

# Making Sense

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teaching  
and learning  
mathematics  
with  
understanding

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# Making Sense Teaching And Learning Mathematics With Understanding

**Linda Jensen Sheffield, Douglas E.  
Cruikshank**



## **Making Sense Teaching And Learning Mathematics With Understanding:**

Making Sense James Hiebert,1997 This book presents several key principles for teaching mathematics for understanding that you can use to reflect on your own teaching make more informed decisions and develop more effective systems of instruction

*Making Sense of Mathematics for Teaching Grades 6-8* Edward C. Nolan,Juli K. Dixon,2016-04-13 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

Making Sense of Mathematics for Teaching, Grades 3-5 Juli K. Dixon,Edward C. Nolan,2016-04-11 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 Making Sense of Mathematics for Teaching the Small Group Juli K. Dixon, Lisa A. Brooks, Melissa R. Carli, 2018-07-06 When done right small group instruction is a powerful tool for facilitating student understanding in K 5 mathematics Throughout the book best practices for small group math instruction are addressed in detail from planning tasks that encourage deep understanding to asking effective questions to engaging learners in meaningful conversations Readers will learn how teaching mathematics in small groups allows you to differentiate instruction for both remediation and enrichment The included small group instruction videos demonstrate the suggested strategies in a real classroom setting giving readers the opportunity to see best practice in action Develop math specific instruction strategies for teaching small groups in elementary school Explore the benefits of small group math activities and how these activities are unique compared to large group instruction Discover the teacher s and students roles in small group instruction and how teachers can help students develop the skills to fulfill their role Learn how to apply the general tasks questions and evidence TQE process to small group instruction in order to enhance student learning and improve your knowledge of teaching mathematics View examples of small group instruction which provide both math intervention and math enrichment activities for different students Contents Acknowledgments Table of Contents About the Authors Introduction Chapter 1 Best Practices in Small Group Instruction Chapter 2 The TQE Process in Small Group Instruction Chapter 3 Discourse in Small Group Instruction Epilogue How to Tie It All Together References Index Making Sense of Mathematics for Teaching Grades K-2 Juli K. Dixon, Edward C. Nolan, 2016-04-11 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 *Making Sense of Mathematics Teacher Education* Fou-Lai Lin, T COONEY, 2001-07-31 This is a research

based book that deals with a broad range of issues about mathematics teacher education It examines teacher education programs from different societies and cultures as it develops an international perspective on mathematics teacher education Practical situations that are associated with related theories are studied critically It is intended for teacher educators mathematics educators graduate students in mathematics education and mathematics teachers

**Making Sense of Number, K-10** Mary Fiore,Ryan Tackaberry,2018-11-27 This practical book shows you how to get to know the needs and abilities of your students and help them make sense of math concepts Designed to enhance your professional learning the book shows you how to notice interpret confirm and respond to student thinking You will discover how to structure learning experiences around key number concepts quantity counting relating and representing developed across various strands patterning and algebra numbers and operations measurement geometry and data and probability Powerful examples of questions and prompts guide you to create a classroom where students get the support they need as they develop confidence in their number sense

*Making Sense of Mathematics for Teaching High School* Edward C. Nolan,Juli K. Dixon,Farhsid Safi,Erhan Selcuk Haciomeroglu,2016-05-19 Develop a deep understanding of mathematics by grasping the context and purpose behind various strategies This user friendly resource presents high school 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 Combine student understanding of functions and algebraic concepts so that they can better decipher the world Benefits Dig deep into mathematical modeling and reasoning to improve as both a learner and teacher of mathematics Explore how to develop select or 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 Gain clarity about the most productive progression of mathematical teaching and learning for high school Watch short videos that show what classrooms that are developing mathematical understanding should look like Contents Introduction Equations and Functions Structure of Equations Geometry Types of Functions Function Modeling Statistics and Probability Epilogue Next Steps Appendix Weight Loss Study Data References Index

