

derek haylock mathematics explained

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Derek Haylock is a renowned figure in the field of mathematics education, celebrated for his comprehensive approach to teaching and understanding mathematics. If you've encountered his name in educational literature or curriculum development, you might be wondering: what exactly does his approach to mathematics entail? This article aims to provide a detailed and accessible explanation of Derek Haylock Mathematics Explained, covering his philosophy, key concepts, and practical applications to help educators, students, and parents better understand his influence on mathematics teaching.

Who Is Derek Haylock?

Derek Haylock is a British mathematician and educator whose work has significantly impacted primary and secondary mathematics education. With decades of experience, Haylock has emphasized the importance of developing pupils' mathematical understanding through engaging, meaningful, and structured teaching strategies. His writings and research focus on how children learn mathematics and how educators can facilitate this learning effectively.

The Core Principles of Derek Haylock's Approach to Mathematics

Derek Haylock's philosophy revolves around several core principles that underpin his approach to teaching mathematics. These principles serve as a foundation for designing curricula, lesson plans, and assessment strategies.

1. Conceptual Understanding Before Procedural Fluency

Haylock advocates for a strong emphasis on developing deep conceptual understanding before encouraging rote procedural skills. He believes that:

- Students should grasp the 'why' behind mathematical processes.
- Understanding concepts leads to better problem-solving skills and adaptability.
- Procedural fluency is important but should be built upon a solid conceptual foundation.

2. Use of Concrete, Pictorial, and Abstract (CPA) Approaches

A hallmark of Haylock's methodology is the CPA approach, which involves:

1. **Concrete:** Using tangible objects and manipulatives to represent mathematical ideas.
2. **Pictorial:** Transitioning to visual representations, diagrams, and models.
3. **Abstract:** Moving to formal symbols, notation, and algorithms.

This progression helps learners build a robust understanding by connecting abstract concepts with physical and visual representations.

3. Differentiated and Inclusive Teaching

Haylock emphasizes tailoring mathematics instruction to meet diverse learners' needs, including those with special educational needs. Strategies include:

- Using varied representations and resources.
- Providing multiple entry points to understanding.
- Encouraging collaborative learning and peer support.

4. Emphasis on Mathematical Reasoning and Problem-Solving

Rather than focusing solely on rote memorization, Haylock advocates for fostering logical reasoning, critical thinking, and the ability to apply mathematics in real-world contexts.

Key Concepts in Derek Haylock Mathematics Explained

Understanding Haylock's approach involves exploring several key concepts that define his teaching philosophy.

1. Mathematical Fluency

Mathematical fluency, according to Haylock, is about more than speed or accuracy; it involves:

- Having a flexible understanding of mathematical concepts.
- Being able to select and apply appropriate strategies.
- Developing confidence in manipulating numbers and symbols.

2. Mathematical Reasoning

Encouraging students to justify their answers and explain their thinking is central to Haylock's methodology. This includes:

- Using logical arguments to support solutions.
- Engaging in discussions about different problem-solving approaches.
- Developing critical thinking skills that enhance understanding.

3. Use of Manipulatives and Visual Aids

Haylock stresses the importance of using physical objects like counters, blocks, and number lines to help students visualize and internalize mathematical concepts. Visual aids such as diagrams, charts, and drawings further reinforce understanding.

4. Progression and Spiral Curriculum

His approach advocates for curriculum design that revisits key concepts multiple times with increasing complexity. This spiral approach ensures:

- Reinforcement of prior learning.
- Gradual introduction of more complex ideas.
- Building connections across different areas of mathematics.

Practical Applications of Derek Haylock's Mathematics Explained

Implementing Haylock's principles in the classroom involves various strategies and activities.

1. Lesson Planning Based on CPA

Effective lessons follow the concrete-pictorial-abstract sequence:

- Start with hands-on activities using manipulatives.
- Introduce visual representations like diagrams and models.
- Transition to abstract symbols and formal notation.

2. Emphasizing Mathematical Talk and Reasoning

Encourage students to:

- Explain their thinking aloud during problem-solving.

- Ask questions like “Why do you think that?” or “Can you find another way?”
- Participate in mathematical discussions to deepen understanding.

