsible for the mathematical education of teachers--department chairs, educational administrators, and policy-makers at the national, state, school-district, and collegiate levels.

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How do I engage my students in math? 4. How do I help my students talk about math? 5. How do I know what my students know and move them forward? Woven throughout, you'll find helpful sidebar notes on fostering identity and agency; access and equity; teaching in different settings; and invaluable resources for deeper learning. The final question—Where do I go from here?— offers guidance for growing your practice over time. Strive to become the best math educator you can be; your students are counting on it! What will be your first step on the journey?

**math professional development for elementary teachers:** *Math and Science Teacher Content-based Professional Development* Massachusetts. Department of Education, 2007

**math professional development for elementary teachers:** Teaching by Design in Elementary Mathematics, Grades 4–5 Melinda Leong, Jennifer Stepanek, Linda Griffin, 2010-12 This professional learning programme for Key Stage 3 mathematics teaching is grounded in the latest research on the characteristics of effective professional development. The materials help teachers: - deepen their content knowledge for important mathematical concepts in their grade - increase their understanding of how students learn these mathematical ideas - use their knowledge to develop effective lessons and improve instruction - enhance their collaboration skills. The mathematical content of Teaching by Design in Mathematics matches content topics in number and operations identified for each grade by the NCTM Curriculum Focal Points. The culminating activity of the programme is the co-creation of a prototype lesson which is taught to students by team members; the team then investigates the impact of the lesson on student learning. The cycle of investigating, planning, teaching, observing, debriefing, and revising a lesson together contributes to a climate of continuous professional learning.

**math professional development for elementary teachers:** Mathematics Teaching and Learning in K-12 M. Foote, 2010-07-19 The continuing gap in achievement between traditionally underserved students (students of color, English learners, and poor children) and their middle-class white peers, however, has provoked questions of the effectiveness of current mathematics teaching practices for meeting the needs of these students.

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