Teaching Mathematics To

Help your students to think critically and creatively through team-based problem solving instead of focusing on testing and outcomes. Professionals throughout the education system are recognizing that standardized testing is holding students back. Schools tend to view children as outcomes rather than as individuals who require guidance on thinking critically and creatively. Awesome Math focuses on team-based problem solving to teach discrete mathematics, a subject essential for success in the STEM careers of the future. Built on the increasingly popular growth mindset, this timely book emphasizes a problem-solving approach for developing the skills necessary to think critically, creatively, and collaboratively. In its current form, math education is a series of exercises: straightforward problems with easily-obtained answers. Problem solving, however, involves multiple creative approaches to solving meaningful and interesting problems. The authors, co-founders of the multi-layered educational organization AwesomeMath, have developed an innovative approach to teaching mathematics that will enable educators to: Move their students beyond the calculus trap to study the areas of mathematics most of them will need in the modern world Show students how problem solving will help them achieve their educational and career goals and form lifelong communities of support and collaboration Encourage and reinforce curiosity, critical thinking, and creativity in their students Get students into the growth mindset, coach math teams, and make math fun again Create lesson plans built on problem based learning and identify and develop educational resources in their schools Awesome Math: Teaching Mathematics with Problem Based Learning is a must-have resource for general education teachers and math specialists in grades 6 to 12, and resource specialists, special education teachers, elementary educators, and other primary education professionals. This alternative textbook for courses on teaching mathematics asks teachers and prospective teachers to reflect on their relationships with mathematics and how these relationships influence their teaching and the experiences of their students. Applicable to all levels of schooling, the book covers basic topics such as planning and assessment, classroom management, and organization of classroom experiences; it also introduces some novel approaches to teaching mathematics, such as psychoanalytic perspectives and post-modern conceptions of curriculum. Traditional methods-of-teaching issues are recast in a new discourse, provoking new ideas for making mathematics education meaningful to teachers as well as their students. Co-authored by a professor and coordinator of mathematics education programs, with illustrative contributions from practicing elementary, middle, and high school mathematics teachers, this book is a unique collaboration across all pre-college grades, making it ideal for teacher discussion groups at any level. Embracing Mathematics: integrates pedagogy and content exploration in ways that are unique in mathematics education features textboxes
with reflection questions and suggested explorations that can be easily utilized as homework for a course or as discussion opportunities for teacher reading groups offers examples of teachers’ action research projects that grew out of their interactions with the main chapters in the book is not narrowly limited to mathematics education but incorporates curriculum studies – an invaluable asset that allows instructors to find more ways to engage students in self-reflexive acts of teaching Embracing Mathematics is intended as a method text for undergraduate and master’s-level mathematics education courses and more specialized graduate courses on mathematics education, and as a resource for teacher discussion groups.

Marian Small has written the kind of book teachers will keep on their closest shelf as they explore and return to the big ideas of mathematics. In her new resource, Understanding the Math We Teach and How to Teach It, Marian brings the support and insight teachers need to teach math with clarity and confidence. With this new resource, new and experienced teachers alike will focus on the big ideas and practices in mathematics, deepening your own understanding and content knowledge, learn how to teach those big ideas using a student-centered, problem-solving approach, and anticipate student thinking and explore effective tools, models, and rich mathematical questions that nudge student thinking forward. This readable and relatable resource will give you a well-founded base of mathematical knowledge, leading to better math instruction that will capture your students' interest. It is sure to become a trusted treasure you return to again and again.

Develop a deep understanding of mathematics. This user-friendly resource presents grades K–2 teachers with a logical progression of pedagogical actions, classroom norms, and collaborative teacher team efforts to increase their knowledge and improve mathematics instruction. Explore strategies and techniques to effectively learn and teach significant mathematics concepts and provide all students with the precise, accurate information they need to achieve academic success. Clarify math essentials with figures and tables that facilitate understanding through visualization. Benefits Dig deep into mathematical modeling and reasoning to improve as both a learner and teacher of mathematics. Explore how to develop, select, and modify mathematics tasks in order to balance cognitive demand and engage students. Discover the three important norms to uphold in all mathematics classrooms. Learn to apply the tasks, questioning, and evidence (TQE) process to ensure mathematics instruction is focused, coherent, and rigorous. Use charts and diagrams for classifying shapes, which can engage students in important mathematical practices. Access short videos that show what classrooms that are developing mathematical understanding should look like. Contents Introduction 1 Number Concepts and Place Value 2 Word Problem Structures 3 Addition and Subtraction Using Counting Strategies 4 Addition and Subtraction Using Grouping Strategies 5 Geometry 6 Measurement Epilogue Next Steps Appendix
A Completed Classification of Triangles Chart Appendix B Completed Diagram for Classifying Quadrilaterals