3. Differentiated Tasks and Resources

Use a variety of resources and task levels to cater to diverse learners:

- Use visual aids, manipulatives, and digital tools.
- Design tasks that challenge advanced learners while supporting others.
- Offer alternative ways for students to demonstrate understanding.

4. Formative Assessment and Feedback

Haylock emphasizes ongoing assessment to monitor understanding and inform instruction. Strategies include:

- Observing student work during activities.
- Asking probing questions.
- Providing timely feedback to guide learning progress.

The Impact of Derek Haylock’s Approach on Mathematics Education

His methodology has influenced curriculum development, teacher training, and classroom practices worldwide. Schools adopting his principles often report:

- Improved student engagement and confidence in mathematics.
- Better conceptual understanding leading to higher achievement.
- Enhanced problem-solving and reasoning skills.

Furthermore, his emphasis on inclusivity ensures that learners with diverse needs can access and succeed in mathematics.

Resources and Further Reading

For educators and parents interested in applying Derek Haylock's principles, consider exploring:

- His published books on mathematics teaching and learning.
- Curriculum guides that incorporate CPA and spiral progression.
- Professional development courses focused on Haylock's strategies.

Some of his notable publications include titles like "Understanding Primary Mathematics" and "Mathematics Explained", which delve deeper into his theories and practical applications.

Conclusion

Derek Haylock Mathematics Explained reveals a holistic, student-centered approach to teaching mathematics that emphasizes understanding, reasoning, and practical engagement. By integrating concrete experiences with visual and symbolic representations, educators can foster a love for mathematics and build strong foundational skills. Whether you're a teacher aiming to improve classroom practice or a parent supporting your child's learning, understanding Haylock's principles offers valuable insights into making mathematics accessible, meaningful, and enjoyable for all learners.

Frequently Asked Questions

Who is Derek Haylock and what is his contribution to mathematics education?

Derek Haylock is a renowned mathematics educator known for his work in developing effective teaching strategies and resources. His contributions include comprehensive textbooks and research that focus on improving mathematics understanding and teaching methods.

What are the main concepts covered in 'Derek Haylock Mathematics Explained'?

The book covers fundamental mathematical concepts such as number theory, algebra, geometry, data handling, and problem-solving strategies, all explained in an accessible manner for students and educators.

How does Derek Haylock approach explaining complex mathematical ideas?

Haylock emphasizes clear, step-by-step explanations, real-world applications, and visual aids to make complex ideas understandable and engaging for learners.

Is 'Derek Haylock Mathematics Explained' suitable for beginners or advanced students?

The book is primarily designed for beginners and intermediate learners, including teachers and students seeking a solid foundation in mathematics explained in a straightforward way.

What teaching methods does Derek Haylock recommend in his mathematical explanations?

Haylock advocates for active learning, use of visual aids, practical examples, and fostering critical thinking through problem-solving activities to enhance understanding.

Can 'Derek Haylock Mathematics Explained' help improve math teaching in classrooms?

Yes, the book provides practical strategies and explanations that can be used by teachers to enhance their instructional methods and improve student engagement and comprehension.

Are there any online resources or supplementary materials related to

Derek Haylock's work?

Yes, there are various online resources, including teaching guides, videos, and forums, that complement Haylock's work and help educators implement his methods effectively.

What are the key benefits of studying 'Derek Haylock Mathematics Explained'?

Studying this book helps learners develop a clearer understanding of mathematical concepts, improves problem-solving skills, and offers practical approaches for teaching and learning mathematics effectively.

How has Derek Haylock's approach influenced modern mathematics education?

His emphasis on clarity, practical application, and student-centered teaching has significantly influenced contemporary mathematics education, promoting more engaging and effective learning experiences.

Additional Resources

Derek Haylock Mathematics Explained: An In-Depth Analysis of Pedagogical Approaches and Content Delivery

Mathematics education has long been a subject of rigorous study and debate among educators, researchers, and policymakers. Central to this discussion is how mathematical concepts are conveyed to learners, ensuring not only understanding but also the development of critical thinking and problem-solving skills. Among the influential figures in this domain is Derek Haylock, whose contributions to mathematics education have shaped curricula, teaching strategies, and teacher training programs. This article aims to provide a comprehensive investigation into Derek Haylock Mathematics Explained, analyzing his pedagogical philosophies, the structure of his explanations, and the impact of his work on contemporary mathematics teaching.

