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Contemporary Intellectual Assessment, Fourth Edition - Dawn P. Flanagan 2018-07-23 This leading practitioner reference and text--now in a revised and expanded fourth edition--provides the knowledge needed to use state-of-the-art cognitive tests with individuals of all ages, from preschoolers to adults. The volume examines major theories and tests of intelligence (in chapters written by the theorists and test developers themselves) and presents research-based approaches to test interpretation. Contributors address critical issues in evaluating culturally and linguistically diverse students, gifted students, and those with intellectual disability, sensory–motor impairments, traumatic brain injuries, and learning difficulties and disabilities. The fourth edition highlights the use of cognitive test results in planning school-based interventions. New to This Edition *Complete coverage of new or updated tests: WPPSI-IV, WISC-V, WISC-V Integrated, WJ IV, ECAD, CAS2, RIAS-2, KABC-II Normative Update, and UNIT2. *Chapters on cutting-edge approaches to identifying specific learning disabilities and reading disorders. *Chapters on brain imaging, neuropsychological intervention in schools, adult intellectual development, and DSM-5 criteria for learning disorders. *Updated chapters on theories of intelligence, their research base, and their clinical utility in guiding cognitive and neuropsychological assessment practice.

Writing in Math Class - Marilyn Burns 1995 Arguing that students should be writing in math class, the author describes five types of writing assignments for math and presents student work to illustrate her approach and suggestions and tips for teachers.

Mathematical Mindsets - Jo Boaler 2015-10-12 Banish math anxiety and give students of all ages a clear roadmap to success Mathematical Mindsets provides practical strategies and activities to help teachers and parents show all children, even those who are convinced that they are bad at math, that they can enjoy and succeed in math. Jo Boaler—Stanford researcher, professor of math education, and expert on math learning—has studied why students don't like math and often fail in math classes. She's followed thousands of students through middle and high schools to study how they learn and to find the most effective ways to unleash the math potential in all students. There is a clear gap between what research has shown to work in teaching math and what happens in schools and at home. This book bridges that gap by turning research findings into practical activities and advice. Boaler translates Carol Dweck's concept of 'mindset' into math teaching and parenting

strategies, showing how students can go from self-doubt to strong self-confidence, which is so important to math learning. Boaler reveals the steps that must be taken by schools and parents to improve math education for all. Mathematical Mindsets: Explains how the brain processes mathematics learning Reveals how to turn mistakes and struggles into valuable learning experiences Provides examples of rich mathematical activities to replace rote learning Explains ways to give students a positive math mindset Gives examples of how assessment and grading policies need to change to support real understanding Scores of students hate and fear math, so they end up leaving school without an understanding of basic mathematical concepts. Their evasion and departure hinders math-related pathways and STEM career opportunities. Research has shown very clear methods to change this phenomena, but the information has been confined to research journals—until now. Mathematical Mindsets provides a proven, practical roadmap to mathematics success for any student at any age.

Enriching Your Math Curriculum - Lainie Schuster 2010

"Presents practices and routines designed to support and nourish teachers as they prepare and present a meaningful year of mathematics instruction for fifth-grade mathematicians. Offers activities, lessons, and narration that can be easily adapted or adjusted to fit the particular needs of the students or the requirements of a prescribed curriculum"--

Welcome to Math Class - Marilyn S. Burns 2022-05-27

Welcome to Math Classfeatures 16 favorite lessons from Marilyn Burns, one of today's most highly respected mathematics educators. In this specially compiled collection, Marilyn shares lessons that have weathered the test of time and become permanent parts of her teaching repertoire. The Lessons Presented as stories, Marilyn's signature vignettes describe classroom-tested lessons and reveal both the preparing and planning helpful for instruction, as well as: address a broad range of math content, some focusing on number and operations while others engaging students with geometry, algebraic thinking, probability, and more; provide a detailed look at how lessons unfolded in actual classrooms, including how students responded and examples of students' written work; are presented in sections to make it easier for you to translate them into your own teaching plans; and describe how to organize instruction to maximize students' opportunities to verbalize and clarify their ideas and also listen to and learn from each other. The Audio Segments Included with the lessons is online access to nine audio segments titled "Conversations with Marilyn." In each segment, Marilyn, joined by longtime Math Solutions colleague Patty Clark, talks about teaching math. The conversations focus on topics that range from "What Makes a Good Problem?" to "The Meaning of Math Menus." Consider them your personal conversations, meant to support you further as you plan to use the lessons with your students. The Reproducibles When appropriate, lessons include accompanying reproducibles, available in a downloadable, printable format to support your use of this resource.