The idea of teachers Learning through Teaching (LTT) – when presented to a naïve bystander – appears as an oxymoron. Are we not supposed to learn before we teach? After all, under the usual circumstances, learning is the task for those who are being taught, not of those who teach. However, this book is about the learning of teachers, not the learning of students. It is an ancient wisdom that the best way to “truly learn” something is to teach it to others. Nevertheless, once a teacher has taught a particular topic or concept and, consequently, “truly learned” it, what is left for this teacher to learn? As evident in this book, the experience of teaching presents teachers with an exciting opp- tunity for learning throughout their entire career. This means acquiring a “better” understanding of what is being taught, and, moreover, learning a variety of new things. What these new things may be and how they are learned is addressed in the collection of chapters in this volume. LTT is acknowledged by multiple researchers and mathematics educators. In the rst chapter, Leikin and Zazkis review literature that recognizes this phenomenon and stress that only a small number of studies attend systematically to LTT p- cesses. The authors in this volume purposefully analyze the teaching of mathematics as a source for teachers’ own learning. This book enables teachers to effectively meet the needs of their most able mathematicians. Using a tried and tested set of principles developed and used by The Able Children’s Education Unit at Brunel University, the author demonstrates how to: identify high mathematical ability in a pupil, plan suitably challenging activities and teach them most effectively within the existing National Numeracy framework, make the most of the classroom resources available, including ICT and external agencies, implement strategies for differentiation, illustrated with real-life classroom examples. Accessible in style and featuring practical case studies throughout, this book will give teachers and student teachers the confidence and knowledge to effectively challenge and develop the skills of the most able mathematician.

Rev. ed. of: Teaching mathematics to the learning disabled.

‘This is an outstanding book: it should be high on the list of any primary school teacher’s set of references and a required text for pre-service teachers.’

Australian Primary Mathematics Classroom In our technology-rich world, numeracy is just as important as the smartphone in your pocket. Students need to develop mathematical ways of seeing the world and strong problem-solving skills, and those foundations are taught in the primary school classroom. Teaching Mathematics in Primary Schools covers the mathematical content taught in primary and middle years, always emphasising how students can connect what they learn in mathematics with other curriculum areas and with the world beyond the classroom. The authors draw on the latest international research to show how teachers can develop a rich repertoire of classroom teaching techniques, and effective planning, assessment and reporting methods.
They outline approaches to creating supportive learning environments for all students, and to building their knowledge and confidence in using mathematics. This third edition has been updated throughout and includes a new chapter on numeracy. Evidence-based uses of digital technologies to support learning and teaching are included in every chapter. With practical strategies that can be implemented in the classroom, this book is an invaluable resource for pre-service and early career primary and middle years mathematics teachers.

This book presents an approach to the teaching of mathematics that departs radically from conventional prescription-oriented and management-based methods. It brings together recent developments in such diverse fields as continental and pragmatist philosophy, enactivist thought, critical discourses, cognitive theory, evolution, ecology, and mathematics, and challenges the assumptions that permeate much of mathematics teaching. The discussion focuses on the language used to frame the role of the teacher and is developed around the commonsense distinctions drawn between thought and action, subject and object, individual and collective, fact and fiction, teacher and student, and classroom tasks and real life. The discussion also addresses the question of how mathematics teaching can be reformed to better suit current academic and social climates. Making use of the theoretical framework of enactivism, the book explores the subject through an account of a middle school teacher's appreciation and understanding of her role. Teaching mathematics, as both the report of this teacher's experience and the discussion make clear, demands an embracing of ambiguity, uncertainty, complexity, and moral responsibility.

Courses for Adoption Education: Mathematics for Elementary Teachers, Methods for Teaching Elementary Schools, Methods for Teaching Secondary Schools, Curriculum Studies, Critical Pedagogy Special Features *Elucidates the importance and relationship between theory and practice. Employs reflective teaching techniques to focus students on their own learning, knowledge, and understanding of mathematics. Details a collaborative venture that traces the development of new thinking and insights about math teaching and learning. *A fine blending of theory with practice.