Introduction to Derek Haylock and His Educational Philosophy

Derek Haylock has established himself as a prominent figure within the field of mathematics education, particularly within the UK and Commonwealth countries. His work is characterized by a focus on clarity, conceptual understanding, and the importance of making mathematics accessible to all learners. His publications and teaching resources emphasize active learning, reasoning, and the contextualization of

mathematical concepts.

Key aspects of Haylock's educational philosophy include:

- Constructivist Approaches: Belief that learners build their understanding actively rather than passively receiving information.
- Conceptual Focus: Prioritizing understanding of fundamental ideas over rote memorization of procedures.
- Scaffolded Learning: Structuring content progressively, allowing learners to develop confidence and mastery.
- Real-World Contexts: Connecting mathematical concepts to everyday life to enhance relevance and motivation.

The Structure of Haylock's Mathematical Explanations

Derek Haylock's explanations are distinguished by their clarity, logical progression, and emphasis on conceptual understanding. His approach typically involves a layered presentation that starts from concrete examples, moves through visual representations, and culminates in abstract formalization.

Core features of his explanatory style include:

1. Use of Visual Aids and Manipulatives: Incorporating diagrams, models, and physical objects to ground abstract concepts.
2. Step-by-Step Reasoning: Breaking down complex ideas into manageable steps, ensuring learners follow the logical flow.
3. Relating to Prior Knowledge: Connecting new ideas to familiar concepts to facilitate understanding.
4. Encouraging Active Engagement: Prompting learners to explore, question, and derive meaning through activities.

Deep Dive into Specific Mathematical Topics as Explained by Haylock

To appreciate the depth of Haylock's explanations, it is instructive to examine how he approaches key mathematical areas, such as number operations, algebra, and geometry.

Number and Place Value

Haylock emphasizes understanding the base-10 system through concrete materials like base-ten blocks and place value charts. His explanations often include:

- Visual representations: Demonstrating how units, rods, and flats combine to form numbers.
- Language and notation: Clarifying terminology such as ‘hundreds,’ ‘tens,’ and ‘units.’
- Relational understanding: Showing how numbers are composed and decomposed, fostering mental flexibility.

This approach encourages learners to see beyond algorithms, understanding why procedures work, which is fundamental for mastery.

Fractions and Decimals

His explanations for fractions involve:

- Sharing and partitioning activities: Using physical objects to illustrate division and parts of a whole.
- Number line models: Visualizing fractions and decimals as points on a continuum.
- Conversion techniques: Demonstrating how to move seamlessly between fractions, decimals, and percentages through contextual examples.

Haylock underscores the importance of conceptual clarity here, as misconceptions often stem from procedural misunderstandings.

Algebra and Symbolic Manipulation

In algebra, Haylock advocates for:

- Using concrete models: Such as algebra tiles or balance scales, to illustrate the properties of equations.
- Progressive abstraction: Moving from word problems to symbolic representation gradually.
- Functional understanding: Emphasizing the ‘why’ behind algebraic rules rather than rote memorization.

He stresses that understanding the logic of algebraic operations helps students develop flexible problem-solving skills.

The Pedagogical Strategies Promoted by Haylock

Derek Haylock's explanations are embedded within broader pedagogical strategies aimed at fostering deep understanding.

Key strategies include:

- Inquiry-Based Learning: Encouraging learners to explore, hypothesize, and test ideas.
- Use of Manipulatives and Visuals: Making abstract ideas tangible.
- Discussion and Reflection: Promoting classroom talk about mathematical reasoning.
- Differentiated Instruction: Tailoring explanations to meet diverse learner needs.
- Linking Mathematics to Real Life: Using practical problems to motivate and contextualize learning.

These strategies are supported by his writings and training materials, which serve as guides for effective mathematics instruction.

Impact and Critique of Haylock's Approaches

Positive impacts:

- Enhanced Conceptual Understanding: His methods have been shown to improve students' grasp of fundamental ideas.
- Teacher Confidence: Resources and frameworks have empowered teachers to deliver clearer explanations.
- Student Engagement: Contextual and interactive approaches increase motivation.

