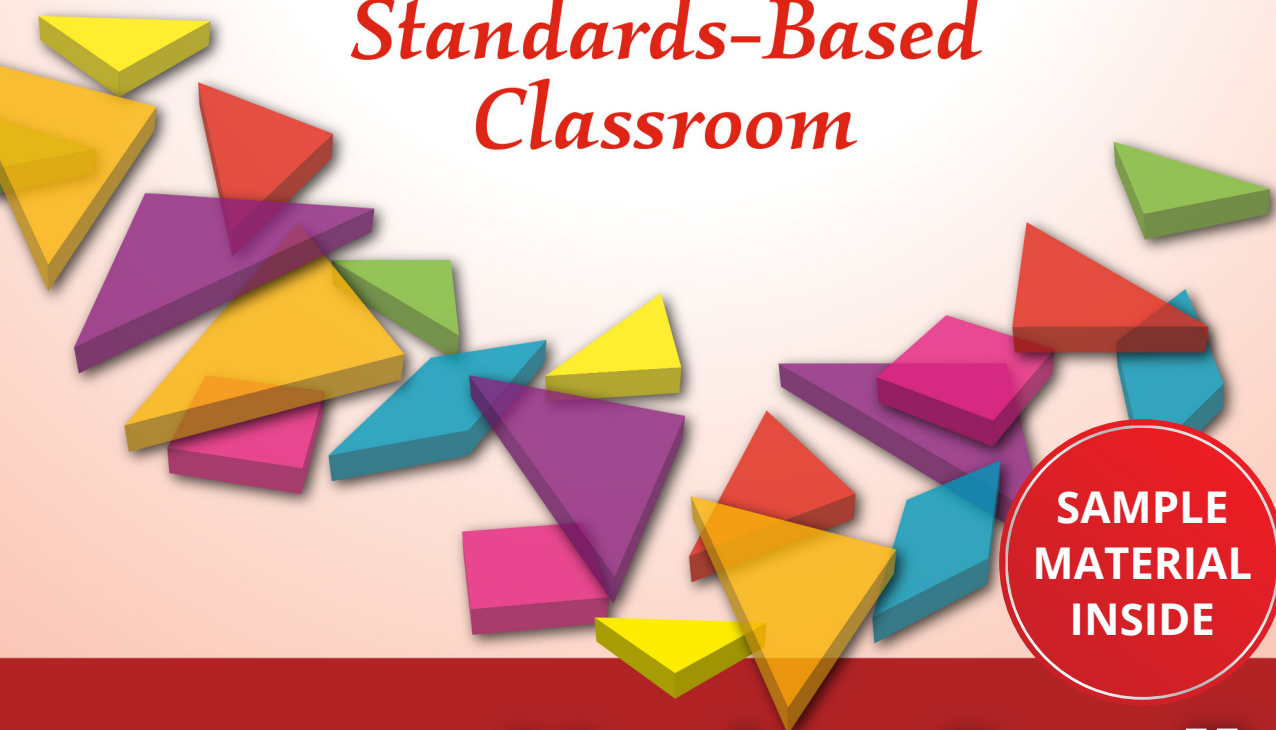


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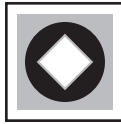
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Fourth Edition

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The “My Own Questions and Tasks” worksheet (see Appendix B) is available at tccpress.com

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Contents

Foreword, by Carol Ann Tomlinson	ix
Preface	xi
Organization of the Book	xi
Mathematical Practice Standards	xii
Changes in the Fourth Edition	xiii
Acknowledgments	xiv
Introduction: Why and How to Differentiate Math Instruction	1
The Challenge in Math Classrooms	1
What It Means to Meet Student Needs	3
Assessing Students' Needs	4
Principles and Approaches to Differentiating Instruction	4
Two Core Strategies for Differentiating Mathematics Instruction:	
Open Questions and Parallel Tasks	6
Creating a Math Talk Community	13
1 Counting & Cardinality and Number & Operations in Base Ten	17
Topics	17
The Big Ideas for Counting & Cardinality and for Number & Operations in Base Ten	18
Open Questions for Prekindergarten–Grade 2	19
Open Questions for Grades 3–5	28
Parallel Tasks for Prekindergarten–Grade 2	36
Parallel Tasks for Grades 3–5	43
Summing Up	48
2 Number & Operations—Fractions	49
Topics	49
The Big Ideas for Number & Operations—Fractions	50
Open Questions for Grades 3–5	51
Parallel Tasks for Grades 3–5	57
Summing Up	64