Packed with effective instructional strategies, this book explores why certain K-5 students struggle with math and provides a framework for helping these learners succeed. The authors present empirically validated practices for supporting students with disabilities and others experiencing difficulties in specific areas of math, including problem solving, early numeracy, whole-number operations, fractions, geometry, and algebra. Concrete examples, easy-to-implement lesson-planning ideas, and connections to state standards, in particular the Common Core standards, enhance the book's utility. Also provided is invaluable guidance on planning and delivering multi-tiered instruction and intervention.

With the composition of today's classroom in mind, this book approaches teaching and planning elementary mathematics by using methods that accommodate the diverse learning needs of any student having difficulties with basic math concepts. The authors use personal experience and research that supports a complete set of developmental concepts and skills to outline the effective development of mathematical concepts and skills. It stresses lesson planning that will result in learning, understanding, and retaining important concepts and skills.
K-12 Special Education and General Education Teachers.
Take the mystery out of teaching mathematics! This second edition resource is the perfect, research-supported tool to differentiate instruction. Full of practical strategies thoroughly described throughout the book, educators will be able to immediately implement best-practice instruction. Learn how curriculum can be extended, accelerated, and enriched for the new standards in mathematics and explore the reasons why the “new math” helps to develop critical-thinking skills and higher-order skills.

A practical introduction to Maths teaching designed specifically for beginning teachers in primary and secondary schools. It brings together the latest DfES and TTA guidelines and requirements with authoritative guidance, ensuring that readers feel confident about how to approach their role as a teacher. This book explores key issues in maths teaching today, including: planning and classroom management assessment, recording and reporting information and communication technology investigative mathematics equal opportunities, special needs and differentiation key skills and alternative mathematics qualifications being an effective maths teacher personal and professional development in the early stages of a teaching career.

This practical, engaging book explores the fundamentals of pedagogy and the unique challenges of teaching undergraduate mathematics not commonly addressed in most education literature. Professor and mathematician, Suzanne Kelton offers a straightforward framework for new faculty and graduate students to establish their individual preferences for course policy and content exposition, while alerting them to potential pitfalls. The book discusses the running of day-to-day class meetings and offers specific strategies to improve learning and retention, as well as concrete examples and effective tools for class discussion that draw from a variety of commonly taught undergraduate mathematics courses. Kelton also presents knowledge, resources, and examples for teachers working with students with special needs from Pre-K through secondary school. Key topics include: dyscalculia, what contemporary neuroscience tells us about mathematical learning, and differentiating assessment and instruction effectively to meet the needs of all students in an equitable framework.

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.

Now in an updated second edition Unlocking Mathematics is a comprehensive guide to teaching mathematics in the primary school.

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.

A resource book for Waldorf teachers which covers the Class 1 to 8 Steiner-Waldorf maths curriculum. Features include: " ... how arithmetic can be introduced effectively in the early years so you can start teaching with confidence ... Draws number work from everyday life to stimulate children's interest and enthusiasm ... Gives examples for you to devise your own exercises ... Indicates how mixed ability teaching can be improved ... Relates maths to other subjects and to children's development.”

First published in 1993. Routledge is an imprint of Taylor & Francis, an informa company.

Rich tasks, collaborative work, number talks, problem-based learning, direct instruction...with so many possible approaches, how do we know which ones work the best? In Visible Learning for Mathematics, six acclaimed educators assert it’s not about which one—it’s about when—and show you how to design high-impact instruction so all students demonstrate more than a year’s worth of mathematics learning for a year spent in school. That’s a high bar, but with the amazing K-12 framework here, you choose the right approach at the right time, depending upon where learners are within three phases of learning: surface, deep, and transfer. This results in “visible” learning because the effect is tangible. The framework is forged out of current research in mathematics combined with John Hattie’s synthesis of more than 15 years of education research involving 300 million students. Chapter by chapter, and equipped with video clips, planning tools, rubrics, and templates, you get the inside track on which instructional strategies to use at each phase of the learning cycle: Surface learning phase: When—through carefully constructed experiences—students explore new concepts and make connections to procedural skills and vocabulary that give shape to developing conceptual understandings. Deep learning phase: When—through the solving of rich high-cognitive tasks and rigorous discussion—students make connections among conceptual ideas, form mathematical generalizations, and apply and practice procedural skills with fluency. Transfer phase: When students can independently think through more complex mathematics, and can plan, investigate, and elaborate as they apply what they know to new mathematical situations. To equip students for higher-level mathematics learning, we have to be clear about where students are, where they need to go, and what it looks like when they get there. Visible Learning for Math brings about powerful, precision teaching for K-12 through intentionally designed guided, collaborative, and independent learning.