Critiques and Challenges:

- Resource Intensive: Implementation of manipulatives and visual aids can require significant preparation and materials.
- Curriculum Constraints: Standardized curricula may limit the depth of exploration Haylock advocates.
- Varied Learner Needs: While his approaches are inclusive, some students may require additional support beyond conceptual explanations.

Despite these challenges, Haylock's emphasis on clarity and understanding remains influential.

Relevance in Contemporary Mathematics Education

In an era where computational skills are vital, Haylock's focus on conceptual foundations ensures that learners do not merely memorize procedures but understand their origins and applications. His explanations align with current pedagogical trends emphasizing mathematical reasoning, problem-solving, and critical thinking.

Recent developments influenced by Haylock's principles include:

- Incorporation of digital manipulatives and dynamic geometry software.
- Emphasis on formative assessment to gauge conceptual understanding.
- Integration of real-world problem-solving in curricula.

His work continues to serve as a foundation for teacher training programs worldwide.

Conclusion: The Legacy of Derek Haylock's Mathematics Explained

Derek Haylock's approach to explaining mathematics has profoundly impacted how educators conceptualize teaching and learning. His emphasis on clarity, active engagement, and conceptual understanding offers a blueprint for effective instruction that remains relevant despite evolving educational landscapes.

By dissecting his pedagogical methods and content explanations, educators and researchers can better appreciate the importance of making mathematics accessible and meaningful. His legacy underscores that effective mathematical explanations are not just about conveying procedures but about nurturing understanding, curiosity, and confidence in learners.

In summary:

- Haylock's explanations are characterized by clarity, visual aids, and conceptual depth.
- His pedagogical strategies foster active learning and critical thinking.
- His influence persists in current educational practices and curriculum design.

As mathematics education continues to evolve, Haylock's principles serve as enduring guiding lights, reminding us that the ultimate goal is to cultivate mathematically literate individuals capable of reasoning, problem-solving, and appreciating the beauty of mathematics.

References:

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Note: This investigation underscores the importance of accessible explanations in mathematics education, highlighting Derek Haylock's influential role in shaping effective pedagogical practices.

Derek Haylock Mathematics Explained

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Derek Haylock, Ralph Manning, 2014-06-19 Get access to an interactive eBook* when you buy the paperback! (Print paperback version only, ISBN 9781446285879) A Unique Blend of Digital and Print Learning Resources! 5 Star student reviews: "A must have for teachers-to-be, especially those who are a bit shaky on their maths knowledge!" "Not many maths books keep me fixated but this is one that is definitely worth the money." "It is a book I will be using even when in the classroom." Mathematics Explained for Primary Teachers develops your understanding of mathematical concepts and processes, and how children learn them, so you can confidently teach mathematics to primary children. Tried and tested, the fifth edition of Derek Haylock's much loved textbook matches the 2014 curriculum requirements for England. Every chapter integrates children's learning, classroom practice, and teacher's own requirements for subject knowledge, making this the ideal text to guide you through your studies and beyond. More than just a book! The new edition is supported by FREE access to an interactive eBook and a companion website allowing you to use a wealth of teaching and learning resources. You can use the eBook to study where and when you want, and read, annotate and search the book on a tablet, laptop or PC. You can also visit study.sagepub.com/haylock5e to access: Videos by the author introduce core themes of each section and explain key mathematical processes. Links to the National Curriculum specify the statutory requirements for primary schools in England that relate to the mathematical content of each chapter. Learning and Teaching points highlight important issues you may face in the classroom and provide practical guidance for teaching. Self-assessment questions help check your understanding and provide immediate feedback to see how well you have done. Select SAGE journal articles to support literature reviews and wider reading. Lesson Plan Activities by Ralph Manning support content-focused chapters and contain creative mathematics tasks across the primary age range. A Student Workbook is also available to accompany this book, including over 700 practice problems to help you understand, apply and teach primary mathematics. Derek Haylock is an education consultant and writer with a background in mathematics teaching, teacher education and classroom-based research in mathematics education. Ralph Manning is an independent consultant in primary education. He has worked as a primary teacher and as a lecturer in primary teacher education for 18 years, following a career in IT. *interactivity only available through Vitalsource eBook

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students with an attractive and engaging means of reviewing, reinforcing and applying the material of *Mathematics Explained for Primary Teachers* Fourth Edition, chapter by chapter. The material in the workbook has been tested and endorsed by primary PGCE trainees. Detailed solutions and explanatory notes are provided at the end of the book for each task. The self-assessment tasks are of three kinds: - Checking Understanding Tasks designed to help the reader to check their own understanding of key concepts and principles and their mastery of important skills in each chapter. - Processes and Applications Tasks that provide opportunities to apply the mathematical content of each chapter in real-life situations, and in puzzles, problems, investigations and other mathematical challenges. - Teaching and Learning: tasks that provide opportunities for the reader to consider their responses to children's errors and misunderstandings, and to consider the content of each chapter in terms of approaches to teaching and learning in a primary school context.