Math-positive Mindsets - Carrie S. Cutler 2019

Principles to Actions - National Council of Teachers of Mathematics 2014-02

This text offers guidance to teachers, mathematics coaches, administrators, parents, and policymakers. This book: provides a research-based description of eight essential mathematics teaching practices ; describes the conditions, structures, and policies that must support the teaching practices ; builds on NCTM's Principles and Standards for School Mathematics and supports implementation of the Common Core State Standards for Mathematics to attain much higher levels of mathematics achievement for all students ; identifies obstacles, unproductive and productive beliefs, and key actions that must be understood, acknowledged, and addressed by all stakeholders ; encourages teachers of mathematics to engage students in mathematical thinking, reasoning, and sense making to significantly strengthen teaching and learning.

Making Number Talks Matter - Cathy Humphreys 2015

Making Number Talks Matter is about the myriad decisions facing teachers as they make this fifteen-minute daily routine a vibrant and

vital part of their mathematics instruction. Throughout the book, Cathy Humphreys and Ruth Parker offer practical ideas for using Number Talks to help students learn to reason numerically and build a solid foundation for the study of mathematics. This book will be an invaluable resource whether you are already using Number Talks or not; whether you are an elementary, middle school, high school, or college teacher; or even if you are a parent wanting to support your child with mathematics. Using insight gained from many years of doing Number Talks with students of all ages, Cathy and Ruth address questions to ask during Number Talks, teacher moves that turn the thinking over to students, the mathematics behind the various strategies, and ways to overcome bumps in the road. If you've been looking for ways to transform your mathematics classroom--to bring sense-making and divergent thinking to the foreground, to bring the Standards for Mathematical Practice to life, and to bring joy back into your instruction--this book is for you.

Essentials of WJ IV Cognitive Abilities Assessment - Fredrick A. Schrank 2016-03-16

The step-by-step guide to administering, scoring, and interpreting the WJ IV® Tests of Cognitive Abilities Essentials of WJ IV® Cognitive Abilities Assessment provides expert, practical advice on how to administer, score, and interpret the WJ IV COG®. Designed to be an easy-to-use reference, the text goes beyond the information found in the WJ IV® examiner's manual to offer full explanations of the tests and clusters on the WJ IV COG®. This essential guide also explains the meaning of all scores and interpretive features and includes valuable advice on clinical applications and illuminating case studies. This clearly written and easily accessible resource offers: Concise chapters with numerous callout boxes highlighting key concepts, numerous examples, and test questions that help you gauge and reinforce your grasp of the information covered. An in-depth chapter on interpretation of the WJ IV COG® which highlights links to interventions for each test based on contemporary theory and research. Expert assessment of the tests' relative strengths and weaknesses. Illustrative case reports with clinical and school-based populations. If you're a school psychologist, clinical psychologist, neuropsychologist, or any professional or graduate student looking to become familiar with the new WJ IV COG®, this is the definitive resource you'll turn to again and again.

Classroom-Ready Number Talks for Kindergarten, First and Second Grade Teachers - Nancy Hughes 2019-02-26

A wide variety of ready-to-use number talks that help kindergarten through second-grade students learn math concepts in fun and easy ways. Bringing the exciting teaching method of number talks into your classroom has never been easier. Simply choose from the hundreds of great ideas in this book and get going! From activities on addition and subtraction to fractions and decimals, Classroom-Ready Number Talks for Kindergarten, First and Second Grade Teachers includes: Grade-level specific strategies Number talk how-tos Visual and numerical examples Scaffolding suggestions Common core alignments Questions to build understanding Reduce time spent lesson-planning and preparing materials and enjoy more time engaging your students in learning important math concepts! These ready-to-use number talks are sure to foster a fresh and exciting learning environment in your classroom, as well as help your students increase their comprehension of numbers and mathematical principles.