This book addresses the need of professional development leaders and policymakers for scholarly knowledge about influencing teachers to modify mathematical instruction to bring it more in alignment with the recommendations of the current reform movement initiated by the National Council of Teachers of Mathematics. The book presents: * theoretical perspectives for studying, analyzing, and understanding teacher change; * descriptions of contextual variables to be considered as one studies and attempts to understand teacher change; and * descriptions of professional development programs that resulted in teacher change. One chapter builds a rationale for looking to developmental psychology for guidance in constructing
models of reconstructing new forms of mathematical instruction. Another highlights the relevance to mathematics teacher development of research-based knowledge about how children construct mathematical ideas. Other chapters explore the relationships between the various contexts of schooling and instructional change. Included also are chapters that describe and analyze major reform efforts designed to assist teachers in modifying their instructional practices (Cognitively Guided Instruction, Math-Cubed, Project Impact, Mathematics in Context, and the Case-Based Project). Finally, the current state of knowledge about encouraging teachers to modify their instruction is discussed, the implications of major research and implementation findings are suggested, and some of the major questions that need to be addressed are identified, such as what we have learned about teacher change.

How to Teach Maths challenges everything you thought you knew about how maths is taught in classrooms. Award-winning author Steve Chinn casts a critical eye over many of the long-established methods and beliefs of maths teaching. Drawing from decades of classroom experience and research, he shows how mathematics teaching across the whole ability range can be radically improved by learning from the successful methods and principles used for the bottom quartile of achievers: the outliers. Chinn guides readers through re-adjusting the presentation of maths to learners, considering learners’ needs first, and explains the importance of securing early learning to create a conceptual foundation for later success. This highly accessible book uses clear diagrams and examples to support maths teachers through many critical issues, including the following: The context of maths education today Topics that cause students the most difficulty Effective communication in the mathematics classroom Addressing maths anxiety The perfect resource for maths teachers at all levels, this book is especially useful for those wanting to teach the foundations of mathematics in a developmental way to learners of all ages and abilities. It has the potential to change the way maths is taught forever.

"This book shares theoretical and applied pedagogical models and systems used in math e-learning including the use of computer supported collaborative learning, which is common to most e-learning practices"--Provided by publisher.

Written by an experienced teacher and teacher educator with widespread experience of teaching mathematics in the UK and internationally, Understanding and Teaching Primary Mathematics combines pedagogy and subject knowledge to build confidence and equip you with all the skills and know-how you need to successfully teach mathematics to children of any age. This 4th edition has been fully updated to reflect the latest research developments and initiatives in the field, including a brand-new chapter on ‘Mastery and mathematics’ and ‘The Singapore approach’ which reflects the current international interest in these approaches to learning and teaching mathematics. Extra features also include helpful callouts to the book’s revised and updated companion website, which offers a shared site with a range of resources relevant to both this book and its companion volume, Teaching for Mathematical Understanding. Stimulating, accessible and well-illustrated, with comprehensive coverage of subject knowledge and pedagogy, Understanding and Teaching Primary Mathematics is an essential purchase for trainee and practising teachers alike.

This expanded edition of the original bestseller, How to Teach Mathematics, offers hands-on guidance for teaching mathematics in the modern classroom setting. Twelve appendices have been added that are written by experts who have a wide range of opinions and viewpoints on the major teaching issues. Eschewing generalities, the award-winning author and teacher, Steven Krantz, addresses issues such as preparation, presentation, discipline, and grading. He also emphasizes specifics--from how to deal with students who beg for extra points on an exam to mastering blackboard technique to how to use applications effectively. No other contemporary book addresses the principles of good teaching in such a comprehensive and cogent manner. The broad appeal of this text makes it accessible to areas other than
mathematics. The principles presented can apply to a variety of disciplines—from music to English to business. Lively and humorous, yet serious and sensible, this volume offers readers incisive information and practical applications.

