

## Active Learning In The Mathematics Classroom Grades 5 8

Research and Practice of Active Learning in Engineering Education  
Discrete Mathematics with Ducks  
Abstract Algebra  
Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age  
Approaches to Learning and Teaching Mathematics  
Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age  
Jump Into Math  
Uniformization of Riemann Surfaces  
Promoting Active Learning through the Flipped Classroom Model  
Math, Grade 6 Active Learning Textbook Course 1  
Active Learning - Measurement, Chance and Data  
Developing Learner-Centered Teaching  
Teaching Mathematics Visually and Actively  
Flipped Learning for Science Instruction  
Concept-rich Mathematics Instruction  
Literacy Strategies for Improving Mathematics Instruction  
Foundations of Mathematics  
Lesson Imaging in Math and Science  
Active Learning in the Mathematics Classroom, Grades 5-8  
The Mathematics Teacher Education Partnership  
Discipline-Based Education Research  
Activities Linking Science With Math, 5-8  
Freedom to Learn  
Active Learning Strategies in Higher Education  
Elliptic PDEs, Measures and Capacities  
Helping Children Learn Mathematics, Active Learning Edition with Field Experience Resources  
Creative Activities in Mathematics  
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Handbook of Research on Educational Technology Integration and Active Learning  
Learning to Love Math  
How to Teach Mathematics, Second Edition  
Mathematics for Machine Learning  
Tactile Learning Activities in Mathematics  
Developing Active Learning in the Primary Classroom  
Handbook of Research on Blended Learning  
Pedagogies and Professional Development in Higher Education  
Writing to Learn Mathematics and Science  
Hands on History  
English Language Learners in the Mathematics Classroom  
Exploring Maths Through Stories and Rhymes  
Active Learning in College Science

### Research and Practice of Active Learning in Engineering Education

For student teachers and teachers.

### Discrete Mathematics with Ducks

"This book focuses on an in-depth assessment on strategies and instructional design practices appropriate for the flipped classroom model, highlighting the benefits, shortcoming, perceptions, and academic results of the flipped classroom model"--Provided by publisher.

### Abstract Algebra

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.

### **Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age**

Online and blended courses are becoming increasingly prevalent in higher education settings, and the pressures to incorporate these environments highlights the increased demand to serve a generation that prefers learning through experience or through interacting with learning tools. Challenges arise in assisting instructors in facilitating and designing blended learning environments that will provide effective learning for all students. The Handbook of Research on Blended Learning Pedagogies and Professional Development in Higher Education is a critical research publication that delves into the importance of effective professional development for educators planning and teaching online or blended courses. It also establishes the benefits of technology-mediated learning environments over traditional learning methods. Highlighting a wide array of topics such as online learning environments, active learning model, and educational development, this publication explores technology-based teaching methods in higher education. This book is targeted toward educators, educational administrators, academicians, researchers, and professionals within the realm of higher education.

### **Approaches to Learning and Teaching Mathematics**

Is there a way to get students to love math? Dr. Judy Willis responds with an emphatic yes in this informative guide to getting better results in math class. Tapping into abundant research on how the brain works, Willis presents a practical approach for how we can improve academic results by demonstrating certain behaviors and teaching students in a way that minimizes negativity. With a straightforward and accessible style, Willis shares the knowledge and experience she has gained through her dual careers as a math teacher and a neurologist. In addition to learning basic brain anatomy and function, readers will learn how to

- \* Improve deep-seated negative attitudes toward math.
- \* Plan lessons with the goal of "achievable challenge" in mind.
- \* Reduce mistake anxiety with techniques such as errorless math and estimation.
- \* Teach to different individual learning strengths and skill levels.
- \* Spark motivation.
- \* Relate math to students' personal interests and goals.
- \* Support students in setting short-term and long-term goals.
- \* Convince students that they can change their

intelligence. With dozens of strategies teachers can use right now, Learning to Love Math puts the power of research directly into the hands of educators. A Brain Owner's Manual, which dives deeper into the structure and function of the brain, is also included—providing a clear explanation of how memories are formed and how skills are learned. With informed teachers guiding them, students will discover that they can build a better brain . . . and learn to love math!

