



Contents

Introduction	ix
Chapter 1	
Making meaning for whole number addition and subtraction	1
Case 1	
Insects and spiders and counting on	3
Case 2	
Going up and down with numbers	6
Case 3	
Complexities of counting back.....	8
Case 4	
Missing part versus missing change	11
Case 5	
Valentine stickers	12
Case 6	
Finding the difference: Should I add or subtract?	16
Case 7	
Number line models for subtraction	23
Chapter 2	
Making meaning for multiplication and division.....	27
Case 8	
Bunnies and eggs	29
Case 9	
Building, floors, and rooms.....	34
Case 10	
Candy canes in packages	38
Case 11	
How do kids think about division?	40
Case 12	
Are these kids or seeds?.....	43

Contents

Chapter 3

When dividing doesn't come out evenly.....	47
--	----

Case 13

Can you divide 39 into 5?	49
---------------------------------	----

Case 14

Can you divide 39 into 5—revisited	52
--	----

Case 15

7 brownies, 4 people	57
----------------------------	----

Case 16

Zero is special; zero is nothing	60
--	----

Chapter 4

Greater than, less than, equal to	65
---	----

Case 17

Which is greater? How do you know?	67
--	----

Case 18

Discovering common denominators	71
---------------------------------------	----

Case 19

Equivalent fractions	75
----------------------------	----

Case 20

Today's number is 1	76
---------------------------	----

Case 21

Fraction flags.....	79
---------------------	----

Chapter 5

Combining shares, or adding fractions.....	83
--	----

Case 22

Sharing brownies or adding fractions.....	84
---	----

Case 23

How many ways can you add $\frac{1}{3}$ to $\frac{1}{4}$? Or interesting stuff happens!	91
--	----

Case 24

“Doling out” and fractions.....	94
---------------------------------	----

Chapter 6

Taking portions of portions, or multiplying fractions	97
---	----

Case 25

Clock faces and equivalence	98
-----------------------------------	----

Case 26

Multiplication of mixed numbers.....	100
--------------------------------------	-----

Case 27

What I want my students to understand about multiplication	104
--	-----

Chapter 7

Expanding ideas about division in the context of fractions.....	107
---	-----

Case 28

Who says that's not the right equation?

My own experience vs. students' thinking	108
--	-----

Case 29

Stretching elastic	111
--------------------------	-----

Chapter 8

Highlights of related research.....	115
by Lisa Yaffee	

Section 1

Modeling addition and subtraction	116
---	-----

Section 2

Numerical reasoning begins	118
----------------------------------	-----

Section 3

Modeling multiplication and division	119
--	-----

Section 4

Making meaning for multiplication and division	123
--	-----

Section 5

Encountering fractions in sharing situations	125
--	-----

Section 6

Understanding fractional amounts.....	129
---------------------------------------	-----

Section 7

Revising ideas for operations with fractions.....	133
---	-----

References.....	137
------------------------	-----