

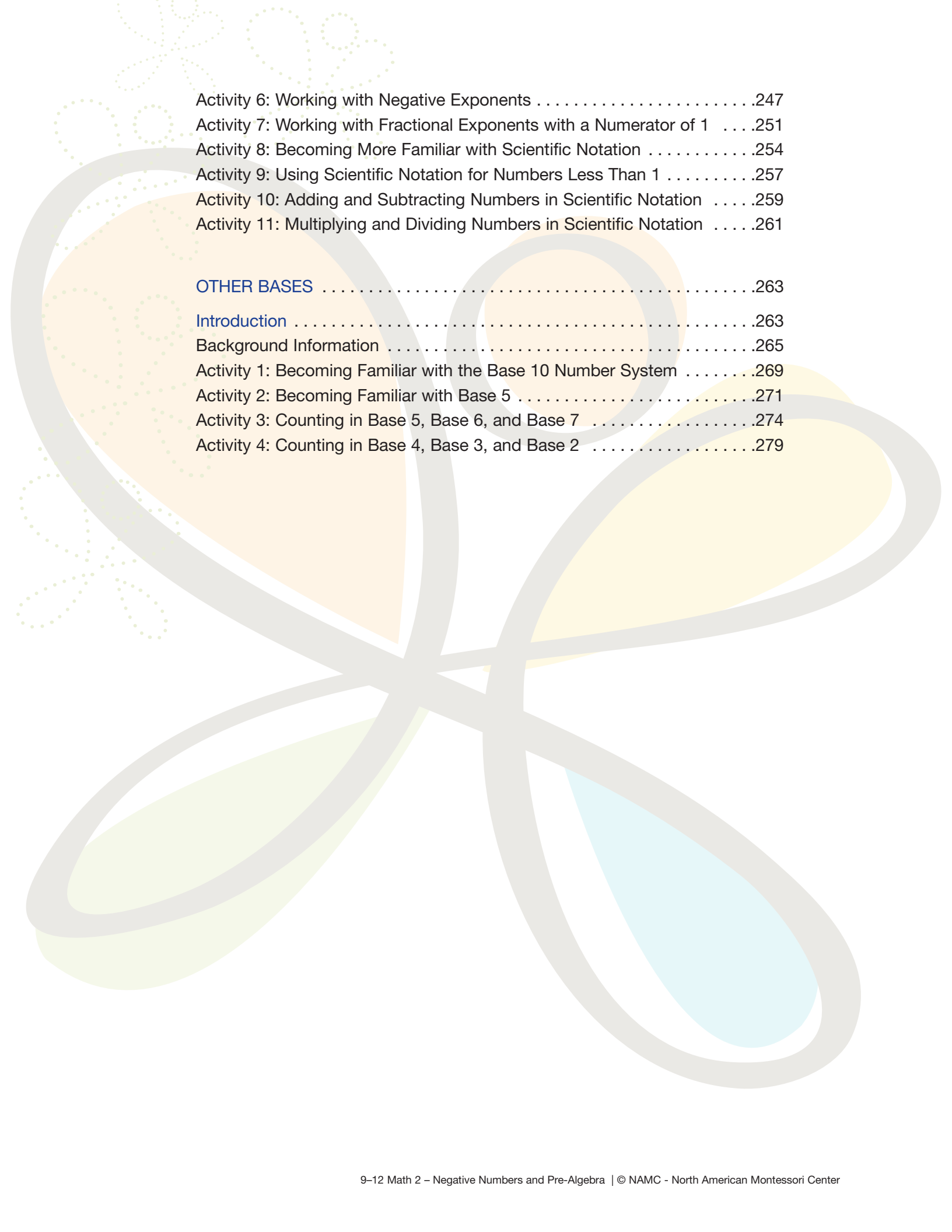


TABLE OF CONTENTS

HOW THIS MANUAL CAN BE USED	1
INTRODUCTION	4
NEGATIVE NUMBERS	6
Introduction	6
About Negative Numbers	10
Background Information	10
Activity 1: Understanding the Concept of Negative Numbers	12
Activity 2: Counting and Ordering Negative Numbers	15
Activity 3: Finding Equivalent Forms of Positive and Negative Numbers	18
Activity 4: Naming Additive Inverses for Positive and Negative Numbers	21
Operations with Positive and Negative Numbers	23
Background Information	23
Activity 1: Adding with Negative Numbers	26
Activity 2: Subtracting with Negative Numbers	29
Activity 3: Multiplying with Negative Numbers	32
Activity 4: Naming Reciprocals for Positive and Negative Numbers	35
Activity 5: Dividing with Negative Numbers	37
Activity 6: Simplifying Expressions with Multiple Operations and Positive and Negative Numbers	40
NON-TERMINATING DECIMALS AND IRRATIONAL NUMBERS	43
Introduction	43
Activity 1: Calculating Terminating and Non-Terminating Decimals	45
Activity 2: Recognizing Irrational Numbers	47
PRE-ALGEBRA	49
Introduction	49

