

## Active Arithmetic Movement And Mathematics Teaching In The Lower Grades Of A Waldorf School By Henning Andersen 2014 03 13

This is a reader-friendly Waldorf 'taster' with three public lectures by Rudolf Steiner on Waldorf education and a thought-provoking, accessible introduction by a Waldorf teacher and longtime student of Steiner's pedagogy.

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

This book is a wonderful teacher resource for helping children learn to read. *The Word Mastery Primer* empowers teachers to organise sounds and words into families, and to invent picture-filled stories which bring the sounds of words and phonemes to life for children learning to read. The lovely short stories allow children to practise the sound families they've learned. This book has been used in manuscript form for teacher training in the Education Department at Antioch, New England, for many years. It's a gem of a reading primer, which has helped hundreds of teachers decide on the most memorable approach to putting sounds together with letters.

Designed for the one-term course in trigonometry, the Third Edition incorporates all of the many teaching and learning tools that have made Zill's texts a resounding success. A rich pedagogy and an extensive supplements package make this text a must-have resource for students and instructors alike. Zill takes care to include a full set of engaging and motivating features for students, including a wide range of word problems and specific applications, historical accounts of mathematicians, and a strong variety of relevant exercises. These extensive exercises give students the opportunity to test their comprehension, challenge their understanding, and apply their knowledge to real-world situations.

One sun, two parents, three meals a day, four seasons, five fingers ... every child soon discovers that lots of things in life have an inherent number attached to them. Just as five individual fingers become something much more important and powerful when combined together in a hand, these numbers are often much more than a simple addition of their parts: they are intrinsically connected to the object, expressing a particular quality. In this readable little book, Wolfgang Held explores the fascinating qualities of numbers one to thirty-one. The Pythagorean School in ancient Greece had a saying, 'all is number'. Held reveals the hidden numerical order of our world and our remarkable harmonic relationship with our surroundings. During over thirty years of teaching I have seen it confirmed, time and again, that young children have far more of a feeling and imaginative nature than they are little thinkers. The heart is the gateway to a child's mind and the story is the gateway to the heart. In play and in

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artistic work children integrate their experiences. To be able to learn in a playful, imaginative way, appropriate to their stage of development, cultivates and quickens the children's capacities, and lays the basis for the subsequent development of an intellect imbued with creative force. From the introduction to WORKING WITH LMNOP Multiplicando is a teaching story, an introduction to multiplication in its relation to other mathematical processes. It covers a key piece of the math curriculum, but, perhaps more importantly, it is intended to connect and integrate children's imaginative, physical and feeling life with their math learning experience. If we prove successful we will certainly find the children to have enthusiasm for future math learning. Unlike many stories, Multiplicando is not meant to be read all at once. Ideally it would be told in a series of lessons extending over several weeks, presented in conjunction with movement and artistic activities, as well as practice in the math processes involved. Teaching in this way presents a special opportunity to bring math teaching into the creative realm, with the wealth of potential benefits that this entails. Before beginning to tell the story, please be sure to look in the back of the book where you will find a special section "Using Multiplicando."

Why do even well-educated people understand so little about mathematics? And what are the costs of our innumeracy? John Allen Paulos, in his celebrated bestseller first published in 1988, argues that our inability to deal rationally with very large numbers and the probabilities associated with them results in misinformed governmental policies, confused personal decisions, and an increased susceptibility to pseudoscience of all kinds. Innumeracy lets us know what we're missing, and how we can do something about it. Sprinkling his discussion of numbers and probabilities with quirky stories and anecdotes, Paulos ranges freely over many aspects of modern life, from contested elections to sports stats, from stock scams and newspaper psychics to diet and medical claims, sex discrimination, insurance, lotteries, and drug testing. Readers of Innumeracy will be rewarded with scores of astonishing facts, a fistful of powerful ideas, and, most important, a clearer, more quantitative way of looking at their world.