Online education has become a major component of higher education worldwide. In mathematics and statistics courses, there exists a number of challenges that are unique to the teaching and learning of mathematics and statistics in an online environment. These challenges are deeply connected to already existing difficulties related to math anxiety, conceptual understanding of mathematical ideas, communicating mathematically, and the appropriate use of technology. Teaching and Learning Mathematics Online bridges these issues by presenting meaningful and practical solutions for teaching mathematics and statistics online. It focuses on the problems observed by mathematics instructors currently working in the field who strive to hone their craft and share best practices with our professional community. The book provides a set of standard practices, improving the quality of online teaching and the learning of mathematics. Instructors will benefit from learning new techniques and approaches to delivering content. Features Based on the experiences of working educators in the field Assimilates the latest technology developments for interactive distance education Focuses on mathematical education for developing early mathematics courses Teaching Mathematics Online: Emergent Technologies and Methodologies

Develop a deep understanding of mathematics. This user-friendly resource presents grades 6–8 teachers with a logical progression of pedagogical actions, classroom norms, and collaborative teacher team efforts to increase their knowledge and improve mathematics instruction. Make connections between elementary fraction-based content to fraction operations taught in the middle grades. Explore strategies and techniques to effectively learn and teach significant mathematics concepts and provide all students with the precise, accurate information they need to achieve academic success. Benefits Dig deep into mathematical modeling and reasoning to improve as both a learner and teacher of mathematics. Explore how to develop, select, and modify mathematics tasks in order to balance cognitive demand and engage students. Discover the three important norms to uphold in all mathematics classrooms. Learn to apply the tasks, questioning, and evidence (TQE) process to grow as both learners and teachers of mathematics. Gain clarity about the most productive progression of mathematical teaching and learning for grades 6–8. Access short videos that show what classrooms that are developing mathematical understanding should look like. Contents Introduction 1 Fraction Operations and Integer Concepts and Operations 2 Ratios and Proportional Relationships 3 Equations, Expressions, and Inequalities 4 Functions 5 Measurement and Geometry 6 Statistics and Probability Epilogue: Next Steps References and Resources Index

This engaging book offers an in-depth introduction to teaching mathematics through problem-solving, providing lessons and techniques that can be used in classrooms for both primary and lower secondary grades. Based on the innovative and successful Japanese approaches of Teaching Through Problem-solving (TTP) and Collaborative Lesson Research (CLR), renowned mathematics education scholar Akihiko Takahashi demonstrates how these teaching methods can be successfully adapted in schools outside of Japan. TTP encourages students to try and solve a problem independently, rather than relying on the format of lectures and walkthroughs provided in classrooms across the world. Teaching Mathematics Through Problem-Solving gives educators the
tools to restructure their lesson and curriculum design to make creative and adaptive problem-solving the main way students learn new procedures. Takahashi showcases TTP lessons for elementary and secondary classrooms, showing how teachers can create their own TTP lessons and units using techniques adapted from Japanese educators through CLR. Examples are discussed in relation to the Common Core State Standards, though the methods and lessons offered can be used in any country. Teaching Mathematics Through Problem-Solving offers an innovative new approach to teaching mathematics written by a leading expert in Japanese mathematics education, suitable for pre-service and in-service primary and secondary math educators. The art of teaching math lies in the ability of the instructor to motivate and inspire individuals to look beyond the numbers and understand the concepts. This book is designed to revive this art, focusing more on the aspects of learning the ideas behind the math rather than the sheer mechanics of mathematical operation. This text addresses the art of teaching mathematics while also providing specific aids and activities in arithmetic, geometry, algebra and probability and statistics for use in the classroom. The authors pay close attention to the role, importance, methods and techniques of motivation. They present ideas that will generate attention, interest, and surprise among students, and will thus foster creative thinking. The material in the text is based on talks given by the authors at professional meetings, as well as the actual application of their ideas in undergraduate and graduate classes they taught. Additionally, many laboratory and discovery activities have been used by authors in teaching junior and senior high school math classes. Instructors of mathematics, school administrators, math specialists, and parents. This revised and updated third edition offers a range of strategies, activities and ideas to bring mathematics to life in the primary classroom. Taking an innovative and playful approach to maths teaching, this book promotes creativity as a key element of practice and offers ideas to help your students develop knowledge, understanding and enjoyment of the subject. In the creative classroom, mathematics becomes a tool to build confidence, develop problem solving skills and motivate children. The fresh approaches explored in this book include a range of activities such as storytelling, music and construction, elevating maths learning beyond subject knowledge itself to enable students to see mathematics in a new way. Key chapters of this book explore: • Learning maths outdoors - make more noise, make more mess or work on a larger scale • Everyday maths - making sense of the numbers, patterns, shapes and measures children see around them • Music and maths – the role of rhythm in learning, and music and pattern in maths Stimulating, accessible and underpinned by the latest research and theory, this is essential reading for trainee and practising teachers who wish to embed creative approaches to maths teaching in their classroom. Teaching Mathematics is nothing less than a mathematical manifesto. Arising in response to a limited National Curriculum, and engaged with secondary schooling for those aged 11 ? 14 (Key Stage 3) in particular, this handbook for teachers will help them broaden and enrich their students’ mathematical education. It avoids specifying how to teach, and focuses instead on the central principles and concepts that need to be borne in mind by all teachers and textbook authors—but which are little appreciated in the UK at present. This study is aimed at anyone who would like to think more deeply about the discipline of ‘elementary mathematics’, in England and Wales and anywhere
Progress in mathematics frequently occurs first by studying particular examples and then by generalizing the patterns that have been observed into far-reaching theorems. Similarly, in teaching mathematics one often employs examples to motivate a general principle or to illustrate its use. This volume uses the same idea in the context of learning how to teach: By analyzing particular teaching situations, one can develop broadly applicable teaching skills useful for the professional mathematician. These teaching situations are the Case Studies of the title. Just as a good mathematician seeks both to understand the details of a particular problem and to put it in a broader context, the examples presented here are chosen to offer a serious set of detailed teaching issues and to afford analysis from a broad perspective. Each case raises a variety of pedagogical and communication issues that may be explored either individually or in a group facilitated by a faculty member. The methodology of Case Studies is widely used in areas such as business and law. The consideration of the mathematics cases presented here will help readers to develop teaching skills for their own classrooms. See the faculty edition at Teaching Mathematics in Colleges and Universities: Case Studies for Today’s Classroom: Faculty Edition

