

Contents

Acknowledgments xviii

Letter to K–2 Teachers xix

Letter to Elementary Principals xx

Letter to Mathematics Coaches xxi

Letter to Preservice College and University Instructors xxii

How to Use This Book xxiii

Part I. You Are the Architect of Your Classroom 1

Chapter 1. Surveying Your Site: Knowing Your Students 2

- Why Is It So Important to Know Your Students? 3
- What Is Prior Knowledge in Mathematics? 4
- What Do Access and Equity Really Mean? 5
- How Do Identity and Agency Influence Lesson Planning? 5
- What Do Culturally and Linguistically Diverse Students Need? 7
- What Do Students Living in Poverty Need? 9
- What Are Learning Needs? 10
- What Are the Common Themes? 12

Chapter 2. Your K–2 Blueprint: Planning Mathematics Lessons for Coherence, Rigor, and Purpose 14

- What Is Coherence? 15
- What Is Rigor? 16
- What Is the Purpose of a Lesson? 18
 - What Is Conceptual Understanding?* 18
 - What Is Procedural Fluency?* 19
 - What Is Transfer?* 20
- How Can You Ensure That You Plan Lessons for Coherence, Rigor, and Purpose? 21
- Lesson-Planning Template 22

Part II. Drafting Your K–2 Blueprint 25

Chapter 3. Laying Your Foundation: It Starts With Big Ideas, Essential Questions, and Standards 26

- What Are State Standards for Mathematics? 27
- What Are Essential Questions? 28
- What Are Process Standards? 29
- Building Unit Coherence 31
- Kindergarten Snapshot: Big Ideas, Essential Questions, and Standards 32
- First-Grade Snapshot: Big Ideas, Essential Questions, and Standards 33
- Second-Grade Snapshot: Big Ideas, Essential Questions, and Standards 34
- Under Construction 35

Chapter 4. Reinforcing Your Plan: Learning Intentions and Success Criteria 36

- What Are Learning Intentions? 37
- What Are Mathematics Learning Intentions? 37
- What Are Language and Social Learning Intentions? 38
 - Language Learning Intentions* 38
 - Social Learning Intentions* 39
- How Do You Communicate Learning Intentions With Students? 40
- What Are Success Criteria? 41
- How Do Learning Intentions Connect to the Success Criteria? 41
- When Should Learning Intentions and Success Criteria Be Shared With Students? 42
- Building Unit Coherence 43
- Kindergarten Snapshot: Learning Intentions and Success Criteria 44
- First-Grade Snapshot: Learning Intentions and Success Criteria 45
- Second-Grade Snapshot: Learning Intentions and Success Criteria 46
- Under Construction 47

Chapter 5. Deciding on Purpose: Why Are You Building This Lesson? 48

- What Is the Role of a Conceptual Understanding Lesson? 49
- What Is Procedural Fluency, and How Does It Build From a Conceptual Understanding Lesson? 57
- How Do You Know if You Need a Conceptual Understanding or Procedural Fluency Lesson? 60
 - How Do You Create a Transfer Lesson?* 61
- Building Unit Coherence 63
- Kindergarten Snapshot: Lesson Purpose 64
- First-Grade Snapshot: Lesson Purpose 65
- Second-Grade Snapshot: Lesson Purpose 66
- Under Construction 67

Chapter 6. Choosing Tasks: The Heart of a Lesson 68

- Why Are Tasks Important? 69
- What Is a Worthwhile Task? 69
 - Uses Significant Mathematics for the Grade Level* 69
 - Rich* 69
 - Problem Solving in Nature* 70
 - Authentic/Interesting* 70
 - Equitable* 70
 - Active* 70
 - Connects to the Process Standards* 70
 - High Cognitive Demand* 70
- How Do You Adapt Tasks? 72
- What Are Some Sources for Worthwhile Tasks? 73
- Building Unit Coherence 73
- Kindergarten Snapshot: Task Selection 74
- First-Grade Snapshot: Task Selection 75
- Second-Grade Snapshot: Task Selection 76
- Under Construction 77

Chapter 7. Choosing Materials: Representations, Manipulatives, and Other Resources 78

- What Is the Role of Representations in Mathematics Lessons? 79
- What Is a Manipulative? 82
- How Are Manipulatives Used? 84
- What Are Other Resources? 86
- Building Unit Coherence 87
- Kindergarten Snapshot: Material Selection 88
- First-Grade Snapshot: Material Selection 89
- Second-Grade Snapshot: Material Selection 90
- Under Construction 91

