

Contents

Acknowledgments.....	vii
----------------------	-----

Introduction	1
--------------------	---

Chapter 1	Measurement in Early and Elementary Education.....	3
	<i>Douglas H. Clements, University of Denver</i>	
	<i>Jeffrey E. Barrett, Illinois State University</i>	
	<i>Julie Sarama, University of Denver</i>	

SECTION I

Chapter 2	Length: A Summary Report	25
	<i>Douglas H. Clements, University of Denver</i>	
	<i>Jeffrey E. Barrett, Illinois State University</i>	
	<i>Julie Sarama, University of Denver</i>	
	<i>Craig J. Cullen, Illinois State University</i>	
	<i>Douglas W. Van Dine, Metropolitan State University of Denver</i>	
	<i>Cheryl L. Eames, Southern Illinois University, Edwardsville</i>	
	<i>Melike Kara, Towson University</i>	
	<i>David Klanderman, Trinity Christian College</i>	
	<i>Maria Vukovich, The Center for Victims of Torture</i>	

SECTION II

Chapter 3	Area	71
	<i>Douglas H. Clements, University of Denver</i>	
	<i>Julie Sarama, University of Denver</i>	
	<i>Amanda L. Miller, Illinois State University</i>	

Chapter 4	Area in the Early Childhood and Primary Grades	83
	<i>Julie Sarama, University of Denver</i>	
	<i>Douglas H. Clements, University of Denver</i>	
	<i>Douglas W. Van Dine, Metropolitan State University of Denver</i>	
	<i>Maria Vukovich, The Center for Victims of Torture</i>	
	<i>Katherine Newburgh, University of Denver</i>	
	<i>Jennifer S. McDonel, Radford University</i>	
	<i>Lisa Napora, Daemen College</i>	

Chapter 5	Area in the Middle and Later Elementary Grades 105 <i>Jeffrey E. Barrett, Illinois State University</i> <i>Craig J. Cullen, Illinois State University</i> <i>Amanda L. Miller, Illinois State University</i> <i>Cheryl L. Eames, Southern Illinois University, Edwardsville</i> <i>Melike Kara, Towson University</i> <i>David Klanderman, Trinity Christian College</i>
Chapter 6	Integration of Results: A Revised Learning Trajectory for Area Measurement 129 <i>Jeffrey E. Barrett, Illinois State University</i> <i>Douglas H. Clements, University of Denver</i> <i>Julie Sarama, University of Denver</i> <i>Amanda L. Miller, Illinois State University</i> <i>Craig J. Cullen, Illinois State University</i> <i>Douglas W. Van Dine, Metropolitan State University of Denver</i> <i>Katherine Newburgh, University of Denver</i> <i>Maria Vukovich, The Center for Victims of Torture</i> <i>Cheryl L. Eames, Southern Illinois University, Edwardsville</i> <i>David Klanderman, Trinity Christian College</i>

SECTION III

Chapter 7	Volume 151 <i>Douglas H. Clements, University of Denver</i> <i>Julie Sarama, University of Denver</i> <i>Douglas W. Van Dine, Metropolitan State University of Denver</i>
Chapter 8	Volume in the Early Childhood and Primary Grades 159 <i>Douglas W. Van Dine, Metropolitan State University of Denver</i> <i>Douglas H. Clements, University of Denver</i> <i>Julie Sarama, University of Denver</i> <i>Jennifer S. McDonel, Radford University</i> <i>Lisa Napora, Daemen College</i>
Chapter 9	Volume in the Middle and Later Elementary Grades 181 <i>Craig J. Cullen, Illinois State University</i> <i>Jeffrey E. Barrett, Illinois State University</i> <i>Melike Kara, Towson University</i> <i>Cheryl L. Eames, Southern Illinois University, Edwardsville</i> <i>Amanda L. Miller, Illinois State University</i> <i>David Klanderman, Trinity Christian College</i>

Chapter 10	Integration of Results: A Revised Learning Trajectory for Volume Measurement	203
	<i>Douglas W. Van Dine, Metropolitan State University of Denver</i>	
	<i>Douglas H. Clements, University of Denver</i>	
	<i>Jeffrey E. Barrett, Illinois State University</i>	
	<i>Julie Sarama, University of Denver</i>	
	<i>Craig J. Cullen, Illinois State University</i>	
	<i>Melike Kara, Towson University</i>	

SECTION IV

Chapter 11	Reflections on the Design and Outcomes of the Research	223
	<i>Jeffrey E. Barrett, Illinois State University</i>	
	<i>Julie Sarama, University of Denver</i>	
	<i>Douglas H. Clements, University of Denver</i>	
	<i>Craig J. Cullen, Illinois State University</i>	
	<i>Douglas W. Van Dine, Metropolitan State University of Denver</i>	
References		245