

# Table of Contents

Foreword by Henry Kepner, NCTM President ..... v

Preface ..... vii

Introduction ..... 1

    Why Number and Numeration? ..... 1

    Understanding Number and Numeration ..... 2

    Big Ideas and Essential Understandings ..... 3

    Benefits for Teaching, Learning, and Assessing ..... 4

    Ready to Begin ..... 6

Chapter 1 ..... 7

Number and Numeration: The Big Ideas and Essential Understandings

    Big Idea 1 ..... 10

        Essential Understanding 1a ..... 10

        Essential Understanding 1b ..... 11

        Essential Understanding 1c ..... 15

        Essential Understanding 1d ..... 16

        Essential Understanding 1e ..... 17

    Big Idea 2 ..... 19

        Essential Understanding 2a ..... 19

        Essential Understanding 2b ..... 22

        Essential Understanding 2c ..... 25

    Big Idea 3 ..... 27

        Essential Understanding 3a ..... 27

        Essential Understanding 3b ..... 28

        Essential Understanding 3c ..... 29

        Essential Understanding 3d ..... 31

    Big Idea 4 ..... 32

        Essential Understanding 4a ..... 32

        Essential Understanding 4b ..... 33

        Essential Understanding 4c ..... 34

    Big Idea 5 ..... 35

        Essential Understanding 5a ..... 35

        Essential Understanding 5b ..... 36

        Essential Understanding 5c ..... 39

        Essential Understanding 5d ..... 39

Conclusion ..... 41

Chapter 2 .....	43
Connections: Looking Back and Ahead in Learning .....	
Addition and Subtraction .....	43
Multiplication .....	45
Rational Number .....	46
Early Algebraic Thinking .....	49
Conclusion .....	50
Chapter 3 .....	51
Challenges: Learning, Teaching, and Assessing .....	
Developing Counting .....	51
Number as a Foundation for Symbols and Representations .....	55
Number Understanding as a Basic for Conceptual Problems .....	57
Conclusion .....	58
References .....	59