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derek haylock mathematics explained: Mathematics Explained for Healthcare Practitioners Derek Haylock, Paul Warburton, 2013-01-11 If you find mathematics a struggle, or if mathematics makes you panic - whether you're a student preparing for a calculations test, or a qualified healthcare professional - this is the book for you. Its focus is first and foremost on helping you develop a proper and lasting understanding of mathematical concepts and processes in a healthcare context, with an emphasis on developing mental strategies to reinforce your feeling for number and numerical relationships. Clear, accessible chapters take you step-by-step through specific sets of objectives, and once you feel you have fully mastered a particular mathematical process, you're encouraged to practise your skills through a range of practical examples. Each chapter also contains a 'Spot the Errors' feature designed to reflect the busy, pressurised healthcare environment. Written by Derek Haylock, a best-selling mathematics educator, and Paul Warburton, co-ordinator of the Non-Medical Prescribing programme at Edge Hill University, the book is directly linked to the NMC's competencies and will give you the confidence to perform the safe, error-free calculations required of all healthcare professionals.

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and provides details of how each chapter of the book is linked to the National Curriculum. This will be updated to reflect any updates to the National Curriculum as they are introduced. Extensively used on primary PGCE courses and undergraduate courses leading to QTS, this bestselling book is an essential resource for all trainee primary teachers. Student Workbook The new companion workbook to Mathematics Explained for Primary Teachers provides students with an attractive and engaging means of reviewing, reinforcing and applying the material of Mathematics Explained for Primary Teachers 4th Edition, chapter by chapter. The material in the workbook has been tested and endorsed by primary PGCE trainees. Detailed solutions and explanatory notes are provided at the end of the book for each task. The self-assessment tasks are of three kinds: A. Checking Understanding Tasks designed to help the reader to check their own understanding of key concepts and principles and their mastery of important skills in each chapter. B. Processes and Applications Tasks that provide opportunities to apply the mathematical content of each chapter in real-life situations, and in puzzles, problems, investigations and other mathematical challenges. C. Teaching and Learning Tasks that provide opportunities for the reader to consider their responses to children's errors and misunderstandings, and to consider the content of each chapter in terms of approaches to teaching and learning in a primary school context.

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Derek Haylock, Anne D Cockburn, 2008-10-14 'This book is the ideal way to dispel some of the fears which surround the subject area of mathematics and should be an essential part of the professional development library of every early years setting provider for children aged three and over' - Early Years Update 'A book that is both readable and rigorous. [Its] guidance will help teachers to make

mathematics meaningful to young children. Throughout the book connections are made which relate language, symbols, concrete materials and pictures to the key ideas that are central to effective learning for the 21st century. This book will help teachers gain a depth of understanding that will make them confident in engaging children with real mathematical thinking' - Dr J.E. Anghileri, Senior Lecturer in Mathematics and Mathematics Education, Faculty of Education, University of Cambridge 'This is an updated version of a classic text which has been a best -seller among teachers and student teachers for many years. Being always strongly grounded in the classroom, it develops in a non-intimidating way teachers' own understanding of the mathematics they are teaching. Many insightful examples of children's thinking and appropriate activities help to illustrate the points. This is an essential book for teachers of Early Years and Key Stage 1' - Margaret Brown, Professor of Mathematics Education, King's College London, UK This is a fully revised version of the authors' successful and much-used book, *Understanding Mathematics in the Lower Primary Years*, updated to include the current Foundation Stage Curriculum and the new Primary Framework in England. The authors empower the reader to have a clearer understanding of the mathematical ideas behind the material they use in the classroom. They also show how children can be helped to develop an understanding of mathematics for themselves, rather than just learning recipes and routines with little meaning. Major themes are: - Understanding through making connections - Equivalence and transformation - Using and applying mathematics It is written for teachers and teacher trainees engaged in teaching mathematics to children aged 3 to 8 years. It is an essential student text and professional reference work for all teachers of children aged 3 to 8 years. Dr Derek Haylock is an education consultant and author, working in the field of mathematics education. His book *Mathematics Explained for Primary Teachers* has been a leader in the field for many years, with a third edition published in 2006. Dr Anne Cockburn is a Reader in the School of Education and Lifelong Learning at the University of East Anglia, Norwich. Watch the authors talking about their book here: YouTube

