

# Contents

## Acknowledgments xxiii

## Letter to Grades 6–8 Teachers xxv

## Letter to Middle School Principals xxvii

## Introduction xxix

- A Brief History of the Common Core xxix
- The Common Core State Standards for Mathematics xxix
- Instructional Shifts xxix
- Major Work of Grades 6–8 xxx
- Common Core Word Wall xxxi
- The Common Core Standards for Mathematical Practice xxxi
- Effective Teaching Practices xxxiii
- How to Use This Book xxxiv
- Reflection Questions xxxv

## Part 1. Ratios and Proportional Relationships

- Domain Overview 2
- Suggested Materials for This Domain 3
- Key Vocabulary 3

### Grade 6

- Cluster A: *Understand ratio concepts and use ratio reasoning to solve problems.* 6
- Sample Planning Page: Ratios and Proportional Relationships, Grade 6, Cluster A 12
- Planning Page 14

### Grade 7

- Cluster A: *Analyze proportional relationships and use them to solve real-world and mathematical problems.* 16
- Sample Planning Page: Ratios and Proportional Relationships, Grade 7, Cluster A 25
- Planning Page 27
- Reflection Questions: Ratios and Proportional Relationships 28

## Part 2. The Number System

- Domain Overview 30
- Suggested Materials for This Domain 31
- Key Vocabulary 31

### Grade 6

- Cluster A: *Apply and extend previous understandings of multiplication and division to divide fractions by fractions.* 33
- Cluster B: *Compute fluently with multi-digit numbers and find common factors and multiples.* 36
- Cluster C: *Apply and extend previous understandings of numbers to the system of rational numbers.* 42

Sample Planning Page: The Number System, Grade 6, Cluster C 50  
Planning Pages 52

## Grade 7

Cluster A: *Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.* 56

Sample Planning Page: The Number System, Grade 7, Cluster A 67  
Planning Page 69

## Grade 8

Cluster A: *Know that there are numbers that are not rational, and approximate them by rational numbers.* 70

Sample Planning Page: The Number System, Grade 8, Cluster A 74  
Planning Page 76

Reflection Questions: The Number System 77

## Part 3. Expressions and Equations

Domain Overview 80  
Suggested Materials for This Domain 81  
Key Vocabulary 81

## Grade 6

Cluster A: *Apply and extend previous understandings of arithmetic to algebraic expressions.* 84

Cluster B: *Reason about and solve one-variable equations and inequalities.* 91

Cluster C: *Represent and analyze quantitative relationships between dependent and independent variables.* 96

Sample Planning Page: Expressions and Equations, Grade 6, Cluster C 98  
Planning Pages 100

## Grade 7

Cluster A: *Use properties of operations to generate equivalent expressions.* 103

Cluster B: *Solve real-life and mathematical problems using numerical and algebraic expressions and equations.* 106

Sample Planning Page: Expressions and Equations, Grade 7, Cluster A 112  
Planning Pages 114

## Grade 8

Cluster A: *Work with radicals and integer exponents.* 116

Cluster B: *Understand the connections between proportional relationships, lines, and linear equations.* 122

Cluster C: *Analyze and solve linear equations and pairs of simultaneous linear equations.* 126

Sample Planning Page: Expressions and Equations, Grade 8, Cluster A 130  
Planning Pages 131

Reflection Questions: Expressions and Equations 134

## Part 4. Functions

Domain Overview 136  
Suggested Materials for This Domain 137  
Key Vocabulary 137

## Grade 8

Cluster A: *Define, evaluate, and compare functions.* 138

Cluster B: *Use functions to model relationships between quantities.* 142

Sample Planning Page: Functions, Grade 8, Cluster A	145
Planning Pages	147
Reflection Questions: Functions	149

## Part 5. Geometry

Domain Overview	152
Suggested Materials for This Domain	153
Key Vocabulary	153

### Grade 6

Cluster A: <i>Solve real-world and mathematical problems involving area, surface area, and volume.</i>	155
Sample Planning Page: Geometry, Grade 6, Cluster A	161
Planning Page	162

### Grade 7

Cluster A: <i>Draw, construct, and describe geometrical figures and describe the relationships between them.</i>	164
Cluster B: <i>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</i>	168
Sample Planning Page: Geometry, Grade 7, Cluster B	172
Planning Pages	174

### Grade 8

Cluster A: <i>Understand congruence and similarity using physical models, transparencies, or geometry software.</i>	176
Cluster B: <i>Understand and apply the Pythagorean Theorem.</i>	185
Cluster C: <i>Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</i>	189
Sample Planning Page: Geometry, Grade 8, Cluster A	191
Planning Pages	193
Reflection Questions: Geometry	196

## Part 6. Statistics and Probability

Domain Overview	198
Suggested Materials for This Domain	199
Key Vocabulary	199

### Grade 6

Cluster A: <i>Develop understanding of statistical variability.</i>	201
Cluster B: <i>Summarize and describe distributions.</i>	207
Sample Planning Page: Statistics and Probability, Grade 6, Cluster B	212
Planning Pages	214

### Grade 7

Cluster A: <i>Use random sampling to draw inferences about a population.</i>	216
Cluster B: <i>Draw informal comparative inferences about two populations.</i>	219
Cluster C: <i>Investigate chance processes and develop, use, and evaluate probability models.</i>	222
Sample Planning Page: Statistics and Probability, Grade 7, Cluster C	230
Planning Pages	232

## Grade 8

Cluster A: <i>Investigate patterns of association in bivariate data.</i>	236
Sample Planning Page: Statistics and Probability, Grade 8, Cluster A	242
Planning Page	244
Reflection Questions: Statistics and Probability	245

## Resources

Table 1. Standards for Mathematical Practice	248
Table 2. Effective Teaching Practices	251
CCSS Where to Focus Grade 6 Mathematics	253
CCSS Where to Focus Grade 7 Mathematics	254
CCSS Where to Focus Grade 8 Mathematics	255

## Reproducibles

Reproducible 1. Percent Wheel	258
Reproducible 2. Frayer Model	259
Reproducible 3. Net of a Cube	260
Reproducible 4. Example for MAD (Mean Absolute Deviation)	261

## Additional Resources 263

## About the Authors 265