## **Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age**

### **Jump Into Math**

Developing Learner-Centered Teaching offers a step-by-step plan for transforming any course from teacher-centered to the more engaging learner-centered model. Filled with self-assessments and worksheets that are based on each of the five practices identified in Maryellen Weimer's Learner-Centered Teaching, this groundbreaking book gives instructors, faculty developers, and instructional designers a practical and effective resource for putting the learner-centered model into action.

### **Uniformization of Riemann Surfaces**

### **Promoting Active Learning through the Flipped Classroom Model**

Problem-based learning is a powerful alternative to drill-and-practice or skills-based learning, especially within mathematics, but it can be difficult to source rich materials that engage an entire class. The Creative Activities in Mathematics series provides a wealth of investigations and open-ended active learning activities, designed to engage students with mathematics and develop their problem-solving, collaboration and mathematical skills. Book One provides twelve different class activities suitable for students from Foundation to Year 4, along with teaching notes and staged lesson plans. Each activity is a whole-class investigation with open-ended answers that takes a particular scenario and develops it over three levels. This enables it to be used both at different year levels and with students of differing ability in the same class. All activities are firmly rooted in the Australian Curriculum: Mathematics and linked to the content descriptors of the Number & Algebra, Measurement & Geometry and Statistics & Probability strands. The companion website provides links to additional information and problem-based activities from around the Web, as well as student-friendly activity worksheets for teachers to download and print for their classes.

### **Math, Grade 6 Active Learning Textbook Course 1**

## **Active Learning - Measurement, Chance and Data**

Strengthen mathematical understandings and academic vocabulary with standards-based strategies! With straightforward language and examples, the authors help teachers develop specialized understanding and knowledge of strategies for supporting a high level of mathematics learning along with language acquisition for ELLs. Providing specific suggestions for teaching standards-based mathematics, this resource: Demonstrates how to incorporate ELL supports and strategies through sample lessons Uses concrete materials and visuals to connect mathematical concepts with language development Focuses on essential mathematical vocabulary Includes brief research summaries with rationales for recommended practices

## **Developing Learner-Centered Teaching**

Since 2001, the international network Active Learning in Engineering education (ALE) organized a series of international workshops on innovation of engineering education. The papers in this book are selected to reflect the state of the art, based on contributions to the 2005 ALE workshop in Holland. This overview of experiences in research and practice aims to be a source of inspiration for engineering educators.

## **Teaching Mathematics Visually and Actively**

Discrete Mathematics with Ducks, Second Edition is a gentle introduction for students who find the proofs and abstractions of mathematics challenging. At the same time, it provides stimulating material that instructors can use for more advanced students. The first edition was widely well received, with its whimsical writing style and numerous exercises and materials that engaged students at all levels. The new, expanded edition continues to facilitate effective and active learning. It is designed to help students learn about discrete mathematics through problem-based activities. These are created to inspire students to understand mathematics by actively practicing and doing, which helps students better retain what they've learned. As such, each chapter contains a mixture of discovery-based activities, projects, expository text, in-class exercises, and homework problems. The author's lively and friendly writing style is appealing to both instructors and students alike and encourages readers to learn. The book's light-hearted approach to the subject is a guiding principle and helps students learn mathematical abstraction. Features: The book's Try This! sections encourage students to construct components of discussed concepts, theorems, and proofs Provided sets of discovery problems and illustrative examples reinforce learning Bonus sections can be used by instructors as part of their regular curriculum, for projects, or for further study

## **Flipped Learning for Science Instruction**

Helping Children Learn Mathematics, Sixth Edition, is written for elementary school teachers to help children learn mathematics meaningfully. This revision reflects major changes in the elementary school mathematics curriculum, assessment, and professional development of teacher education consistent with the National Council of Teachers of Mathematics, Standards 2000. The first part of the text provides a base for understanding the changing mathematics curriculum and how children learn in it. It offers guidelines for planning instruction with an emphasis on problem solving and assessment. The second part of the text discusses teaching strategies, techniques and learning activities related to specific mathematical topics. Emphasis is on using models and materials to understand concepts and skills.

