List of Videos  ix
Acknowledgments  xi
About the Authors  xiii

Introduction  1
  What Works Best  3
  What Works Best When  8
  The Path to Assessment-Capable Visible Learners in Mathematics  12
  How This Book Works  15

Chapter 1. Teaching With Clarity in Mathematics  21
  Components of Effective Mathematics Learning  27
  Surface, Deep, and Transfer Learning  28
  Moving Learners Through the Phases of Learning  32
    Surface Learning in the Kindergarten Through Second Grade Mathematics Classroom  34
    Deep Learning in the Kindergarten Through Second Grade Mathematics Classroom  36
    Transfer Learning in the Kindergarten Through Second Grade Mathematics Classroom  37
  Differentiating Tasks for Complexity and Difficulty  38
  Approaches to Mathematics Instruction  40
Checks for Understanding 42
Profiles of Three Teachers 43
  Adam Southall 43
  Calder McLellan 44
  Carol Busching 45
Reflection 46

Chapter 2. Teaching for the Application of Concepts and Thinking Skills 49

Mr. Southall and Number Combinations 50
  What Mr. Southall Wants His Students to Learn 53
  Learning Intentions and Success Criteria 54
  Activating Prior Knowledge 56
  Scaffolding, Extending, and Assessing Student Thinking 59
  Teaching for Clarity at the Close 60

Ms. McLellan and Unknown Measurement Values 67
  What Ms. McLellan Wants Her Students to Learn 69
  Learning Intentions and Success Criteria 70
  Activating Prior Knowledge 71
  Scaffolding, Extending, and Assessing Student Thinking 74
  Teaching for Clarity at the Close 76

Ms. Busching and the Ever-Expanding Number System 85
  What Ms. Busching Wants Her Students to Learn 87
  Learning Intentions and Success Criteria 88
  Activating Prior Knowledge 89
  Scaffolding, Extending, and Assessing Student Thinking 96
  Teaching for Clarity at the Close 97

Reflection 105

Chapter 3. Teaching for Conceptual Understanding 107

Mr. Southall and Patterns 108
  What Mr. Southall Wants His Students to Learn 110
Learning Intentions and Success Criteria 112
Activating Prior Knowledge 113
Scaffolding, Extending, and Assessing Student Thinking 116
Teaching for Clarity at the Close 116

Ms. McLellan and the Meaning of the Equal Sign 122
What Ms. McLellan Wants Her Students to Learn 123
Learning Intentions and Success Criteria 124
Activating Prior Knowledge 125
Scaffolding, Extending, and Assessing Student Thinking 130
Teaching for Clarity at the Close 131

Ms. Busching and the Meaning of Addition 139
What Ms. Busching Wants Her Students to Learn 140
Learning Intentions and Success Criteria 141
Activating Prior Knowledge 142
Scaffolding, Extending, and Assessing Student Thinking 147
Teaching for Clarity at the Close 152

Reflection 160

Chapter 4. Teaching for Procedural Knowledge and Fluency 161

Mr. Southall and Multiple Representations 162
What Mr. Southall Wants His Students to Learn 163
Learning Intentions and Success Criteria 165
Activating Prior Knowledge 166
Scaffolding, Extending, and Assessing Student Thinking 169
Teaching for Clarity at the Close 170

Ms. McLellan and Equality Conjectures 179
What Ms. McLellan Wants Her Students to Learn 181
Learning Intentions and Success Criteria 182
Activating Prior Knowledge 183
Scaffolding, Extending, and Assessing Student Thinking 186
Teaching for Clarity at the Close 188
Ms. Busching and Modeling Subtraction 194
  What Ms. Busching Wants Her Students to Learn 196
  Learning Intentions and Success Criteria 197
  Activating Prior Knowledge 198
  Scaffolding, Extending, and Assessing Student Thinking 202
  Teaching for Clarity at the Close 204

Reflection 211

Chapter 5. Knowing Your Impact:
Evaluating for Mastery 213

What Is Mastery Learning? 214
  Using Learning Intentions to Define Mastery Learning 215
  Establishing the Expected Level of Mastery 217
  Collecting Evidence of Progress Toward Mastery 219

Ensuring Tasks Evaluate Mastery 229

Ensuring Tests Evaluate Mastery 230

Feedback for Mastery 233
  Task Feedback 234
  Process Feedback 234
  Self-Regulation Feedback 239

Conclusion 240

Final Reflection 243

Appendices 245

A. Effect Sizes 245
B. Teaching for Clarity Planning Guide 250
C. Learning Intentions and Success Criteria Template 255
D. A Selection of International Mathematical Practice or Process Standards 256

References 259

Index 263
List of Videos

Introduction

Video 1  What Is Visible Learning for Mathematics?
Video 2  Creating Assessment-Capable Visible Learners

Chapter 1. Teaching With Clarity in Mathematics

Video 3  What Does Teacher Clarity Mean in K–2 Mathematics?

Chapter 2. Teaching for the Application of Concepts and Thinking Skills

Video 4  Activating Prior Knowledge in an Application Lesson
Video 5  Differentiation and Choice in an Application Lesson
Video 6  Exploration and Closure During an Application Lesson

Chapter 3. Teaching for Conceptual Understanding

Video 7  A Model for Structuring a Conceptual Lesson
Video 8  Student Modeling Through a Think-Aloud
Video 9  Using Guided Questions to Clarify and Extend Understanding
Video 10  Feedback Without Taking Over the Thinking
Video 11  Building Metacognition

Chapter 4. Teaching for Procedural Knowledge and Fluency

Video 12  Choosing the Right Task for Procedural Knowledge
Video 13  Setting the Stage for Procedural Learning
Video 14  Supporting Procedural Learning and Checking for Understanding

Video 15  Differentiating Procedural Learning

**Chapter 5. Knowing Your Impact: Evaluating for Mastery**

Video 16  Assessing Student Progress and Planning Next Steps

Video 17  Developing Conceptual Learning in a Buddy Lesson

**Note From the Publisher:** The authors have provided video and web content throughout the book that is available to you through QR (quick response) codes. To read a QR code, you must have a smartphone or tablet with a camera. We recommend that you download a QR code reader app that is made specifically for your phone or tablet brand.

Videos may also be accessed at resources.corwin.com/vlmathematics-k-2