*Mathematics Teaching and Learning* Rina Kim,Lillie R. Albert,2015-03-24 The purpose of this research is to identify the categories of South Korean elementary teachers knowledge for teaching mathematics Emerging from the data collected and the subsequent analysis are five categories of South Korean elementary teachers knowledge for teaching mathematics Mathematics Curriculum Knowledge Mathematics Learner Knowledge Fundamental Mathematics Conceptual Knowledge Mathematics Pedagogical Content Knowledge and Mathematics Pedagogical Procedural Knowledge The first three categories of knowledge play a significant role in mathematics instruction as an integrated form within

Mathematics Pedagogical Content Knowledge This study also demonstrated that Mathematics Pedagogical Procedural Knowledge might play a pivotal role in constructing Mathematics Pedagogical Content Knowledge These findings are connected to results from relevant studies in terms of the significant role of teachers knowledge in mathematics instruction

*Mathematical Subjects* Fiona Walls,2009-08-10 Teaching and learning mathematics is a political act in which children teachers parents and policy makers are made visible as subjects As they learn about mathematics children are also learning about themselves who they are who they might become We can choose to listen or not to what children have to say about learning mathematics Such choices constitute us in relations of power Mathematical know how is widely regarded as essential not only to the life chances of individuals but also to the health of communities and the economic well being of nations With the globalisation of education in an increasingly market oriented world mathematics has received intensified attention in the first decade of the twenty first century with a shifting emphasis on utilitarian aspects of mathematics This is reflected in the reconceptualisation of mathematical competence as mathematical literacy loosely conceived as those ways of thinking reasoning and working mathematically that allow us to engage effectively in everyday situations in many occupations and the cut and thrust of world economies as active empowered and participatory citizens It is no surprise then that mathematics has become one of the most politically charged subjects in primary school curricula worldwide We are experiencing an unprecedented proliferation of regional and national strategies to establish benchmarks raise standards enhance achievement close gaps and leave no child behind in mathematics education Industries have sprung up around the design administration and monitoring of standardised assessment to measure and compare children s mathematical achievement against identified benchmarks and each other

### **Becoming a Primary Mathematics Specialist Teacher**

Gina Donaldson,Jenny Field,Dave Harries,Clare Tope,Helen Taylor,2013-08-15 What is the role of the mathematics specialist What is deep subject knowledge in mathematics What sort of pedagogical knowledge does a mathematics specialist need How can you best support your colleagues to improve mathematics teaching and learning *Becoming a Primary Mathematics Specialist Teacher* helps you explore the role of the specialist in promoting positive attitudes towards mathematics and developing the teaching and learning of mathematics in your primary school Illustrated throughout with classroom based examples and referenced to relevant research it is designed to support your development as a reflective practitioner who can confidently review and develop practice in your own classroom as well as challenge and move the whole school forward through collaborative professional development Essential topics explored include The nature of the role of the primary mathematics specialist Understanding how attitudes to mathematics evolve and why it is crucial to challenge and change negativity What we mean by deep subject knowledge in primary mathematics Pedagogical knowledge of how mathematics is taught and learned The skills of coaching and mentoring to support teachers and teaching assistants Unpicking the principles of progression for high quality teaching in all years groups The key features of deep subject knowledge and pedagogy in

three areas of the curriculum multiplication time and data handling Becoming a Primary Mathematics Specialist Teacher is an essential source of guidance and ideas for all primary school teachers aiming to achieve Mathematics Specialist status or already taking this role those studying primary mathematics as a specialism and at masters level and for all primary mathematics co ordinators