## **Concept-rich Mathematics Instruction**

This book focuses on selected best practices for effective active learning in Higher Education. Contributors present the epistemology of active learning along with specific case studies from different disciplines and countries. Discussing issues around ICTs, collaborative learning, experiential learning and other active learning strategies.

## **Literacy Strategies for Improving Mathematics Instruction**

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.

## **Foundations of Mathematics**

Q: What do feather boas, cookies, and paper shredders have in common? A: They are all ingredients that have the potential to help your undergraduate students understand a variety of mathematical concepts. In this book, 43 faculty from a wide

range of institutional settings share a total of 64 hands-on activities that allow students to physically engage with mathematical ideas ranging from the basics of precalculus to special topics appropriate for upper-level courses. Each learning activity is presented in an easy-to-read recipe format that includes a list of supplies; a narrative briefly describing the reasons, logistics, and helpful hints for running the activity; and a page that can be used as a handout in class. Purchase of the book also includes access to electronic printable versions of the handouts. With so many activities, it might be hard to decide where to start. For that reason, there are four indices to help the reader navigate this book: a concept index, a course index, an [Author]; index, and a main ingredient index. In addition to providing activities for precalculus, calculus, commonly required mathematics courses for majors, and more specialized upper-level electives, there is also a section describing how to modify many of the activities to fit into a liberal arts mathematics class. Whether you are new to using hands-on activities in class or are more experienced, the [Author];s hope that this book will encourage and inspire you to explore the possibilities of using more hands-on activities in your classes. Bon appetit!

### **Lesson Imaging in Math and Science**

This practical book is packed with tried-and-tested activities which draw on popular stories and rhymes, and use everyday materials and objects to help young children develop their understanding and enjoyment of mathematical concepts. By relating ideas of number, shape, size and pattern to everyday contexts, stories and experiences, Exploring Maths through Stories and Rhymes improves confidence, increases understanding and develops children's desire to engage with maths. Offering a range of creative and exciting activities to encourage hands-on learning and discussion, chapters: include a range of step-by-step activities which are easily adapted to varying needs, ages and abilities use popular stories and nursery rhymes as a way of engaging children with mathematical thinking show how inexpensive, everyday materials can be used to encourage learning include full colour photographs, photocopyable materials, vocabulary lists and key questions to help the reader get the most out of the ideas described This practical text will be a go-to resource for early years practitioners and students looking to adopt a creative approach to early years mathematics.

### **Active Learning in the Mathematics Classroom, Grades 5-8**

Jump into Math is the perfect way to turn children's love of active games into learning opportunities! The activities in each chapter are organized by level of difficulty, and each one incorporates fun, exciting math experiences with movement. Most activities require few or no materials and include related children's books or music to extend the learning. The math skills index is an invaluable reference tool, giving teachers flexibility to plan around children's interests.