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derek haylock mathematics explained: Mastery in Primary Mathematics Tom Garry, 2020-02-06 Mastery in Primary Mathematics contains clear, practical guidance for both teachers and leaders on how to implement a mastery approach in the classroom that transcends any particular context, school type or scheme currently being used. Filled with research-based evidence, case studies and concrete examples of teaching for mastery used successfully, this is the ideal toolkit to implementing a mastery approach across a school, regardless of expertise. Moulding pupils into confident and successful mathematicians is one of the most important jobs of a primary school. It can also be one of the most difficult. Teaching for mastery gives pupils the best possible understanding of mathematics and implementing it involves a two-pronged approach: mastery must be embedded in the classroom, but will only work with the full support of the school's leadership team. Based on educational research and school case studies, Mastery in Primary Mathematics gives practical advice on introducing and sustaining teaching for mastery, with sections for both class teachers and school leaders. In this must-have guide, Tom Garry, NCETM Maths Mastery Specialist Teacher, covers the areas of variation theory, mathematical reasoning and the use of correct mathematical language, and equips leaders with the necessary tools to make the mastery approach work across a school. With a view to planning at three levels – curricular, unit and lesson – in order to fully arm educators with the means to plan effectively, Tom draws on cognitive science as current developments in this field are crucial to understanding how children learn.

derek haylock mathematics explained: Mathematical Understanding 5-11 Anne D Cockburn, 2007-06-19 Sam - a young and enthusiastic trainee teacher - asked the class, 'What is the difference between 7 and 6?'. Jo's hand shot up and he immediately responded, 'Well seven is all straight lines and sixes are all curly.' How can you help children to make progress in mathematical understanding? Children's mathematical misconceptions very often arise as a result of poor communication. This practical and innovative book presents a range of creative strategies to help teachers communicate effectively in the mathematics classroom, offering some new ways of presenting the fundamental concepts and principles of mathematics, and clearly demonstrating that the most effective form of communication is not always verbal. Each chapter focuses on a theme or concept central to the numeracy strategy, such as subtraction, shape and space, constructing and connecting 2D and 3D shapes, data-logging and graph interpretation, and mathematical reasoning. Each chapter supports teachers' subject knowledge as well as suggesting a range of communication strategies (e.g. speaking, listening, drawing, role play, and visual methods such as posters and ICT work) to help teachers and children to share and build on their understanding. All of the activities have been tried and tested in classrooms across Europe. Written by a team of highly experienced teachers, the book will be valuable reading for pre- and in-service teachers, teacher educators and anyone who has an interest in extending the ways children actively engage with mathematics. Teachers with EAL pupils in their class may find it of particular value in communicating mathematical concepts to those who find English difficult. The book is accompanied by a DVD which includes video clips of children at work in mathematics classrooms, software used in the project, copies of material from the book and additional activities.

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Rowland, Fay Turner, Anne Thwaites, Peter Huckstep, 2009-03-09 How can KS1/2 teachers improve their mathematics teaching? This book helps readers to become better, more confident teachers of mathematics by enabling them to focus critically on what they know and what they do in the classroom. Building on their close observation of primary mathematics classrooms, the authors provide those starting out in the teaching profession with a four-stage framework which acts as a tool of support for developing their teaching: - making sense of foundation knowledge - focusing on what teachers know about mathematics - transforming knowledge - representing mathematics to learners through examples, analogies, illustrations and demonstrations - connection - helping learners to make sense of mathematics through understanding how ideas and concepts are linked to each other - contingency - what to do when the unexpected happens Each chapter includes practical activities, lesson descriptions and extracts of classroom transcripts to help teachers reflect on effective practice.

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