Chapter 8. Cementing the Cracks: Anticipating Student Thinking 92

- What Are Misconceptions, and Where Do They Come From? 93
- How Can You Plan to Minimize Misconceptions? 94
 - Formative Assessment* 95
 - Questioning* 96
 - Anticipating* 96
- Building Unit Coherence 97
- Kindergarten Snapshot: Student Thinking 98
- First-Grade Snapshot: Student Thinking 99
- Second-Grade Snapshot: Student Thinking 100
- Under Construction 101

Chapter 9. Framing the Lesson: Formats 102

- What Are Some Different Lesson Formats? 103
 - Four-Part Lesson Format* 103
 - Game Format* 104
 - Small-Group Instruction* 105
 - Pairs* 107
- Building Unit Coherence 107
- Kindergarten Snapshot: Lesson Format 108
- First-Grade Snapshot: Lesson Format 109
- Second-Grade Snapshot: Lesson Format 110
- Under Construction 111

Chapter 10. Evaluating Impact: Formative Assessment 112

- What Is Formative Assessment? 113
- What Are Specific Formative Assessment Techniques? 114
 - Observation* 115
 - Interview* 116
 - Show Me* 118
 - Hinge Questions* 118
 - Exit Tasks* 119
- Building Unit Coherence 121

Kindergarten Snapshot: Formative Assessment	122
First-Grade Snapshot: Formative Assessment	123
Second-Grade Snapshot: Formative Assessment	124
Under Construction	125

Part III. Pulling All the Pieces Together 127

Chapter 11. Planning to Launch the Lesson 128

What Is a Lesson Launch?	129
How Can You Launch a Problem-Solving Lesson?	129
<i>See, Think, and Wonder Lesson Launch</i>	129
<i>Notice and Wonder Lesson Launch</i>	131
<i>Numberless Word Problem Lesson Launch</i>	132
What Kinds of Lesson Launches Focus on Mathematics Concepts?	133
<i>One of These Things Is Not Like the Others</i>	133
What Are Number Routine Lesson Launches?	134
<i>Counting Jar</i>	135
<i>Number Paths and Number Lines</i>	135
<i>Number Talk</i>	136
What Do You Anticipate Students Will Do?	138
Building Unit Coherence	138
Kindergarten Snapshot: Launch the Lesson	139
First-Grade Snapshot: Launch the Lesson	140
Second-Grade Snapshot: Launch the Lesson	142
Under Construction	143

Chapter 12. Planning to Facilitate the Lesson 144

What Is Mathematical Communication?	145
How Do You Facilitate Meaningful Mathematical Discourse?	145
How Do You Plan for and Pose Purposeful Questions?	147
<i>Gathering Information</i>	147
<i>Probing Thinking</i>	148
<i>Making the Mathematics Visible</i>	149
<i>Encouraging Reflection and Justification</i>	149
<i>Engage With the Reasoning of Others</i>	150
How Do You Facilitate Productive Struggle?	151
How Do You Make Sure You Engage Students in the Process Standards as You Facilitate the Lesson?	153
Building Unit Coherence	153
Kindergarten Snapshot: Facilitate the Lesson	154
First-Grade Snapshot: Facilitate the Lesson	156
Second-Grade Snapshot: Facilitate the Lesson	158
Under Construction	160

Chapter 13. Planning to Close the Lesson 161

Why Do You Need Closure in a Lesson?	162
What Are Some Different Closure Activities?	162

Extended Closure	164
Building Unit Coherence	166
Kindergarten Snapshot: Close the Lesson	167
First-Grade Snapshot: Close the Lesson	168
Second-Grade Snapshot: Close the Lesson	169
Under Construction	170

Chapter 14. Surveying Your Results: Lesson Reflection 171

Why Is It Important to Reflect Upon Lessons?	172
What Kind of Reflection Cycle Supports Teacher Growth?	173
<i>Take Time for Reflection</i>	173
<i>Describe What Worked</i>	173
<i>Describe the Challenge</i>	174
<i>Leverage the Success to Address the Challenge</i>	174
<i>Conduct Your Teaching Experiment</i>	175

Epilogue 176

Appendix A: Complete Lesson Plans 177

Appendix B: Lesson-Planning Template 193

Appendix C: Further Reading/Resources 197

Appendix D: Glossary 199

References 203

Index 209

About the Authors 221



Visit the companion website at
resources.corwin.com/mathlessonplanning/k-2
for downloadable resources.