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Mathematical thinking. How to develop it in the classroom.

Monographs on Lesson Study for Teaching Mathematics and Sciences 1. Hackensack, NJ: World Scientific (ISBN 978-981-4350-83-9/hbk; 978-981-4350-84-6/pbk; 978-981-4350-85-3/ebook). xix, 297 p. (2012).

This extraordinarily important monograph has the potential to make a significant positive contribution to elementary education. From the Preface: " ... For teachers: This book explains how to develop mathematical thinking in the elementary school classroom. It is especially written for elementary school teachers who are not math majors and wish to teach mathematics in interesting ways. For secondary school mathematics teachers, it will also be useful, because most of the examples are open-ended tasks which will be meaningful to kids and adults .... For researchers: This book provides you with a theory of mathematics education which has been developed with teachers through lesson study and shared by teachers in their daily teaching practices. This theory supports better reproduction of the mathematical class in order to develop children's mathematical thinking. It already has a wide range of evidence through the lesson studies during the last fifty years. You may recognize that developing the theory of mathematical thinking with schoolteachers in the context of lesson study Is also an innovation for mathematics education research, because it provides you with the methodology as in reproductive science." Part I: Mathematical thinking: theory of teaching mathematics to develop children who learn mathematics for themselves. Part II: Developing mathematical thinking with number tables: how to teach mathematical thinking from the viewpoint of assessment. Part II contains twelve exhaustively described lessons for grades one through six. Each lesson implements the promise in the title: How to develop mathematical thinking. The lesson plans include: indent=7mm

(1) Type of mathematical thinking to be cultivated,
(2) Grade taught,
(3) Preparation
(4) Overview of the lesson process
(5) Worksheet
(6) Lesson process – a table with teacher's activities, children's activities, and mathematical thinking/evaluation (assessment)/and attention,
(7) Summarization on the blackboard,
(8) Evaluation, and (for four lessons)
(9) Further development. The monograph was written by Shigeo Katagiri, who is the former president of the Society of Mathematics Education for Elementary Schools in Japan, and edited and translated by Masami Isoda, corepresentative of the APEC lesson study project. Isoda provides a 29 page introductory chapter.

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Classification: D40 C70 D80 F30
Keywords: lesson study; number tables; mathematical thinking; problem solving
http://ebooks.worldscinet.com/ISBN/9789814350853/toc.shtml