3	The Number System	65
	Topics	65
	The Big Ideas for The Number System	65
	Open Questions for Grades 6–8	66
	Parallel Tasks for Grades 6–8	70
	Summing Up	74
4	Ratios & Proportional Relationships	75
	Topics	75
	The Big Ideas for Ratios & Proportional Relationships	76
	Open Questions for Grades 6–8	76
	Parallel Tasks for Grades 6–8	84
	Summing Up	90
5	Operations & Algebraic Thinking	91
	Topics	91
	The Big Ideas for Operations & Algebraic Thinking	92
	Open Questions for Prekindergarten–Grade 2	93
	Open Questions for Grades 3–5	98
	Parallel Tasks for Prekindergarten–Grade 2	108
	Parallel Tasks for Grades 3–5	111
	Summing Up	116
6	Expressions & Equations and Functions	117
	Topics	117
	The Big Ideas for Expressions & Equations and for Functions	118
	Open Questions for Grades 6–8	118
	Parallel Tasks for Grades 6–8	128
	Summing Up	134
7	Financial Literacy	135
	Topics	135
	The Big Ideas for Financial Literacy	136
	Open Questions for Prekindergarten–Grade 2	137
	Open Questions for Grades 3–5	139
	Open Questions for Grades 6–8	143
	Parallel Tasks for Prekindergarten–Grade 2	147
	Parallel Tasks for Grades 3–5	149
	Parallel Tasks for Grades 6–8	151
	Summing Up	156
8	Measurement & Data	157
	Topics	157
	The Big Ideas for Measurement & Data	158
	Open Questions for Prekindergarten–Grade 2	159
	Open Questions for Grades 3–5	169

Parallel Tasks for Prekindergarten–Grade 2	181
Parallel Tasks for Grades 3–5	187
Summing Up	196
9 Geometry	197
Topics	197
The Big Ideas for Geometry	198
Open Questions for Prekindergarten–Grade 2	199
Open Questions for Grades 3–5	205
Open Questions for Grades 6–8	211
Parallel Tasks for Prekindergarten–Grade 2	224
Parallel Tasks for Grades 3–5	227
Parallel Tasks for Grades 6–8	231
Summing Up	240
10 Statistics & Probability	241
Topics	241
The Big Ideas for Statistics & Probability	242
Open Questions for Grades 6–8	243
Parallel Tasks for Grades 6–8	252
Summing Up	262
Conclusions	263
The Need for Manageable Strategies	263
Developing Open Questions and Parallel Tasks	264
The Benefits of These Strategies	266
Appendix A: Mathematical Practices Addressed in This Resource	267
Appendix B: Worksheet for Open Questions and Parallel Tasks	268
Glossary	270
Bibliography	280
Index	283
Index of Subjects and Cited Authors	283
Index of Big Ideas	286
About the Author	290



Preface

FOR THE PAST 15 years, I have had the opportunity to develop a number of resources that support teachers who seek to differentiate instruction in mathematics. Much of the work I do focuses on differentiation in terms of student readiness and highlights two strategies: open questions and parallel tasks.

These strategies have been employed effectively by thousands of teachers throughout Canada and the United States, as well as overseas. What we have learned is that to differentiate instruction in math, it is important for teachers to think about “bigger ideas,” as they do when teaching other subjects, rather than focus intensely on the usual very tight content pieces in mathematics that capture their attention.

ORGANIZATION OF THE BOOK

The introductory chapter of this resource describes the rationale for differentiating math instruction and explains the two principal strategies that are employed throughout the book: open questions and parallel tasks. Nine content chapters built around the typical organization of mathematical content standards used by many states—as well as a chapter focusing on the mathematics of financial literacy—then illustrate applications of these strategies, followed by a final concluding chapter, an appendix listing the mathematical practices addressed throughout the content work, an appendix containing a template for teachers wishing to develop their own materials, a glossary, a bibliography, and an index.

Chapters 1–10 focus on the following content topics.