Introduction to Probability - Joseph K. Blitzstein 2014-07-24

Developed from celebrated Harvard statistics lectures, Introduction to Probability provides essential language and tools for understanding statistics, randomness, and uncertainty. The book explores a wide variety of applications and examples, ranging from coincidences and paradoxes to Google PageRank and Markov chain Monte Carlo (MCMC). Additional

The Next Step - James Freemyer 2019-09-10

This book is written on the behalf of mathematics teachers who have been asked to teach more conceptually while simultaneously motivating more students of all ability levels to willingly embrace further upper level mathematics content and courses. This is a BIG ASK! Math teachers are being expected to overhaul their current teaching approach. Can

teachers be expected to embrace this crusade alone, isolated in a classroom? Principals are charged with leading the way. They must provide the opportunities and resources necessary for effective teacher collaboration. After reading this book, a principal will comprehend the enormity of task each mathematics teachers faces and learn what must be done to help. School leaders will be able to design a growth plan based on a plethora of collaborative approaches. Mathematics teachers will experience the assistance they have desperately needed.

Developing Mathematical Literacy Through Adolescent Literature - Paula Greathouse 2022-01-15

Students are offered opportunities to explore multiple mathematical topics such as probabilities, statistics, linear equations, integers, and sequencing, as well as algebra, pre-calculus and calculus concepts through literature. As students develop mathematical literacy, they will also explore literary elements such as characterization, setting, and conflict.

Figuring Out Fluency in Mathematics Teaching and Learning, Grades K-8 - Jennifer M. Bay-Williams 2021-03-11

Because fluency practice is not a worksheet. Fluency in mathematics is more than adeptly using basic facts or implementing algorithms. Real fluency involves reasoning and creativity, and it varies by the situation at hand. Figuring Out Fluency in Mathematics Teaching and Learning offers educators the inspiration to develop a deeper understanding of procedural fluency, along with a plethora of pragmatic tools for shifting classrooms toward a fluency approach. In a friendly and accessible style, this hands-on guide empowers educators to support students in acquiring the repertoire of reasoning strategies necessary to becoming versatile and nimble mathematical thinkers. It includes: "Seven Significant Strategies" to teach to students as they work toward procedural fluency. Activities, fluency routines, and games that encourage learning the efficiency, flexibility, and accuracy essential to real fluency. Reflection questions, connections to mathematical standards, and techniques for assessing all components of fluency. Suggestions for engaging families in understanding and supporting fluency. Fluency is more than a toolbox of strategies to choose from; it's also a matter of equity and access for all learners. Give your students the knowledge and power to become confident mathematical thinkers.

Constructing Number - Anderson Norton 2018-12-17

The book synergizes research on number across two disciplines—mathematics education and psychology. The underlying problem the book addresses is how the brain constructs number. The opening chapter frames the problem in terms of children's activity, including mental and physical actions. Subsequent chapters are organized into sections that address specific domains of number: natural numbers, fractions, and integers. Chapters within each section address ways that children build upon biological primitives (e.g., subitizing) and prior constructs (e.g., counting sequences) to construct number. The book relies on co-authored chapters and commentaries at the end of each section to create dialogue between junior faculty and senior researchers, as well as between psychologists and mathematics educators. The final chapter brings this work together around the framework of children's activity and additional themes that arise in the collective work. The book is aimed to appeal to mathematics educators, mathematics teacher educators, mathematics education researchers, educational psychologists, cognitive psychologists, and developmental psychologists.