### **The Mathematics Teacher Education Partnership**

This book explores evidence-based practice in college science teaching. It is grounded in disciplinary education research by practicing scientists who have chosen to take Wieman's (2014) challenge seriously, and to investigate claims about the efficacy of alternative strategies in college science teaching. In editing this book, we have chosen to showcase outstanding cases of exemplary practice supported by solid evidence, and to include practitioners who offer models of teaching and learning that meet the high standards of the scientific disciplines. Our intention is to let these distinguished scientists speak for themselves and to offer authentic guidance to those who seek models of excellence. Our primary audience consists of the thousands of dedicated faculty and graduate students who teach undergraduate science at community and technical colleges, 4-year liberal arts institutions, comprehensive regional campuses, and flagship research universities. In keeping with Wieman's challenge, our primary focus has been on identifying classroom practices that encourage and support meaningful learning and conceptual understanding in the natural sciences. The content is structured as follows: after an Introduction based on Constructivist Learning Theory (Section I), the practices we explore are Eliciting Ideas and Encouraging Reflection (Section II); Using Clickers to Engage Students (Section III); Supporting Peer Interaction through Small Group Activities (Section IV); Restructuring Curriculum and Instruction (Section V); Rethinking the Physical Environment (Section VI); Enhancing Understanding with Technology (Section VII), and Assessing Understanding (Section VIII). The book's final section (IX) is devoted to Professional Issues facing college and university faculty who choose to adopt active learning in their courses. The common feature underlying all of the strategies described in this book is their emphasis on actively engaging students who seek to make sense of natural objects and events. Many of the strategies we highlight emerge from a constructivist view of learning that has gained widespread acceptance in recent years. In this view, learners make sense of the world by forging connections between new ideas and those that are part of their existing knowledge base. For most students, that knowledge base is riddled with a host of naïve notions, misconceptions and alternative conceptions they have acquired throughout their lives. To a considerable extent, the job of the teacher is to coax out these ideas; to help students understand how their ideas differ from the scientifically accepted view; to assist as students restructure and reconcile their newly acquired knowledge; and to provide opportunities for students to evaluate what they have learned and apply it in novel circumstances. Clearly, this prescription demands far more than most college and university scientists have been prepared for.

### **Discipline-Based Education Research**

Research shows that students learn best when they actively participate in their learning. In particular, hands-on activities provide the greatest opportunities for gaining understanding and promoting retention. Apart from simple manipulatives, the mathematics classroom offers few options for hands-on activities. However, the history of mathematics offers many ways to incorporate hands-on learning. By bringing this material culture of mathematics into the classroom, students can experience historical applications and uses of mathematics in a setting rich in discovery and intellectual interest. This

volume is a compilation of articles from researchers and educators who use the history of mathematics to facilitate active learning in the classroom. The contributions range from simple devices, such as the rectangular protractor, to elaborate models of descriptive geometry. Other chapters provide detailed descriptions on how to build and use historical models in the high school or collegiate classroom.

### **Activities Linking Science With Math, 5-8**

Partial differential equations (PDEs) and geometric measure theory (GMT) are branches of analysis whose connections are usually not emphasized in introductory graduate courses. Yet one cannot dissociate the notions of mass or electric charge, naturally described in terms of measures, from the physical potential they generate. Having such a principle in mind, this book illustrates the beautiful interplay between tools from PDEs and GMT in a simple and elegant way by investigating properties such as existence and regularity of solutions of linear and nonlinear elliptic PDEs. Inspired by a variety of sources, from the pioneer balayage scheme of Poincare to more recent results related to the Thomas-Fermi and Chern-Simons models, the problems covered in this book follow an original presentation, intended to emphasize the main ideas in the proofs. Classical techniques such as regularity theory, maximum principles and the method of sub- and supersolutions are adapted to the setting where merely integrability or density assumptions on the data are available. The distinguished role played by capacities and precise representatives is also explained. Other special features are: the remarkable equivalence between Sobolev capacities and Hausdorff contents in terms of trace inequalities; the strong approximation of measures in terms of capacities or densities, normally absent from GMT books; and the rescue of the strong maximum principle for the Schrodinger operator involving singular potentials. This book invites the reader on a trip through modern techniques in the frontier of elliptic PDEs and GMT and is addressed to graduate students and researchers with a deep interest in analysis. Most of the chapters can be read independently, and only a basic knowledge of measure theory, functional analysis, and Sobolev spaces is required.

### **Freedom to Learn**

Provides teachers with classroom-proven ways to prepare students to be successful math learners by teaching the vocabulary and comprehension skills needed to understand mathematics.

### **Active Learning Strategies in Higher Education**

The notion of a flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a flipped class is in the repurposing of class time into a workshop where students can

inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. The Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age highlights current research on the latest trends in education with an emphasis on the technologies being used to meet learning objectives. Focusing on teaching strategies, learner engagement, student interaction, and digital tools for learning, this handbook of research is an essential resource for current and future educators, instructional designers, IT specialists, school administrators, and researchers in the field of education.