- Counting & Cardinality / Number & Operations in Base Ten
- Number & Operations—Fractions (including decimals)
- The Number System
- Ratios & Proportional Relationships
- Operations & Algebraic Thinking
- Expressions & Equations / Functions
- Financial Literacy
- Measurement & Data
- Geometry
- Statistics & Probability

The content strands are not developed sequentially, so Chapters 1–10 can be approached in any order. Within each of the content chapters, a set of big ideas is described that underlies the increasingly sophisticated teaching of that content throughout the grades. In this edition, each question or task is tagged to one or more of those big ideas, as well as to applicable standards for mathematical practice. Alternative versions of practice standards or process standards are used in various jurisdictions. Those applied here are listed in Appendix A.

The suggested differentiating questions and tasks are organized according to the primary, elementary, and middle-level grade bands set out in many states' standards. The object of differentiation is to teach the same broad concepts to students at different developmental levels. The multilayered organization of material within Chapters 1–10 is intended to help make this possible.

Appendix B features a template worksheet that will assist teachers in developing their own materials in support of differentiated instruction through use of open questions and parallel tasks. An example of application of the worksheet appears in the Introduction.

The Glossary defines technical terms used throughout. Each word that appears in the Glossary is shown in boldface type at its first occurrence in the text, and each Glossary entry is annotated with the chapter and page number of the term's first occurrence.

The Bibliography highlights three types of resources: those that are referenced in other parts of the text, those that speak to the issues of teaching to big ideas and differentiating instruction, as well as a number of excellent sources for activities that can be used as-is or used as a starting point for creating open questions and parallel tasks.

The Index focuses on educational concepts—standards, student development, teaching methods and principles, and such—as opposed to mathematical concepts. To facilitate user access to the mathematical topics covered, an Index of Big Ideas is provided, listing all big ideas covered in the content chapters.

MATHEMATICAL PRACTICE STANDARDS

The eight standards for mathematical practice that were addressed in the third edition are also addressed in this edition. These practice standards reflect “processes” that should be elicited from students and goals for orienting and developing students as mathematical thinkers as content is learned.

Some of these practices may or may not be brought out, depending on how a teacher handles the presented questions or tasks, but others are implicit no matter what direction the discussion of the question or task takes.

For example, almost all of the questions and tasks posed in this book require students to make sense of them and persevere in solving them. This is true with open questions, which are often deliberately vague and require students to make sense of the question before they can choose the direction in which to go. This is also true with parallel tasks, where students are likely to try to make sense of both options to decide with which one to proceed.

Students are frequently asked to explain their rationale, requiring them to construct viable arguments. Ideally, teachers would encourage students to critique each other's reasoning, although that would not be implicit in the question itself.

A great many of the questions provided require students to reason, either abstractly or, in the case of number or measurement questions, quantitatively.

Some questions bring out the other practices: modeling, using appropriate tools strategically, attending to precision, looking for and making use of structure, and/or looking for and expressing regularity in repeated reasoning. There are fewer questions attending to precision in this particular resource than in others precisely because differentiation must often allow for varying levels of precision.

Listed with each question and task are the practice standards that are clearly evoked in the question or task. This does not mean that teachers might not also evoke others, depending on their approach to student responses or the student responses themselves.

CHANGES IN THE FOURTH EDITION

Readers familiar with the third edition of this book will note that there are about 60 new questions. The biggest change, though, is the inclusion of a new chapter on financial literacy. This is a topic formally addressed in only some states' standards, but is of value for all students.

Financial literacy is an interesting topic since there are both social issues and mathematical issues involved. Different jurisdictions may emphasize one over the other; this resource blends both, addressing essential understandings about both, although emphasizing the mathematics, since this *is* a mathematics resource. For example, one essential understanding focuses on different ways to show the same amount of money, while another focuses on the fact that financial decisions are based on considering many factors.

IT IS MY HOPE that teachers will embrace the two core strategies—open questions and parallel tasks—that are explained and demonstrated in this book, and find them, as I have, to be helpful to the many children who come into classrooms with highly differentiated mathematical preparation, skill, and confidence. Seeing a child who has been struggling in mathematics start to feel successful is an important goal in my teaching. I have seen the use of the strategies described in this volume make that happen over and over again.