The Myth of Ability - John Mighton 2009-05-26

For decades teachers and parents have accepted the judgment that some students just aren't good at math. John Mighton-the founder of a revolutionary math program designed to help failing math students-feels that not only is this wrong, but that it has become a self-fulfilling prophecy. A pioneering educator, Mighton realized several years ago that children were failing math because they had come to believe they were not good at it. Once students lost confidence in their math skills and fell behind, it was very difficult for them to catch up, particularly in the classroom. He knew this from experience, because he had once failed math himself. Using the premise that anyone can learn math and anyone can teach it, Mighton's unique teaching method isolates and describes concepts

so clearly that students of all skill levels can understand them. Rather than fearing failure, students learn from and build on their own successes and gain the confidence and self-esteem they need to be inspired to learn. Mighton's methods, set forth in The Myth of Ability and implemented in hundreds of Canadian schools, have had astonishing results: Not only have they helped children overcome their fear of math, but the resulting confidence has led to improved reading and motor skills as well. The Myth of Ability will transform the way teachers and parents look at the teaching of mathematics and, by extension, the entire process of education.

It Makes Sense! - Melissa Conklin 2010

"Ten-frames are a model to help students efficiently gain and develop an understanding of addition and subtraction. The classroom-tested routines, games, and problem-solving lessons in this book use ten-frames to develop students' natural strategies for adding numbers and fit into any set of state standards or curriculum"--Provided by publisher.

Intentional Talk - Elham Kazemi 2014

Not all mathematics discussions are alike. It's one thing to ask students to share how they solved a problem, to get ideas out on the table so that their thinking becomes visible; but knowing what to do with students' ideas--where to go with them--can be a daunting task. Intentional Talk provides teachers with a framework for planning and facilitating purposeful mathematics discussions that enrich and deepen student learning. According to Elham Kazemi and Allison Hintz, the critical first step is to identify a discussion's goal and then understand how to structure and facilitate the conversation to meet that goal. Through detailed vignettes from both primary and upper elementary classrooms, the authors provide a window into what teachers are thinking as they lead discussions and make important pedagogical and mathematical decisions along the way. Additionally, the authors examine students' roles as both listeners and talkers and, in the process, offer a number of strategies for improving student participation and learning. A collection of planning templates included in the appendix helps teachers apply the right structure to discussions in their own classrooms. Intentional Talk provides the perfect bridge between student engagement and conceptual understanding in mathematical discussions.

Number Sense Routines - Jessica F. Shumway 2018

Upper elementary teachers have a big job: to help students deepen their mathematical understanding and become more efficient mathematicians. Number Sense Routines: Developing Mathematical Understanding Every Day in Grades 3-5 is about tapping into every child's innate number sense and providing daily, connected experiences that are responsive to children's learning needs. Through familiar five-, ten-, or fifteen-minute warm-up routines, author Jessica Shumway offers both beginner and veteran teachers easy and effective ways to build and solidify students' number sense foundations. No matter how familiar the routine, Jessica infuses each with new joy, depth, and life. She reveals the careful thinking and planning that goes into each routine and provides detailed vignettes and dialogues of how they unfold in real classrooms. She gives teachers a clear view into her nuanced facilitation. Each routine becomes an exciting opportunity to understand where students are in their understanding and to help students articulate and extend their mathematical thinking. Not only will these routines help develop students' mathematical understanding as they move towards using standard algorithms, but teachers will learn to better recognize the big ideas that emerge in discussions, how to encourage important strategies based in number sense, and how to facilitate discussions on key mathematical concepts.

Classroom-Ready Number Talks for Sixth, Seventh, and Eighth Grade Teachers - Nancy Hughes 2020-03-31

Make math class fun with this big book of number talk strategies designed to teach middle school students the mental math, problem-solving skills they need to meet common core standards and become successful mathematical thinkers. Bringing the exciting teaching method of number talks into your classroom has never been easier. Simply choose from the hundreds of great ideas in this book and get going, with no extra time wasted! From activities on multiplication and division to decimals and

integers, Classroom-Ready Number Talks for Sixth, Seventh, and Eighth Grade Teachers includes: Grade-level specific strategies Number talk how-tos Visual and numerical examples Scaffolding suggestions Common core alignments Questions to build understanding Reduce time spent lesson planning and preparing materials and enjoy more time engaging your students in learning important math concepts! These ready-to-use number talks are sure to foster a fresh and exciting learning environment in your classroom.

Beyond Answers - Michael Flynn 2017

Shares ideas on how best to implement the Standards for Mathematical Practice in K-2 classrooms.