Let's Challenge Your Smart Student! A super collection of more than 120 problems challenge your students in all areas of math—from basic arithmetic to algebra—while emphasizing problem-solving and critical thinking. It's the perfect refresher course on all math subjects we all encounter in our daily lives. The problems and the critical thinking questions in this book are prepared to challenge even the best students in the nation. This is also a problem-solving textbook for students in grades 5 - 12 who are preparing for advanced Math contests like the Harvard-MIT Mathematics Tournament. Written for the gifted math students, the new math coach, the teacher in search of problems and materials to challenge exceptional students, or anyone else interested in advanced mathematical problems. A strong foundation in pre-algebra is necessary before approaching most of the problems in this book. If your students could solve most of the problems in this book, they are definitely as smart as the world's smartest students. Help your student discover the most challenging aspects of MATH! What Are You Waiting For? Get this book now and help your SMART student enjoy learning Math today! Scroll to the top of the page and select the buy button. Published By: [www.effortlessmath.com](http://www.effortlessmath.com) This book offers insights into the history of mathematics education, covering both the current state of the art of research and the methodology of the field. History of mathematics education is treated in the book as a part of social history. This book grew out of the presentations delivered at the International Congress on Mathematics Education in Hamburg. Modern development and growing internationalization of mathematics education made it clear that many urgent questions benefit from a historical approach. The chapters present viewpoints from the following countries: Belgium, Brazil, Cambodia, China, Cyprus,

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Germany, Iceland, Italy, the Netherlands, Russia, Spain and Sweden. Each chapter represents significant directions of historical studies. The book is a valuable source for every historian of mathematics education and those interested in mathematics education and its development.

Susan Goldstein, Waldorf Teacher Pedagogical Mentor & Consultant Santa Cruz, CA USA Topics covered in WALDORF EDUCATION IN PRACTICE: BEFORE (What parents should know); WILLINGLY WORKING & GREEDILY LEARNING ; READING, SPELLING AND TALKING ON PAPER; MATH (The very beginning); IMAGE: The Heart of Waldorf ; PLAY-ACTING ; FOREIGN LANGUAGES ; And much more??

A collection of more than thirty articles shows teachers how to weave social justice principles throughout the math curriculum, and how to integrate social justice math into other curricular areas as well.

A New York Times bestseller John Urschel, mathematician and former offensive lineman for the Baltimore Ravens, tells the story of a life balanced between two passions For John Urschel, what began as an insatiable appetite for puzzles as a child developed into mastery of the elegant systems and rules of mathematics. By the time he was thirteen, Urschel was auditing a college-level calculus course. But when he joined his high school football team, a new interest began to eclipse the thrill he felt in the classroom. Football challenged Urschel in an entirely different way, and he became addicted to the physical contact of the sport. After he accepted a scholarship to play at Penn State, his love of math was rekindled. As a Nittany Lion, he refused to sacrifice one passion for the other. Against the odds, Urschel found a way to manage his double life as a scholar and an athlete. While he was an offensive lineman for the Baltimore Ravens, he simultaneously pursued his PhD in mathematics at MIT. Weaving together two separate narratives, Urschel relives for us the most pivotal moments of his bifurcated life. He explains why, after Penn State was sanctioned for the acts of former coach Jerry Sandusky, he declined offers from prestigious universities and refused to abandon his team. He describes his parents' different influences and their profound effect on him, and he opens up about the correlation between football and CTE and the risks he took for the game he loves. Equally at home discussing Georg Cantor's work on infinities and Bill Belichick's playbook, Urschel reveals how each challenge—whether on the field or in the classroom—has brought him closer to understanding the two different halves of his own life, and how reason and emotion, the mind and the body, are always working together. “So often, people want to divide the world into two,” he observes. “Matter and energy. Wave and particle. Athlete and mathematician. Why can't something (or someone) be both?”

This book contains a wealth of maths lessons for teachers of Years 1 to 6 in the Steiner-Waldorf curriculum. Moving through each year at a time, it covers numbers in Year 1, odds, evens and times-tables in Year 2, arithmetic in Year 3, fractions and squares in Year 4, decimals in Year 5, and percent and interest in

Year 6. All lessons are full of warmth and imagination, and offer wonderful approaches for teachers to try.

"One of the themes of the book is how to have a fulfilling professional life. In order to achieve this goal, Krantz discusses keeping a vigorous scholarly program going and finding new challenges, as well as dealing with the everyday tasks of research, teaching, and administration." "In short, this is a survival manual for the professional mathematician - both in academics and in industry and government agencies. It is a sequel to the author's *A Mathematician's Survival Guide*."--BOOK JACKET.