Your game plan for unlocking mathematics by focusing on students’ strengths. What if instead of focusing on what students haven’t mastered, we identify their mathematical strengths and build on students’ points of power? Beth McCord Kobett and Karen S. Karp highlight five key teaching turnarounds are presented: identify teaching strengths, leverage students’ strengths, design instruction from a strengths-based perspective, help students identify their points of power, and promote strengths in the school community. Each chapter provides opportunities to reflect and transfer practice while also sharing · Downloadable resources, activities, and tools · Examples of student work within Grades K–6 · Real teachers’ notes and reflections for discussion

Empower students to be the change—join the teaching mathematics for social justice movement! We live in an era in which students have —through various media and their lived experiences— a more visceral experience of social, economic, and environmental injustices. However, when people think of social justice, mathematics is rarely the first thing that comes to mind. Through model lessons developed by over 30 diverse contributors, this book brings seemingly abstract high school mathematics content to life by connecting it to the issues students see and want to change in the world. Along with expert guidance from the lead authors, the lessons in this book explain how to teach mathematics for self- and community-empowerment. It walks teachers step-by-step through the process of using mathematics—across all high school content domains—as a tool to explore, understand, and respond to issues of social injustice including: environmental injustice; wealth inequality; food insecurity; and gender, LGBTQ, and racial discrimination. This book features: Content cross-referenced by mathematical concept and social issues Downloadable instructional materials for student use User-friendly and logical interior design for daily use Guidance for designing and implementing social justice lessons driven by your own students’ unique
passions and challenges Timelier than ever, teaching mathematics through the lens of social justice will connect content to students’ daily lives, fortify their mathematical understanding, and expose them to issues that will make them responsive citizens and leaders in the future.

Today’s mathematics classrooms increasingly include students for whom English is a second language. Teaching Mathematics to English Language Learners provides readers a comprehensive understanding of both the challenges that face English language learners (ELLs) and ways in which educators might address them in the secondary mathematics classroom. Framed by a research perspective, Teaching Mathematics to English Language Learners presents practical instructional strategies for engaging learners that can be incorporated as a regular part of instruction. The authors offer context-specific strategies for everything from facilitating classroom discussions with all students, to reading and interpreting math textbooks, to tackling word problems. A fully annotated list of math web and print resources completes the volume, making this a valuable reference to help mathematics teachers meet the challenges of including all learners in effective instruction. Features and updates to this new edition include: An updated and streamlined Part 1 provides an essential overview of ELL theory in a mathematics specific context. Additional practical examples of mathematics problems and exercises make turning theory into practice easy when teaching ELLs New pedagogical elements in Part 3 include tips on harnessing new technologies, discussion questions and reflection points. New coverage of the Common Core State Standards, as well as updates to the web and print resources in Part 4.