Classroom-Ready Number Talks for Third, Fourth and Fifth Grade Teachers - Nancy Hughes 2018-03-12

A huge collection of ready-to-use number talks that make math concepts easier for students to learn. Whether you're new to number talks or have been using them in your classroom for years, this book makes it easier than ever for your students to experience this exciting teaching method. Instead of trying to come up with a new number talk every day, simply select one of the hundreds of great offerings provided in this book. With chapters on addition, subtraction, multiplication, division, fractions and decimals, Classroom-Ready Number Talks for 3rd, 4th and 5th Grade Teachers includes: • Grade-level specific strategies • Number talk how-tos • Visual and numerical examples • Scaffolding suggestions • Common core alignments • Questions to build understanding With these ready-to-use number talks, you'll reduce time spent lesson-planning and enjoy more time discussing math with your students. It's sure to create a more engaging environment in your classroom and increase student comprehension of math concepts and how numbers function in the world around them.

Planning the Primary National Curriculum - Keira Sewell 2021-04-21

A complete guide for trainees and teachers To prepare to teach the new Primary National Curriculum, you need more than just the Programmes of Study. You need a resource to help you understand, plan for, teach and assess the curriculum. This is it! Your guide to planning the Primary National Curriculum. This book explores how to plan in primary schools. It covers curriculum design and structure, challenges to learning, and how children learn. New in this edition is a piece on Decolonising the Curriculum. For each curriculum subject the programme of study is included, with notes to help you interpret it for your own class. The text covers how the teaching of each subject can be organised, assessment opportunities, key and essential resources in each subject, and how ICT can best be used in each subject to enhance teaching. Sequenced lesson examples in all subject chapters link theory to practice and highlight progression. The final section of the book explores the many ways in which the curriculum can be delivered. It includes the creative curriculum, dialogic teaching, cross-curricular learning and more current thinking about interpreting the curriculum.

How People Learn - National Research Council 2000-08-11

First released in the Spring of 1999, How People Learn has been expanded to show how the theories and insights from the original book can translate into actions and practice, now making a real connection between classroom activities and learning behavior. This edition includes far-reaching suggestions for research that could increase the impact that classroom teaching has on actual learning. Like the original edition, this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do-with curricula, classroom settings, and teaching methods--to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. How People Learn examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly

entrenched in our current education system. Topics include: How learning actually changes the physical structure of the brain. How existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and opportunities for teachers. A realistic look at the role of technology in education.

Handbook of Research on Transforming Teachers' Online Pedagogical Reasoning for Engaging K-12 Students in Virtual Learning - Niess, Margaret L. 2021-06-25

The COVID-19 pandemic drastically transformed the classroom by keeping students and teachers apart for the sake of safety. As schools emptied, remote learning rapidly expanded through online services and video chatrooms. Unfortunately, this disrupted many students and teachers who were not accustomed to remote classrooms. This challenge has forced K-12 teachers to think differently about teaching. Unexpectedly and with little time to prepare, they have been confronted with redesigning their curriculum and instruction from face-to-face to online virtual classrooms to protect students from the COVID-19 virus while ensuring that these new online initiatives remain sustainable and useful in the post-pandemic world. As teachers learn to take advantage of the affordances and strengths of the multiple technologies available for virtual classroom instruction, their instruction both in online and face-to-face will impact what and how students learn in the 21st century. The Handbook of Research on Transforming Teachers' Online Pedagogical Reasoning for Engaging K-12 Students in Virtual Learning examines the best practices and pedagogical reasoning for designing online strategies that work for K-12 virtual learning. The initial section provides foundational pedagogical ideas for constructing engaging virtual learning environments that leverage the unique strengths and opportunities while avoiding the weaknesses and threats of the online world. The following chapters present instructional strategies for multiple grade levels and content areas: best practices that work, clearly describing why they work, and the teachers' pedagogical reasoning that supports online implementations. The chapters provide ways to think about teaching in virtual environments that can be used to guide instructional strategy choices and recognizes the fundamental differences between face-to-face and virtual environments as an essential design component. Covering such topics as K-12 classrooms, pedagogical reasoning, and virtual learning, this text is perfect for professors, teachers, students, educational designers and developers, instructional technology faculty, distance learning faculty, and researchers interested in the subject.