Ron Jarman believes there is a maths genius in every child and adult. Educators can use this comprehensive resource to teach math with imagination, laying the foundations for life. This resource helps educators develop confidence. It has been time tested for over 100 years by Waldorf teachers. Drawing number work from everyday life stimulates children's interest. Ron shows how children can easily grasp math principles, so that educators are relieved of endless worksheets. Uniquely, Ron draws on Pythagoras, the ancient Greeks and Rudolf Steiner for re-imagining the vital importance of mathematical learning for human growth. Chapters include an overview of the Waldorf Math Curriculum, math and personal development, math and education and what engages children at different stages of development. Chapters then cover the math learning journey from Grades 1-8, with tips, worked examples, exercises, questions and diagrams. This is both a theoretical and practical book giving a complete pathway to teaching children how to write and read in Classes 1 and 2. This book provides teachers with appealing, easy-to-use plans and practical activities for immediate use. It also sets out fundamental principles of Steiner Waldorf pedagogy. It shows how this dovetails with the best of both mainstream primary approaches and specialist dyslexia-friendly methods. Teachers can use these principles to become confident in creating their own activities and resources. The book showcases the holistic, creative aspects of the Steiner Waldorf literacy approach. The teaching of writing before reading is prioritized so as to engage children's creativity in learning. Developing the child's own voice through writing and storytelling, to lead over into reading, is highly effective for motivation and success.

This thoughtful book, written by an experienced Waldorf teacher in Denmark, explores ways of making arithmetic and maths lessons active, engaging and concrete for children. Anderson concentrates on methods which use aspects of movement and drawing to make maths 'real', drawing on children's natural need for physical activity and innate curiosity. The techniques discussed here will work well for younger classes in Steiner-Waldorf schools.

Longlisted for the National Book Award New York Times Bestseller A former Wall Street quant sounds an alarm on the mathematical models that pervade modern life -- and threaten to rip apart our social fabric We live in the age of the algorithm. Increasingly, the decisions that affect our lives--where we go to school,

whether we get a car loan, how much we pay for health insurance--are being made not by humans, but by mathematical models. In theory, this should lead to greater fairness: Everyone is judged according to the same rules, and bias is eliminated. But as Cathy O'Neil reveals in this urgent and necessary book, the opposite is true. The models being used today are opaque, unregulated, and uncontestable, even when they're wrong. Most troubling, they reinforce discrimination: If a poor student can't get a loan because a lending model deems him too risky (by virtue of his zip code), he's then cut off from the kind of education that could pull him out of poverty, and a vicious spiral ensues. Models are propping up the lucky and punishing the downtrodden, creating a "toxic cocktail for democracy." Welcome to the dark side of Big Data. Tracing the arc of a person's life, O'Neil exposes the black box models that shape our future, both as individuals and as a society. These "weapons of math destruction" score teachers and students, sort resumes, grant (or deny) loans, evaluate workers, target voters, set parole, and monitor our health. O'Neil calls on modelers to take more responsibility for their algorithms and on policy makers to regulate their use. But in the end, it's up to us to become more savvy about the models that govern our lives. This important book empowers us to ask the tough questions, uncover the truth, and demand change. -- Longlist for National Book Award (Non-Fiction) -- Goodreads, semi-finalist for the 2016 Goodreads Choice Awards (Science and Technology) -- Kirkus, Best Books of 2016 -- New York Times, 100 Notable Books of 2016 (Non-Fiction) -- The Guardian, Best Books of 2016 -- WBUR's "On Point," Best Books of 2016: Staff Picks -- Boston Globe, Best Books of 2016, Non-Fiction

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

existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and opportunities for teachers. A realistic look at the role of technology in education.

An inspirational and easy-to-use resource book for teachers who want to add interest and engagement to maths lessons. Part of the acclaimed Making Maths Meaningful series. The puzzles, games and activities in this book are designed to challenge students with new ways of applying core maths skills. Created by experienced maths teachers, with a focus on problem solving rather than solving problems, teachers will find activities to supplement all main maths topics -- from addition and subtraction to algebra and logic puzzles. Discover the perfect puzzle to inspire your class with this clear and easy-to-use resource. Fun with Maths Puzzles, Games and More includes:-- Puzzles -- categorised by age group and with full solutions-- Games -- engage the whole class or small groups with maths games that pupils will want to play again and again-- Maths magic tricks -- delight younger pupils and challenge older ones to figure out how they work-- Class activities -- practical exercises to bring maths into the real world This is a useful tool for Steiner-Waldorf teachers of Classes 4-12.

Accessible but rigorous, this outstanding text encompasses all of the topics covered by a typical course in elementary abstract algebra. Its easy-to-read treatment offers an intuitive approach, featuring informal discussions followed by thematically arranged exercises. This second edition features additional exercises to improve student familiarity with applications. 1990 edition.