A compendium of more than 240 classroom-tested lessons, this essential resource helps teachers build student understanding and skills and understand how children best learn math. In this third edition, Marilyn Burns has completely revised the first section to reflect what she has learned over the years from her classroom experience with students and her professional development experience with teachers. This section has also been expanded to address these important topics: teaching math vocabulary, incorporating writing into math instruction, linking assessment and instruction, and using children’s literature to teach key math concepts. In an entirely new section, Marilyn addresses a wide range of questions she has received over the years from elementary and middle school teachers regarding classroom management and instructional issues. Using strengths-based approaches to support development in mathematics It’s time to re-imagine what’s possible and celebrate the brilliance multilingual learners bring to today’s classrooms. Innovative teaching strategies can position these learners as leaders in mathematics. Yet, as the number of multilingual learners in North American schools grows, many teachers have not had opportunities to gain the competencies required to teach these learners effectively, especially in disciplines such as mathematics. Multilingual learners—historically called English Language Learners—are expected to interpret
the meaning of problems, analyze, make conjectures, evaluate their progress, and discuss and understand their own approaches and the approaches of their peers in mathematics classrooms. Thus, language plays a vital role in mathematics learning, and demonstrating these competencies in a second (or third) language is a challenging endeavor. Based on best practices and the authors’ years of research, this guide offers practical approaches that equip grades K-8 teachers to draw on the strengths of multilingual learners, partner with their families, and position these learners for success. Readers will find: • A focus on multilingual students as leaders • A strength-based approach that draws on students’ life experiences and cultural backgrounds • An emphasis on maintaining high expectations for learners’ capacity for mastering rigorous content • Strategies for representing concepts in different formats • Stop and Think questions throughout and reflection questions at the end of each chapter • Try It! Implementation activities, student work examples, and classroom transcripts With case studies and activities that provide a solid foundation for teachers’ growth and exploration, this groundbreaking book will help teachers and teacher educators engage in meaningful, humanized mathematics instruction.

Develop a deep understanding of mathematics. This user-friendly resource presents grades 3–5 teachers with a logical progression of pedagogical actions, classroom norms, and collaborative teacher team efforts to increase their knowledge and improve mathematics instruction. Focus on an understanding of and procedural fluency with multiplication and division. Address how to learn and teach fraction concepts and operations with depth. Thoroughly teach plane and solid geometry. Explore strategies and techniques to effectively learn and teach significant mathematics concepts and provide all students with the precise, accurate information they need to achieve academic success. Benefits Dig deep into mathematical modeling and reasoning to improve as both a learner and teacher of mathematics. Explore how to develop, select, and modify mathematics tasks in order to balance cognitive demand and engage students. Discover the three important norms to uphold in all mathematics classrooms. Learn to apply the tasks, questioning, and evidence (TQE) process to ensure mathematics instruction is focused, coherent, and rigorous. Use charts and diagrams for classifying shapes, which can engage students in important mathematical practices. Access short videos that show what classrooms that are developing mathematical understanding should look like. Contents Introduction 1 Place Value, Addition, and Subtraction 2 Multiplication and Division 3 Fraction Concepts 4 Fraction Operations 5 Geometry 6 Measurement Epilogue Next Steps Appendix A Completed Classification of Triangles Chart Appendix B Completed Diagram for Classifying Quadrilaterals Make Rich Math Instruction Come to Life Online In an age when distance learning has become part of the "new normal," educators know that rich remote math teaching involves more than direct instruction, online videos, and endless
practice problems on virtual worksheets. Using both personal experience and those of teachers in real K-12 online classrooms, distance learning mathematics veteran Theresa Wills translates all we know about research-based, equitable, rigorous face-to-face mathematics instruction into an online venue. This powerful guide equips math teachers to: Build students’ agency, identity, and strong math communities Promote mathematical thinking, collaboration, and discourse Incorporate rich mathematics tasks and assign meaningful homework and practice Facilitate engaging online math instruction using virtual manipulatives and other concrete learning tools Recognize and address equity and inclusion challenges associated with distance learning Assess mathematics learning from a distance With examples across the grades, links to tutorials and templates, and space to reflect and plan, Teaching Math at a Distance offers the support, clarity, and inspiration needed to guide teachers through teaching math remotely without sacrificing deep learning and academic growth.

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