*Eight Habits of Highly Effective Math Students (and the Teachers Who Teach Them)* Sue Chapman, Holly Burwell, Mary Mitchell, 2025-03-20 Essential habits to build mathematical confidence and competence for all students It has been said that teachers make approximately 1 500 decisions a day Given the volume of work it is no wonder that these decisions are frequently made reflex like and in the moment By intentionally nurturing effective habits in students as well as in teachers we can make these decisions more deliberately and in so doing foster a positive relationship with mathematics that will set students on an unstoppable trajectory of math learning Eight Habits of Highly Effective Math Students and the Teachers Who Teach Them focuses on developing eight essential habits that support mathematical competence and confidence in students This resource is designed as a personalized practice based professional learning experience leading you through a wealth of professional learning and application activities to support you in growing a specific math habit in your classroom to strengthen your students math learning and build your own efficacy The book offers the chance to choose your own adventure through three teacher inquiry options focused on a specific math habit Give it a Go An Informal Exploration of a Teaching Action and Its Impact on Student Learning Classroom Inquiry A Classroom Based Teacher Inquiry Project Focus on Equity A Teacher Inquiry to Notice and Disrupt Patterns of Inequity This book provides an actionable framework for improving math teaching and learning by Emphasizing a commitment to equity because all students are capable of learning high level mathematics when provided with access to high quality instruction Helping teachers develop mindsets and habits to consciously reflect on their instructional practice to continually strengthen teaching effectiveness and student learning outcomes Curating short readings and practice based professional learning activities that can be engaged in individually or collaboratively Highlighting the importance of celebrating growth and the role of teachers in nurturing good habits in their students Offering a guide to coaching the habit through a process called Notice Nurture Name and Nudge Eight Habits of Highly Effective Math Students and the Teachers Who Teach Them is grounded in the unwavering belief that all students are math capable and all teachers can effectively teach mathematics The book can be used individually by elementary school teachers and education leaders at school and district levels or in collaborative professional learning settings It is an excellent companion to Holly Burwell and Sue Chapman s book Power Up Your Math Community Corwin 2024

**Key Concepts in Teaching Primary Mathematics** Derek Haylock, 2007-09-17 Covering the key principles and concepts in the teaching and learning of mathematics in primary schools this text provides trainee and practising teachers with a quick and easy reference to what they need to know for their course and in the classroom The entries are arranged alphabetically and each contains a brief definition followed by an explanation and discussion practical

examples and annotated suggestions for further reading Examples of the wide ranging material include Anxiety about mathematics Assessment for Learning Cognitive conflict Concept learning Creativity in mathematics Differentiation Equivalence Explanation Investigation Low attainment Making connections Meaningful context Mental calculation Numeracy Play as a context for learning mathematics Problem solving Questioning Talk *Making Sense of Mathematics for Teaching Girls in Grades K - 5* Thomasenia Lott Adams,Taylor B. Wenzel,Kristopher J. Childs,Samantha R. Neff,2019-03-08 Close the gender gap in mathematics across K 5 classrooms In *Making Sense of Mathematics for Teaching Girls in Grades K 5* a team of acclaimed experts presents their research and recommendations for teaching math to girls in four succinct results focused chapters Included are a variety of tools tips short exercises and reflection questions as well as videos demonstrating how real classroom teachers strengthen girls experiences as learners of mathematics Use this book to better understand gender biases related to mathematics and improve girls education Understand the environmental barriers and gender stereotypes that create gender differences in mathematics performance and prevent many girls from learning mathematics at high levels Learn how to foster a safe learning environment that encourages girls to take risks when they learn math Focus on the mathematics gender achievement gap through three lenses 1 perceptions 2 possibilities and 3 priorities Apply the tasks questions and evidence TQE process to successfully plan and implement inclusive lessons that engage all students Watch short videos of girls engaging meaningfully in mathematics learning Contents About the Authors Introduction Chapter 1 Mathematics Gender Achievement Gap Chapter 2 Perceptions About Girls in Mathematics Chapter 3 Possibilities for Girls in Mathematics Chapter 4 Priorities for Teaching Girls Mathematics Epilogue Encouragement for Girls in Mathematics References and Resources Index [The Teaching Gap](#) James W. Stigler,James Hiebert,2009-06-16 Ten years after its first publication *The Teaching Gap* is now in paperback for the first time and updated with a new Preface and Afterword Written in clear jargon free prose this book is for teachers school administrators policy makers politicians and concerned parents Library Journal *Making Sense of Mathematics for Teaching to Inform Instructional Quality* Melissa D. Boston,Amber G. Candela,Juli K. Dixon,2019-02-28 Discover a clear path for improving your instructional strategies for teaching mathematics at any grade level Designed for individuals or collaborative teams this practical resource introduces a set of rubrics the Instructional Quality Assessment IQA Toolkit that readers can rely on to help guide reflections conversations feedback and planning Also included is a series of short videos that showcase how to use the book s math strategies and tools in classrooms Ensure the instructional quality of your teaching strategies in mathematics Utilize tasks questions and evidence the TQE process and the associated IQA rubrics as a road map for increasing instructional quality Become familiar with the connection between efficient use of tasks and teacher questioning with increased student success Learn how to gauge student response to tasks and lessons in order to understand student mastery of the material Enhance your understanding of math strategies through hands on activities Access free online reproducibles for use in teaching mathematics in the