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

Traditionally, small-group math instruction has been used as a format for reaching children who struggle to understand. Math coach Kassia Omohundro Wedekind uses small-group instruction as the centerpiece of her math workshop approach, engaging all students in rigorous "math exchanges." The key characteristics of these mathematical conversations are that they are: 1) short, focused sessions that bring all mathematical minds together, 2) responsive to the needs of the specific group of mathematicians, and 3) designed for meaningful, guided reflection. As in reading and writing workshop, students in Kassia's math

workshop are becoming self-directed and independent while participating in a classroom community of learners. Through the math exchanges, students focus on number sense and the big ideas of mathematics. Teachers guide the conversations with small groups of students, mediating talk and thinking as students share problem-solving strategies, discuss how math works, and move toward more effective and efficient approaches and greater mathematical understanding. Although grounded in theory and research, Math Exchanges is written for practicing teachers and answers such questions as the following: How can I use a math workshop approach and follow a certain textbook or set of standards? How should I form small groups? and How often should I meet with small groups? What should I focus on in small groups? How can I tell if my groups are making progress? What do small-group math exchanges look like, sound like, and feel like?

Waldorf education, an established and growing independent school movement, continues to be shaped and inspired by Rudolf Steiner's numerous lectures on education. In *Rhythms of Learning*, key lectures on children and education have been thoughtfully chosen from the vast amount of material by Steiner and presented in a context that makes them approachable and accessible. In his many discussions and lectures, Steiner shared his vision of an education that considers the spirit, soul, and physiology in children as they grow. Roberto Trostli, an experienced Waldorf teacher, has selected the works that best illustrate the fundamentals of this unique approach. In each chapter, Trostli explains Steiner's concepts and describes how they work in the contemporary Waldorf classroom. We learn how the teacher-child relationship and the Waldorf school curriculum changes as the students progress from kindergarten through high-school. This book will serve as an excellent resource for parents who want to understand how their child is learning. Parents will be better prepared to discuss their child's education with teachers, and teachers will find it a valuable reference source and communication tool.

In this well-illustrated book Hella Loewe describes her research and practice of working with modelling in the early years of a Steiner-Waldorf school. She describes meeting a class of mixed nationalities with social and behavioral challenges, and how she was able to temper this class through specific modelling techniques. Are the children coming into our classrooms today requiring more will-centered activities? Loewe believes this is so and challenges teachers to take a new look at the traditional Waldorf modelling curriculum through her re-examination of Rudolf Steiner's indications. Contents include: Modeling with Clay in the First Grade Step-by-Step Guide for Grades One through Three Practical Experiences About the Effects of Modeling with Clay Excerpts by Rudolf Steiner Regarding Sculptural Modeling

You had better not monkey around when it comes to place value. The monkeys in this book can tell you why! As they bake the biggest banana cupcake ever, they need to get the amounts in the recipe correct. There's a big difference

between 216 eggs and 621 eggs. Place value is the key to keeping the numbers straight. Using humorous art, easy-to-follow charts and clear explanations, this book presents the basic facts about place value while inserting some amusing monkey business.

For Waldorf teachers, math is often one of the more difficult subjects to teach. On the one hand, memories of our own schooldays can cloud our view of children's developmental needs, whereas on the other hand, Steiner's many indications do not form a cohesive structure for the math curriculum. Thus, many different ways of teaching were developed during the seventy-year history of Waldorf education. This diversity underscores the responsibility teachers carry for their lessons. This guide does not in any way intend to diminish this responsibility, but seeks to contribute to a unified view of Steiner indications for a developmentally appropriate math curriculum. Our approach may differ from some existing programs--mainly in its direct and quick beginning to math activities and its avoidance of pictures when introducing numbers to young students. There may be other differences as well.

Active Arithmetic! Movement and Mathematics Teaching in the Lower Grades of a Waldorf School

What is mathematics about? Is there a mathematical universe glimpsed by a mathematical intuition? Or is mathematics an arbitrary game of symbols, with no inherent meaning, that somehow finds application to life on earth? Robert Knapp holds, on the contrary, that mathematics is about the world. His book develops and applies its alternative viewpoint, first, to elementary geometry and the number system and, then, to more advanced topics, such as topology and group representations. Its theme is that mathematics, however abstract, arises from and is shaped by requirements of indirect measurement. Eratosthenes, in 200 BC, demonstrated the power of indirect measurement when he estimated the circumference of the earth by measuring a shadow at noon, in Alexandria, on the day of the summer solstice. Establishing geometric relationships, solving equations, finding approximations, and, generally, discovering quantitative relationships are tools of indirect measurement: They are the core of mathematics, the drivers of its development, and the heart of its power to enhance our lives.