### **Elliptic PDEs, Measures and Capacities**

The National Science Foundation funded a synthesis study on the status, contributions, and future direction of discipline-based education research (DBER) in physics, biological sciences, geosciences, and chemistry. DBER combines knowledge of teaching and learning with deep knowledge of discipline-specific science content. It describes the discipline-specific difficulties learners face and the specialized intellectual and instructional resources that can facilitate student understanding. Discipline-Based Education Research is based on a 30-month study built on two workshops held in 2008 to explore evidence on promising practices in undergraduate science, technology, engineering, and mathematics (STEM) education. This book asks questions that are essential to advancing DBER and broadening its impact on undergraduate science teaching and learning. The book provides empirical research on undergraduate teaching and learning in the sciences, explores the extent to which this research currently influences undergraduate instruction, and identifies the intellectual and material resources required to further develop DBER. Discipline-Based Education Research provides guidance for future DBER research. In addition, the findings and recommendations of this report may invite, if not assist, post-secondary institutions to increase interest and research activity in DBER and improve its quality and usefulness across all natural science disciplines, as well as guide instruction and assessment across natural science courses to improve student learning. The book brings greater focus to issues of student attrition in the natural sciences that are related to the quality of instruction. Discipline-Based Education Research will be of interest to educators, policy makers, researchers, scholars, decision makers in universities, government agencies, curriculum developers, research sponsors, and education advocacy groups.

### **Helping Children Learn Mathematics, Active Learning Edition with Field Experience Resources**

A subject-specific guide for international secondary teachers to supplement learning and provide resources for lesson planning. Approaches to learning and teaching Mathematics is the result of close collaboration between Cambridge University Press and Cambridge International Examinations. Considering the local and global contexts when planning and teaching an international syllabus, the title presents ideas for Mathematics with practical examples that help put theory into

context. Teachers can download online tools for lesson planning from our website. This book is ideal support for those studying professional development qualifications or international PGCEs.

### **Creative Activities in Mathematics**

This book provides an overview of a body of work conducted over the past seven years related to the preparation of secondary mathematics teachers by the Mathematics Teacher Education Partnership (MTE-Partnership), a national consortium of more than 90 universities and 100 school systems. The MTE-Partnership is organized as a Networked Improvement Community (NIC), which combines the disciplined inquiry of improvement science with the power of networking to accelerate improvement by engaging a broad set of participants. The MTE-Partnership is addressing key challenges in secondary mathematics teacher preparation, including: • Supporting the development of content knowledge relevant to teaching secondary mathematics; • Providing effective clinical experiences to teacher candidates; • Recruiting secondary mathematics teacher candidates, ensuring program completion and their subsequent retention in the field as early career teachers; • Supporting overall transformation of secondary mathematics teacher preparation in alignment with these challenges; • Ensuring a focus on equity and social justice in secondary mathematics teacher recruitment, preparation, and induction. This book outlines existing knowledge related to each of these key challenges, as well as the work of Research Action Clusters (RACs) formed to address the challenges. Each RAC includes participants from multiple institutions who work collaboratively to iteratively develop, test, and refine processes and products that can help programs more effectively prepare secondary mathematics teacher candidates. The book describes promising approaches to improving aspects of secondary mathematics teacher preparation developed by the RACs, including specific products that have been developed, which will inform the work of others involved in secondary mathematics teacher preparation. In addition, reflections on the use of the NIC model provides insights for others considering this research design. Particular references to the Standards for Preparing Teachers of Mathematics (Association of Mathematics Teacher Educators, 2017) are included throughout the book.

### **Active Learning in the Mathematics Classroom, Grades 5-8**

This revised edition of Multiple Intelligences in the Mathematics Classroom provides ready-to-use lessons aligned with NCTM content standards to help students gain meaningful understandings of key mathematical concepts.