PISA Take the Test Sample Questions from OECD's PISA Assessments - OECD 2009-02-02

This book presents all the publicly available questions from the PISA surveys. Some of these questions were used in the PISA 2000, 2003 and 2006 surveys and others were used in developing and trying out the assessment.

Helping Children Learn Mathematics - National Research Council 2002-07-31

Results from national and international assessments indicate that school children in the United States are not learning mathematics well enough. Many students cannot correctly apply computational algorithms to solve problems. Their understanding and use of decimals and fractions are especially weak. Indeed, helping all children succeed in mathematics is an imperative national goal. However, for our youth to succeed, we need to change how weâ€™re teaching this discipline. Helping Children Learn Mathematics provides comprehensive and reliable information that will guide efforts to improve school mathematics from pre--kindergarten through eighth grade. The authors explain the five strands of mathematical proficiency and discuss the major changes that need to be made in mathematics instruction, instructional materials, assessments, teacher education, and the broader educational system and answers some of the frequently asked questions when it comes to mathematics instruction. The book concludes by providing recommended actions for parents and caregivers, teachers, administrators, and policy makers, stressing the importance that everyone work together to ensure a mathematically literate society.

Number Sense Routines - Jessica F. Shumway 2011

Just as athletes stretch their muscles before every game and musicians play scales to keep their technique in tune, mathematical thinkers and problem solvers can benefit from daily warm-up exercises. Jessica Shumway has developed a series of routines designed to help young students internalize and deepen their facility with numbers. The daily use of these quick five-, ten-, or fifteen-minute experiences at the beginning of math class will help build students' number sense. Students with strong number sense understand numbers, ways to represent numbers, relationships among numbers, and number systems. They make reasonable estimates, compute fluently, use reasoning strategies (e.g., relate operations, such as addition and subtraction, to each other), and use visual models based on their number sense to solve problems. Students who never develop strong number sense will struggle with nearly all mathematical strands, from measurement and geometry to data and equations. In Number Sense Routines, Jessica shows that number sense can be taught to all students. Dozens of classroom examples -- including conversations among students engaging in number sense routines -- illustrate how the routines work, how children's number sense develops, and how to implement responsive routines. Additionally, teachers will gain a deeper understanding of the underlying math -- the big ideas, skills, and strategies children learn as they develop numerical literacy.

Young Mathematicians at Work - Catherine Twomey Fosnot 2001

Explains how children between the ages of four and eight construct a deep understanding of numbers and the operations of addition and subtraction.

The SAGE Encyclopedia of Lifespan Human Development - Marc H. Bornstein 2018-01-15

Lifespan human development is the study of all aspects of biological, physical, cognitive, socioemotional, and contextual development from conception to the end of life. In approximately 800 signed articles by experts from a wide diversity of fields, The SAGE Encyclopedia of Lifespan Human Development explores all individual and situational factors related to human development across the lifespan. Some of the broad thematic areas will include: Adolescence and Emerging Adulthood Aging Behavioral and Developmental Disorders Cognitive Development Community and Culture Early and Middle Childhood Education through the Lifespan Genetics and Biology Gender and Sexuality Life Events Mental Health through the Lifespan Research Methods in Lifespan Development Speech and Language Across the Lifespan Theories and Models of Development. This five-volume encyclopedia promises to be an authoritative, discipline-defining work for students and researchers seeking to become familiar with various approaches, theories, and empirical findings about human development broadly construed, as well as past and current research.

Joyful Math - Deanna Pecaski McLennan 2020

"This book is about how to create invitations for young children to play with math ideas through art, literacy, and outdoor play. The focus of her book is really on math that occurs OUTSIDE of math time. How can we create space for children to play in our classrooms that builds on their own questions as well as the math they are studying in the curriculum? How can we create a joyful and playful space for math so that children feel like mathematical thinkers with valuable ideas from the very start? How can we create connections between math and children's lives so that they see math as creative and purposeful instead of just learning "school math"?"--

Moving Math - Mary Fiore 2017-10-17

Focus on “moving” the teaching and learning of mathematics by shifting instruction and assessment practices. This unique book uses critical thinking skills — inferring and interpreting, analyzing, evaluating, making connections, synthesizing, reasoning and proving, and reflecting — to help students make sense of mathematical concepts and support numeracy.