Does your child struggle with learning spelling and reading? Are your students bored with weekly spelling lessons? If so, then this fun and straightforward approach to teaching spelling is for you! Waldorf schools aim to teach children academic skills by engaging their hands and heart, as well as their minds. In this concise booklet, the values of Waldorf education are merged with current research regarding how we most effectively learn spelling in order to offer a holistic approach to spelling instruction for Grades 1 through 8. The curriculum focuses on essential skills required for proficient spelling and presents many ideas for activities and games that help children learn. Teachers and parents who read this book will be able identify their child's key areas for spelling improvement



and provide their child with fun and meaningful opportunities for spelling practice towards mastery!

This easy-to-read summary is an excellent tool for introducing others to the messages contained in Principles and Standards.

How to Make Math Meaningful? That is one of the greatest challenges for math teachers, particularly in today's world! This Waldorf math curriculum guide provides a developmentally appropriate method for teaching math in grades one through five.

"Hell hath no fury like a mathematician whose child has been scorned by an education system that refuses to know better," Barry Garelick wrote in his first published article on math education in 2005. He has been at it ever since, and his focus has remained the same: why many of today's practices for teaching math are ineffective and often destructive. This collection brings together some of his best articles on math education over the past ten years. Garelick states: "In writing these articles, I often feel that I am explaining in detail why jumping out of an airplane without a parachute will result in death. And while I am heartened that my readers have found these articles useful, I am also disheartened when I hear the education establishment react with arguments that are tantamount to 'Oh but if you jump out of an airplane the right way, you can survive.'" Nevertheless there is a growing momentum in the U.S. against the well-intentioned but highly injurious nonsense that passes for math education. This collection of articles will assure those people who are convinced that it is being taught poorly that they are right. Reviews: "Barry Garelick is an invaluable source of clear-eyed analysis in a world of math education that is so often given over to fads, agendas, and assorted foolishness. Garelick approaches math instruction, curriculum, and reform with a studious expertise and a wry skepticism that is all too rare. His book will be a welcome resource for parents and teachers frustrated with math education and seeking hard-headed advice on what ought to be done differently." Frederick Hess, Director of Education Policy Studies at American Enterprise Institute "A teacher, a parent and a mathematics major, Garelick's first-hand accounts of his experiences navigating the world of math education are all too familiar to those of us who have experienced the negative impact of educational fads in mathematics classrooms. This book is a must read for parents, teachers and anyone who cares about the way math is taught in North American schools." Dr. Anna Stokke, associate professor of mathematics at the University of Winnipeg. "Barry Garelick's highly readable volume of essays uses a diverse set of critical lenses to trace the stories of--and convincingly impugn--math-instructional ideals and methods that have not yet come close to fulfilling their proponents' promises. Required reading for anyone growing weary of all the lagging results, faddish terminology, and upside-down approaches they see across American K-12 mathematics instruction." Eric Kalenze, author of "Education is Upside-Down" "Those who criticize traditional methods of teaching math are prone to spout wise-sounding homilies about the need to "teach children to think like mathematicians. Barry Garelick understands that if you want kids to think like a mathematician you need to teach them some math, not wait for them to discover basic procedures on their own. For those stubbornly committed to learning math through discovery, here's hoping they discover Garelick's book." Robert Pondiscio, Senior Fellow and Vice President for External Affairs, Thomas B. Fordham Institute Time tested for over 100 years by Waldorf teachers, this resource draws number work from everyday life to stimulate children's interest, and shows how children can easily grasp math principles, so that educators are relieved of endless worksheets. The implementation of the National Council of Teachers of Mathematics'"Curriculum and Evaluation Standards for School Mathematics" implies fundamental shifts in the teaching and learning of mathematics. Intended for those individuals who will be instrumental in the

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implementation of those changes--teachers, administrators, and parents--this document presents 10 ideas for transforming mathematics teaching and learning based on research and successful practical experience: (1) All students can and must learn mathematics, which should serve as a "pump," not a "filter"; (2) Teachers need to listen to students and incorporate into their instruction what they learn from listening; (3) Students learn mathematics best when they construct their own mathematical understanding; (4) Students need to learn more and different types of mathematics; (5) Mathematical discussion should be a daily part of classroom activity; (6) Teachers need to become "informed guides" to the learner; (7) Calculators, computers, and related technology can be effective tools in the teaching and learning of mathematics; (8) Students need shared learning experiences; (9) Curricular and pedagogical change in mathematics cannot occur without accompanying change in student assessment; and (10) Lasting change takes broad support. (Contains 14 references.) (MDH)

This book shows how problems can be the vehicle for learning mathematics itself, and presents a comprehensive pedagogy based on classroom discourse, assessment, critical and creative thinking.

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