### **Handbook of Research on Educational Technology Integration and Active Learning**

To learn and understand mathematics, students must engage in the process of doing mathematics. Emphasizing active

learning, *Abstract Algebra: An Inquiry-Based Approach* not only teaches abstract algebra but also provides a deeper understanding of what mathematics is, how it is done, and how mathematicians think. The book can be used in both rings-first and groups-first abstract algebra courses. Numerous activities, examples, and exercises illustrate the definitions, theorems, and concepts. Through this engaging learning process, students discover new ideas and develop the necessary communication skills and rigor to understand and apply concepts from abstract algebra. In addition to the activities and exercises, each chapter includes a short discussion of the connections among topics in ring theory and group theory. These discussions help students see the relationships between the two main types of algebraic objects studied throughout the text. Encouraging students to do mathematics and be more than passive learners, this text shows students that the way mathematics is developed is often different than how it is presented; that definitions, theorems, and proofs do not simply appear fully formed in the minds of mathematicians; that mathematical ideas are highly interconnected; and that even in a field like abstract algebra, there is a considerable amount of intuition to be found.

### **Learning to Love Math**

This revised edition of *Multiple Intelligences in the Mathematics Classroom* provides ready-to-use lessons aligned with NCTM content standards to help students gain meaningful understandings of key mathematical concepts.

### **How to Teach Mathematics, Second Edition**

### **Mathematics for Machine Learning**

The notion of a flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a flipped class is in the repurposing of class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. *The Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age* highlights current research on the latest trends in education with an emphasis on the technologies being used to meet learning objectives. Focusing on teaching strategies, learner engagement, student interaction, and digital tools for learning, this handbook of research is an essential resource for current and future educators, instructional designers, IT specialists, school administrators, and researchers in the field of education.

### **Tactile Learning Activities in Mathematics**

From respected voices in STEM education comes an innovative lesson planning approach to help turn students into problem solvers: lesson imaging. In this approach, teachers anticipate how chosen activities will unfold in real time—what solutions, questions, and misconceptions students might have and how teachers can promote deeper reasoning. When lesson imaging occurs before instruction, students achieve lesson objectives more naturally and powerfully. A successful STEM unit attends to activities, questions, technology, and passions. It also entails a careful detailed image of how each activity will play out in the classroom. Lesson Imaging in Math and Science presents teachers with \* A process of thinking through the structure and implementation of a lesson \* A pathway to discovering ways to elicit student thinking and foster collaboration \* An opportunity to become adept at techniques to avoid shutting down the discussion—either by prematurely giving or acknowledging the “right” answer or by casting aside a “wrong” answer Packed with classroom examples, lesson imaging templates, and tips on how to start the process, this book is sure to help teachers anticipate students’ ideas and questions and stimulate deeper learning in science, math, engineering, and technology.

### **Developing Active Learning in the Primary Classroom**

Foundations of Mathematics outlines seven strands of practice which underpin successful mathematical development in children aged 3-7. Early years mathematics specialists, Carole and Judith, draw on their experience of working with early years practitioners, including consultants and advisers, across the UK and internationally. The book is completely up-to-date and embeds the Revised Early Years Foundation Stage throughout the book. The book brims with multi-sensory ideas that will trigger children's curiosity, measuring using sand mounds, hunting for buried treasure and building secret dens outdoors. There are: - activities that involve playing and exploring, - games to make learning active, and - experiences to develop creative and critical thinking. Alongside these practical experiences and activities are clear explanations of the reasoning behind the ideas with clear guidance on the role of the practitioner and 'Home Challenges' to promote the engagement of families. The authors provide straightforward advice to support the development of a mathematically-enriched learning environment and ideas to help children transfer learning into their own child-initiated play, to build a genuine and solid foundation for mathematics.

### **Handbook of Research on Blended Learning Pedagogies and Professional Development in Higher Education**

Science does not exist in a vacuum and, therefore, shouldn't be taught that way. In that spirit, Activities Linking Science With Math, 5-8, is a hands-on guide for preservice and inservice elementary and middle school teachers who want to connect science instruction with other areas of study including visual arts, social sciences, language arts, and especially math.

