Contents

Acknowledgments vii

Chapter 1. The Importance of Mathematics 1
   An Emerging Appreciation for Early Mathematics Learning 3
   Components of Mathematics 5
   About This Book 7

Chapter 2. General Teaching Strategies for Mathematics 13
   General Teaching Strategies 14
      Provide a wide variety of mathematics materials in every area of the classroom 14
      Converse with children using mathematics words and terms 18
      Encourage children to use mathematics to answer their own questions and solve their own problems 21
      Pose challenges that encourage mathematical thinking 23
   Key Developmental Indicators 26

Chapter 3. KDI 31. Number Words and Symbols 29
   How Knowledge About Number Words and Symbols Develops 30
      Cardinal numbers 30
      Ordinal numbers 31
      Number symbols (numerals) 32
   Teaching Strategies That Support Using Number Words and Symbols 33
      Use number words to describe everyday materials and events 33
      Call attention to numerals (number symbols) in the environment 34
      Encourage children to write numerals 35
   Ideas for Scaffolding KDI 31. Number Words and Symbols 37

Chapter 4. KDI 32. Counting 39
   Basic Principles of Counting 40
   How Counting Develops 41
   Factors That Support the Development of Counting 44
   Teaching Strategies That Support Counting 44
      Count and compare everything 44
      Provide materials to explore one-to-one correspondence 46
      Engage children in simple numerical problem solving 48
   Ideas for Scaffolding KDI 32. Counting 49

Chapter 5. KDI 33. Part-Whole Relationships 51
   The Meaning of Part-Whole Relationships in Mathematics 52
   How an Understanding of Part-Whole Relationships Develops 53
   Teaching Strategies That Support Understanding Part-Whole Relationships 55
      Provide materials that can be grouped and regrouped 55
      Provide materials that can be taken apart and put back together 56
   Ideas for Scaffolding KDI 33. Part-Whole Relationships 57

Chapter 6. KDI 34. Shapes 59
   The Importance of Shapes 60
   How Knowledge About Shapes Develops 62
   Teaching Strategies That Support Naming and Using Shapes 63
      Provide shapes for children to see and touch 63
      Encourage children to create and transform shapes and observe and describe the results 65
      Name shapes and the actions children use to transform them 66
   Ideas for Scaffolding KDI 34. Shapes 69
Chapter 7. KDI 35. Spatial Awareness  71
The Components of Spatial Awareness  72
How Spatial Awareness Develops  73
The Importance of Spatial Awareness  76
Teaching Strategies That Support Spatial Awareness  76
  Provide materials and plan activities that encourage children to create spaces  76
  Encourage children to handle, move, and view things from different perspectives  79
  Use and encourage children to use words that describe position, direction, and distance  81
Ideas for Scaffolding KDI 35. Spatial Awareness  83

Chapter 8. KDI 36. Measuring  85
Young Children’s Interest in Measuring  86
How Measurement Knowledge and Skills Develop  87
Teaching Strategies That Support Measuring  88
  Support children’s interest in identifying and comparing measurable attributes  88
  Encourage children to estimate quantities  90
  Use and encourage children to use measurement words  90
Ideas for Scaffolding KDI 36. Measuring  93

Chapter 9. KDI 37. Unit  95
The Importance of Unit in Measurement  96
How an Understanding of Unit Develops  97
Teaching Strategies That Support an Understanding of Unit  99
  Support children’s use of conventional and unconventional measuring tools  99
  Model accurate measuring techniques  100
Ideas for Scaffolding KDI 37. Unit  101

Chapter 10. KDI 38. Patterns  103
Children’s Early Experiences With Patterns  104
How Pattern Awareness Develops  105
Teaching Strategies That Support an Understanding of Patterns  106
  Provide opportunities for children to recognize and describe patterns in the environment  106
  Provide materials and opportunities that lend themselves to creating patterns  108
  Look for opportunities to have fun with patterns  109
Ideas for Scaffolding KDI 38. Patterns  111

Chapter 11. KDI 39. Data Analysis  113
The Importance of Data Analysis  114
How Data Analysis Knowledge and Skills Develop  115
Teaching Strategies That Support Data Analysis  117
  Provide opportunities to sort and count things and to describe and apply the results  117
  Help children represent data using lists, tabulations, charts, and graphs  118
  Ask and encourage children to ask questions that can be answered by gathering data  120
Ideas for Scaffolding KDI 39. Data Analysis  122

References  125