Number Talks - Sherry Parrish 2010

"This resource supports new and experienced educators who want to prepare for and design purposeful number talks for their students; the author demonstrates how to develop grade-level-specific strategies for addition, subtraction, multiplication, and division. Includes

connections to national standards, a DVD, reproducibles, bibliography, and index"--Provided by publisher.

Mathematics as the Science of Patterns - Patrick M. Jenlink 2022-02-01

Mathematics as the Science of Patterns: Making the Invisible Visible to Students through Teaching introduces the reader to a collection of thoughtful, research-based works by authors that represent current thinking about mathematics, mathematics education, and the preparation of mathematics teachers. Each chapter focuses on mathematics teaching and the preparation of teachers who will enter classrooms to instruct the next generation of students in mathematics. The value of patterns to the teaching and learning of mathematics is well understood, both in terms of research and application. When we involve or appeal to pattern in teaching mathematics, it is usually because we are trying to help students to extract greater meaning, or enjoyment, or both, from the experience of learning environments within which they are occupied, and perhaps also to facilitate remembering. As a general skill it is thought that the ability to discern a pattern is a precursor to the ability to generalize and abstract, a skill essential in the early years of learning and beyond. Research indicates that the larger problem in teaching mathematics does not lie primarily with students; rather it is with the teachers themselves. In order to make changes for students there first needs to be a process of change for teachers. Understanding the place of patterns in learning mathematics is a predicate to understanding how to teach mathematics and how to use pedagogical reasoning necessary in teaching mathematics. Importantly, the lack of distinction created by the pedagogical use of patterns is not immediately problematic to the student or the teacher. The deep-seated cognitive patterns that both teachers and students bring to the classroom require change. Chapter 1 opens the book with a focus on mathematics as the science of patterns and the importance of patterns in mathematical problem solving, providing the reader with an introduction. The authors of Chapter 2 revisit the work of Po lya and the development and implementation of problem solving in mathematics. In Chapter 3, the authors present an argument for core pedagogical content knowledge in mathematics teacher preparation. The authors of Chapter 4 focus on preservice teachers' patterns of conception as related to understanding number and operation. In Chapter 5 the authors examine the role of visual representation in exploring proportional reasoning, denoting the importance of helping learners make their thinking visible. The authors of Chapter 6 examine patterns and relationships, and the importance of each in assisting students' learning and development in mathematical understanding. The authors of Chapter 7 examine the use of worked examples as a scalable practice, with emphasis on the importance of worked examples in teaching fraction magnitude and computation is discussed. In Chapter 8, the authors expand on the zone of proximal development to investigate the potential of Zankov's Lesson in terms of students analyzing numerical equalities. The authors of Chapter 9 focus on high leverage mathematical practices in elementary pre-service teacher preparation, drawing into specific relief the APEX cycle to develop deep thinking. In Chapter 10, the author focuses on number talks and the engagement of students in mathematical reasoning, which provides opportunities for students to be sensemakers of mathematics. Chapter 11 presents an epilogue, focusing on the importance of recognizing the special nature of mathematics knowledge for teaching.

Global Perspectives and Practices for Reform-Based Mathematics Teaching - Kartal, Ozgul 2022-04-22

Reform-based mathematics has become a popular topic in the education field as this teaching emphasizes classroom discourse and instructional goals related to student engagement and an understanding of mathematical reasoning, concepts, and procedures using instructional practices that build on students' informal knowledge of mathematics. It also connects mathematics with other disciplines and the real world and provides opportunities for students to contribute and invent their own methods during problem-solving. Further study on the best practices, benefits, and challenges of implementing this teaching into education is required. Global

Perspectives and Practices for Reform-Based Mathematics Teaching explores international perspectives on diverse reform-based practices in teaching and learning mathematics, describes challenges and issues for teachers and teacher educators, promotes reflection and academic discussion at various levels and in various educational systems, and raises questions for the field of mathematics education. Covering a range of topics such as teacher preparation programs and integrated learning spaces, this reference work is ideal for academicians, practitioners, researchers, instructors, educators, and students.

