Contents

Foreword
Delmo Della-Dora
Introduction
Leroy G. Callahan, Vincent J. Glennon
Part One: Studies Concerning the Curriculum
What are the main sources of the mathematics curriculum?
Did the "new math" curricula possess curricular (face) validity? Were they appropriate?
What does research that compared students in "new" and "traditional" programs seem to suggest?
What have we learned from the first National Assessment of Mathematics (NAEP)?
Was (Is) Sesame Street successful in teaching mathematics concepts to young children?
What about the IPI Math Program (Individually Prescribed Instruction)?
What is the place of behavioral objectives in determining the curriculum in elementary school mathematics?
What does the work of Piaget suggest about the cognitive development of the child?
What does the work of Piaget suggest for the curriculum in elementary school mathematics?
What does research on the specific relationship between elementary school mathematics and Piagetian tasks seem to suggest?
What are some implications for teaching from the work of Piaget?
What cautions and concerns have been expressed about applying Piagetian theory to mathematics education?

What is the influence of schooling in different cultures of ability to conserve and estimate number?	n the
What kind of mathematics program for the kindergarter	n?
How soon should we teach "basic concepts" of mathem in the elementary school?	natics
What is the appropriate scope and sequence for the geor program in the elementary school?	metry
What are some of the possible implications for education the United States moves toward adoption of the metr system of measurement—Système International (S.I.)	rie.
What does research suggest about geometry in the eleme school?	ntary
Can children learn the elements of mathematical logic?	
Do summer educational programs for the disadvantaged succeed?	
What was learned about achievement in mathematics from the International Study?	m
How do children in the United States compare with child	1
of other countries on mathematics achievement tests?	
of other countries on mathematics achievement tests? Part Two: Studies Concerning the Child	
of other countries on mathematics achievement tests?	
of other countries on mathematics achievement tests? Part Two: Studies Concerning the Child What mathematical knowledge do children have on enteschool? What are some variables which may affect mathematical	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on ente school? What are some variables which may affect mathematica performance of children entering kindergarten?	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on ente school? What are some variables which may affect mathematical performance of children entering kindergarten? What is the sequence of development of early number	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on enterschool? What are some variables which may affect mathematical performance of children entering kindergarten? What is the sequence of development of early number behaviors?	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on ente school? What are some variables which may affect mathematica performance of children entering kindergarten? What is the sequence of development of early number behaviors? What contributes to readiness in learning mathematics? Does cultural deprivation have a lasting effect on mathem	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on enterschool? What are some variables which may affect mathematical performance of children entering kindergarten? What is the sequence of development of early number behaviors? What contributes to readiness in learning mathematics? Does cultural deprivation have a lasting effect on mathemachievement? Do ethnic groups differ in patterns of mental abilities	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on enterschool? What are some variables which may affect mathematical performance of children entering kindergarten? What is the sequence of development of early number behaviors? What contributes to readiness in learning mathematics? Does cultural deprivation have a lasting effect on mathemachievement? Does the age at which a child enters first grade have an effect on subsequent achievement in elementary school	ering
Part Two: Studies Concerning the Child What mathematical knowledge do children have on enterschool? What are some variables which may affect mathematical performance of children entering kindergarten? What is the sequence of development of early number behaviors? What contributes to readiness in learning mathematics? Does cultural deprivation have a lasting effect on mathemachievement? Do ethnic groups differ in patterns of mental abilities such as number facility and space conceptualization? Does the age at which a child enters first grade have an	ering al

How can we best group children for learning mathematics?	. 94
How can mathematics class time be used most effectively?	95
Does class size affect student achievement in elementary school mathematics?	97
What about the readability of arithmetic textbooks?	98
Do children learn more mathematics in good schools than in poor schools?	99
Is the mathematical training of elementary school teachers adequate?	100
Is the "professional" preparation of teachers of elementary school mathematics adequate?	102
How effective is in-service education?	104
"Teaching Centers"—What is the promise and potential?	106
What are some guidelines for determining performance criteria in the professional preparation of math teachers?	107
Part Four: Studies Concerned with Teaching Method	109
What are the main sources of the teacher's methods?	
What does the research on discovery learning suggest?	113
How is mathematics learning motivated?	115
What are some considerations in choosing physical (concrete) models in elementary mathematics instruction?	118
What has research suggested about the effectiveness of physical (concrete) models in facilitating math learning?	122
What part does teacher-student verbal interaction play in classroom instruction?	123
What is the effect of homework?	124
What emphasis on computational proficiency?	124
What is the place of the hand-held calculator in the elementary, middle, and junior high school?	125
What is the place of practice (drill) in the contemporary mathematics program?	126
How do we diagnose learning problems in elementary school mathematics?	128
How should we evaluate learning in elementary school mathematics?	130

to number facts?

mathematics?

What effect does the teaching of non-decimal numeration systems have on learning of topics in elementary school

What about CAI (Computer Assisted Instruction) in

How can we improve ability to solve verbal problems? _____ 145

References ______151

Index _____ 182

elementary school mathematics instruction? ______149