Equations and Algebraic Equations	58
Background Information	58
Activity 1: Creating Simple Equations	62
Activity 2: Writing Equations and Using Negative Numbers in Equations	65
Activity 3: Using Variables to Represent Unknown Quantities in Equations	68
Activity 4: Solving Equations with One Variable	71
Activity 5: Solving Equations with Two Occurrences of the Same Variable	74
Activity 6: Solving Word Problems Using Equations with One Variable	77
Activity 7: Solving Word Problems Using Equations with Two Occurrences of One Variable	79
Squares of Numbers and of Polynomial Expressions	82
Background Information	82
Activity 1: Forming the Squares of the Numbers 1–10	88
Activity 2: Using the Distributive Property of Multiplication	92
Activity 3: Building the Square of a Binomial	95
Activity 4: Calculating the Square of a Binomial	99
Activity 5: Creating the Algebraic Expression for the Square of a Binomial	102
Activity 6: Squaring a Binomial Greater Than 10	105
Activity 7: Finding the Algebraic Expression for a Binomial Square Greater Than 10	109
Activity 8: Forming the Square of a Trinomial	113
Activity 9: Calculating the Square of a Trinomial Abstractly	117
Activity 10: Deriving the Algebraic Expression for the Square of a Trinomial	120
Activity 11: Building a Trinomial Square for Values Greater Than 100	122
Cubes of Numbers and of Polynomial Expressions	126
Background Information	126
Activity 1: Cubing Small Numbers	129
Activity 2: Forming the Cubes of Numbers 1–10	132
Activity 3: Building the Cube of a Binomial from the Square of a Binomial, Layer by Layer	135
Activity 4: Building the Cube of a Binomial from the Square of a Binomial, Part by Part	139
Activity 5: Developing the Algebraic Expression for the Cube of a Binomial	141

Activity 6: Building the Cube of a Binomial from the Algebraic Expression	144
Activity 7: Building the Cube of a Hierarchical Binomial from the Algebraic Expression	146
Activity 8: Building the Cube of a Trinomial from the Square of a Trinomial, Layer by Layer	149
Activity 9: Building the Cube of a Trinomial from the Square of a Trinomial, Part by Part	153
Activity 10: Developing the Algebraic Expression for the Cube of a Trinomial	156
Activity 11: Building the Cube of a Trinomial from the Algebraic Expression	159
Square Roots of Numbers	162
Background Information	162
Activity 1: Building Square Roots	166
Activity 2: Estimating Square Roots	169
Activity 3: Finding the Square Root of a Number with One Period	172
Activity 4: Finding the Square Root of a Number with Two Periods	175
Activity 5: Finding the Square Root of a Number with Two Periods Abstractly	180
Activity 6: Finding the Square Root of a Number with Three Periods	185
Activity 7: Finding the Square Root of a Number with Three Periods Abstractly	190
Activity 8: Finding Square Roots with Zero as Their Second Digit	196
Activity 9: Finding Square Roots with Zero as Their Third Digit	200
Cube Roots of Numbers	203
Background Information	203
Activity 1: Exploring the Concept of Cube Roots	207
Activity 2: Estimating Cube Roots	210
Activity 3: Finding the Cube Root of a Number with One Period	212
Activity 4: Finding the Cube Root of a Number with Two Periods	214
Activity 5: Finding the Cube Root of a Number with Two Periods Abstractly	217
Activity 6: Finding the Cube Root of a Number with Three Periods	222
Exponential and Scientific Notation	228
Background Information	228
Activity 1: Becoming Familiar with Exponential Notation	231
Activity 2: Adding with Exponents	235
Activity 3: Subtracting with Exponents	237
Activity 4: Multiplying with Exponents	239
Activity 5: Dividing with Exponents	243



Activity 6: Working with Negative Exponents . . . . .	.247
Activity 7: Working with Fractional Exponents with a Numerator of 1 . . . . .	.251
Activity 8: Becoming More Familiar with Scientific Notation . . . . .	.254
Activity 9: Using Scientific Notation for Numbers Less Than 1 . . . . .	.257
Activity 10: Adding and Subtracting Numbers in Scientific Notation . . . . .	.259
Activity 11: Multiplying and Dividing Numbers in Scientific Notation . . . . .	.261
OTHER BASES . . . . .	.263
Introduction . . . . .	.263
Background Information . . . . .	.265
Activity 1: Becoming Familiar with the Base 10 Number System . . . . .	.269
Activity 2: Becoming Familiar with Base 5 . . . . .	.271
Activity 3: Counting in Base 5, Base 6, and Base 7 . . . . .	.274
Activity 4: Counting in Base 4, Base 3, and Base 2 . . . . .	.279