classroom Contents About the Authors Introduction Part 1 Connecting to the T in TQE Tasks and Task Implementation Chapter 1 Potential of the Task Chapter 2 Implementation of the Task Part 2 Connecting to the Q in TQE Questions and Their Role as Discourse Actions Chapter 3 Teacher s Questions Chapter 4 Teacher s Linking and Teacher s Press Part 3 Connecting to the E in TQE Evidence of Students Mathematical Work and Thinking Chapter 5 Students Linking and Students Providing Chapter 6 The IQA Toolkit as a Tool to Assess and Improve Instructional Practice Epilogue Next Steps Appendix A The IQA Toolkit Appendix B Suggested Answers for Activity 1 4 Appendix C Suggested Answers for Activity 3 2 Appendix D Additional Support for Rating Tasks Appendix E List of Figures and Videos References and Resources Index More Making Sense of Mathematics Books Making Sense of Mathematics for Teaching Grades K 2 Making Sense of Mathematics for Teaching Grades 3 5 Making Sense of Mathematics for Teaching Grades 6 8 Making Sense of Mathematics for Teaching High School Making Sense of Mathematics for Teaching to Inform Instructional Quality Making Sense of Mathematics for Teaching Girls in Grades K 5 Making Sense of Mathematics for Teaching the Small Group **The Mathematics Educator** ,2008

**Teaching and Learning Mathematics** Linda Jensen Sheffield,Douglas E. Cruikshank,2004-03-29 Help students make sense of mathematics Rather than merely discussing how to improve students ability to do mathematics this fifth edition focuses on helping them make sense of mathematics Based on research on the functioning of the mind as it engages in learning the text supports teachers as they promote mathematical understanding strengthen students abilities to think and help students to attain computational fluency Features A rich collection of ready to use learning activities Fully integrated language and intent of Principles and Standards for School Mathematics PSSM A greater emphasis on problem solving and higher level thinking A greater focus on teaching mathematics to diverse learners Descriptions of a variety of promising and effective mathematics programs for the K 8 levels *ENC Focus* ,1999 **Understanding the Math You Teach** Anita C. Burris,2005 Teaching strategies are grounded in the NCTM standards and illustrated with real student work In addition the author provides a full range of concrete developmental activities that encourage future teachers to make math make sense for themselves as well as for their students Believing that teachers who are comfortable with mathematics develop learners who are comfortable with mathematics this author empowers preservice preK 4 teachers to teach math confidently by laying a solid foundation of math concepts and building on that foundation with engaging meaningful standards based teaching methods Integrated in this unique combined approach to teaching mathematics is a thorough discussion of math manipulatives as well as the use of technology computer and otherwiseto assist today s mathematics teacher For educators aids and parents responsible for teaching Pre K to fourth grade math

The Enigmatic Realm of **Making Sense Teaching And Learning Mathematics With Understanding**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing short of extraordinary. Within the captivating pages of **Making Sense Teaching And Learning Mathematics With Understanding** a literary masterpiece penned by way of a renowned author, readers embark on a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting effect on the hearts and minds of those who partake in its reading experience.

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