## **Writing to Learn Mathematics and Science**

This practical book provides teachers in primary and secondary schools with advice and resources to develop a visual and active approach to teaching mathematics. It includes, specific examples of teaching strategies and ideas for lesson activities to support teaching mathematics to learners who take information and ideas visually and actively. Accompanying this second edition is a handy CD that includes a range of resources for teaching each topic including: - Dynamic PowerPoint animations which can be used to help learners to develop their understanding of key mathematical concepts - Posters of each concept And in addition to all this, each chapter suggests even further links to other useful resources for every topic to enhance your teaching. With clear explanations and strong visual layout, this is an ideal resource for teachers, SENCOs (Special Educational Needs Co-ordinators) and teaching assistants who want to motivate their learners with different and exciting ways of teaching and learning maths.

## **Hands on History**

As today's teachers prepare to instruct a new generation of students, the question is no longer whether technology should be integrated into the classroom, but only "how?" Forced to combat shorter attention spans and an excess of stimuli, teachers sometimes see technology as a threat rather than a potential enhancement to traditional teaching methods. The Handbook of Research on Educational Technology Integration and Active Learning explores the need for new professional development opportunities for teachers and educators as they utilize emerging technologies to enhance the learning experience. Highlighting the advancements of ubiquitous computing, authentic learning, and student-centered instruction, this book is an essential reference source for educators, academics, students, researchers, and librarians.

## **English Language Learners in the Mathematics Classroom**

Have you ever wondered why students too often have only a rudimentary understanding of mathematics, why even rich and exciting hands-on learning does not always result in "real" learning of new concepts? The answer lies in whether students have actually learned mathematical concepts, rather than merely memorizing facts and formulas. Concept-Rich Mathematics Instruction is based on the constructivist view that concepts are not simply facts to be memorized and later recalled, but rather knowledge that learners develop through an active process of adapting to new experiences. The teacher's role is critical in this process. When teachers prompt students to reflect on their experiences and report and answer questions verbally, students must re-examine and even revise their concepts of reality. Meir Ben-Hur offers expert guidance on all aspects of Concept-Rich Mathematics Instruction, including \* Identifying the core concepts of the mathematics curriculum. \* Planning instructional sequences that build upon concepts that students already understand. \*

Designing learning experiences that provoke thoughtful discussions about new concepts and prepare students to apply these concepts on their own. \* Identifying student errors, particularly those caused by preconceptions, as important sources of information and as key instructional tools. \* Conducting classroom dialogues that are rich in alternative representations. \* Using a variety of formative assessment methods to reveal the state of students' learning. \* Incorporating problem-solving activities that provoke cognitive dissonance and enhance students' cognitive competence. Concept-Rich Mathematics Instruction is grounded in the belief that all students can learn to think mathematically and solve challenging problems. If you're looking for a powerful way to improve students' performance in mathematics and move closer to fulfilling the NCTM standards, look no further: this approach provides the building blocks for constructing a first-class mathematics program.

### **Exploring Maths Through Stories and Rhymes**

Establishing an effective learning environment in the classroom requires a clear understanding of different teaching strategies that make children active participants in their own learning. This book explores a range of philosophies and strategies to develop active learning in primary education. It balances theory with practice to provide evidence-based guidance and suggestions for use in the classroom. Key topics include: Creating a supportive learning environment Developing the questioning skills of teachers and children Learning through assessment Developing thinking skills through curriculum subjects Active learning in early years education Philosophy for Children (P4C) Frameworks to promote thinking This is essential reading for professional studies modules on primary initial teacher education courses, including university-based (PGCE, PGDE, BA QTS, BEd), school-based (SCITT, School Direct) and employment-based routes into teaching. It also serves as a handbook for schools that are developing their approaches to active learning. Anitra Vickery works as senior lecturer in primary mathematics education and the Professional Studies Coordinator at Bath Spa University.

### **Active Learning in College Science**

Building on their best-selling book *Flip Your Classroom: Reach Every Student in Every Class Every Day*, flipped education innovators Jonathan Bergmann and Aaron Sams return with a book series that supports flipped learning in the four topic areas of science, math, English and social studies as well as the elementary classroom.

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