Number Talks - Sherry Parrish 2016

"This resource was created in response to the requests of teachers--those who want to implement number talks but are unsure of how to begin, and those with experience who want more guidance in crafting purposeful problems."--Page 4 de la couverture.

Mathematics for Machine Learning - Marc Peter Deisenroth 2020-04-23

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

Becoming the Math Teacher You Wish You'd Had - Tracy Zager 2017

Readers, be warned: you are about to fall in love. Tracy writes, "Good math teaching begins with us." With those six words, she invites you on a journey through this most magnificent book of stories and portraits...This book turns on its head the common misconception of mathematics as a black-and-white discipline and of being good at math as entailing ease, speed, and correctness. You will find it full of color, possibility, puzzles, and delight...Let yourself be drawn in. Elham Kazemi, professor, math education, University of Washington While mathematicians describe mathematics as playful, beautiful, creative, and captivating, many students describe math class as boring, stressful, useless, and humiliating. In Becoming the Math Teacher You Wish You'd Had, Tracy Zager helps teachers close this gap by making math class more like mathematics. Tracy spent years with highly skilled math teachers in a diverse range of settings and grades. You'll find this book jam-packed with new thinking from these vibrant classrooms. You'll grapple with big ideas: How is taking risks inherent to mathematics? How do mathematicians balance intuition and proof? How can teachers value both productive mistakes and precision? You'll also find dozens of practical teaching techniques you can try in your classroom right away--strategies to stimulate students to connect ideas; rich tasks that encourage students to wonder, generalize, conjecture, and persevere; routines to teach students how to collaborate. All teachers can move toward increasingly authentic, delightful, robust mathematics teaching and learning for themselves and their students. This important book helps us develop instructional techniques that will make the math classes we teach so much better than the math classes we took.

How Students Learn - National Research Council 2005-01-28

How Students Learn: Science in the Classroom builds on the discoveries detailed in the best-selling How People Learn. Now these findings are presented in a way that teachers can use immediately, to revitalize their work in the classroom for even greater effectiveness. Organized for utility, the book explores how the principles of learning can be applied in science at three levels: elementary, middle, and high

school. Leading educators explain in detail how they developed successful curricula and teaching approaches, presenting strategies that serve as models for curriculum development and classroom instruction. Their recounting of personal teaching experiences lends strength and warmth to this volume. This book discusses how to build straightforward science experiments into true understanding of scientific principles. It also features illustrated suggestions for classroom activities.

Answers to Your Biggest Questions About Teaching Elementary Math - John J. SanGiovanni 2021-08-31

Your guide to grow and learn as a math teacher! Let's face it, teaching elementary math can be hard. So much about how we teach math today may look and feel different from how we learned it. Today, we recognize placing the student at the center of their learning increases engagement, motivation, and academic achievement soars. Teaching math in a student-centered way changes the role of the teacher from one who traditionally "delivers knowledge" to one who fosters thinking. Most importantly, we must ensure our practice gives each and every student the opportunity to learn, grow, and achieve at high levels, while providing opportunities to develop their agency and authority in the classroom which results in a positive math identity. Whether you are a brand new teacher or a veteran, if you find teaching math to be quite the challenge, this is the guide you want by your side. Designed for just-in-time learning and support, this practical resource gives you brief, actionable answers to your most pressing questions about teaching elementary math. Written by four experienced math educators representing diverse experiences, these authors offer the practical advice they wish they received years ago, from lessons they′ve learned over decades of practice, research, coaching, and through collaborating with teams, teachers and colleagues—especially new teachers—every day. Questions and answers are organized into five areas of effort that will help you most thrive in your elementary math classroom: 1. How do I build a positive math community? 2. How do I structure, organize, and manage my math class? 3. 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?