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ABSTRACT

Presented is a second supplement to previous lists of references. This document is a compilation of information collected by the Calculator Information Center between December 1980 and March 1982. Included are references which previously appeared on bulletins distributed by the center, plus articles from newsletters and similar less readily available sources and from non-American sources. Most references are annotated; all include a limited set of descriptors or keywords which denote the focus or contents of the reference. At the end of the listing is an index for each descriptor. (MP)

Calculators:

A Categorized Compilation of References

Supplement 2

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March 1982

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Table of Contents

Calculators: A Categorized Compilation of References

Since March 1977, the Calculator Information Center has met the dual functions of collecting and disseminating information about the use of calculators in education. This document lists references collected by the Center between December 1980 and March 1982, supplementing two previous compilations (Suydam, 1979, 1980). The majority of these references have appeared on Reference Bulletins distributed by the Center. Two additional types of materials cited here did not appear in those bulletins:

(1) Articles from sources not readily available to wide audiences.

(2) Articles and other documents from non-American sources.

No claim to comprehensiveness is made: readers are encouraged to send additional references to the Center. Omitted are approximately 350 references pertaining to applications which seem too specialized in intent for use in schools.

The alphabetized listing of references includes, in parentheses, a limited set of descriptors or keywords which denote the focus or contents of the references. At the end of the listing is an index to help the reader locate documents of interest. However, some descriptors which could have been applied to a particular reference might not be listed. Such omissions generally occurred because the descriptor did not come to mind as the reference was scanned. It is suggested that readers might add their own notes of references appropriate in each category.

In the majority of instances, the references are annotated. In a small percentage of cases, however, no annotation is included; this occurred most often because the document was not available at the Center. The descriptors should reflect what is known about the contents of such documents, as indicated by the title.

It is hoped that this compilation will be of aid to teachers, to researchers, and to others who need and want references on calculators.

References

Suydam, Marilyn N. Calculators: A Categorized Compilation of References. Columbus, Ohio: Calculator Information Center, June 1979. Available for purchase from the ERIC Clearinghouse for Science, Mathematics and Environmental Education. See also ERIC: ED 171 152.

Suydam, Marilyn N. Calculators: A Categorized Compilation of References. Columbus, Ohio: Calculator Information Center, December 1980. ERIC: ED 199 087.

Calculators: A Categorized Compilation of References
(Compiled December 1980-March 1982)

Abdelsamad, Omer Elfaroug Hamza. Improved Student Problem-Solving Procedure with the Calculator as Validated by Mathematics Experts. (University of Denver, 1980.) Dissertation Abstracts International 41A: 3462-3463; February 1981.

Problem-solving strategies were designated for each of the four steps in a problem-solving procedure (14, 32, 4, and 10 strategies, respectively). A questionnaire designed to determine the effective use of calculators in problem solving was completed by 53 mathematics teachers. The calculator was found to be effective for 13 strategies. Overall, the calculator was more effective for carrying out the plan than for understanding the problem.

(Problem solving, Research (survey), Secondary, Teachers)

Abo-Elkhair, Medhat El-Sayed Mahrous. An Investigation of the Effectiveness of Using Minicalculators to Teach the Basic Concepts of Average in the Upper Elementary Grades. (The Florida State University, 1980.) Dissertation Abstracts International 41A: 2980; January 1981.

Two fourth-grade classes were randomly assigned to either a calculator or a non-calculator group, each taught concepts of average. Significant differences on the posttest favored the calculator group. The calculator was an advantage in avoiding computational errors.

(Achievement, Elementary (grade 4), Four-function calculators, Research, Statistics)

Adkins, Bryce E. Using a Calculator to Find the "Greatest Common Factor". School Science and Mathematics 81: 603-606; November 1981.

Procedures are presented for using the hand-held calculator to find the greatest common factor and the least common multiple.

(Algorithms, Four-function calculators)

Adler, David A.; Oberman, Arlene; and Oberman, Marv. Calculator Fun. New York: Watts, 1981.

(Games)

Albina, Melvis Ann. The Effects of Using Two Types of Calculating Devices on the Computational Skills of Selected Third and Fourth Grade Students. (The University of Akron, 1981.) Dissertation Abstracts International 42A: 1038; September 1981.

Twenty-seven third and fourth grade students with learning disabilities were randomly assigned to one of three experimental groups: a group using four-function calculators, a group using preprogrammed feedback calculators, or a control group. The two calculator groups met for 20 minutes per day for 20 school days outside regular curriculum time. They used the calculators to practice basic facts. The four-function calculator group's performance was significantly better than the other two.

(Elementary (grades 3-4), Learning disabilities, Remedial, Research)

Allen, Steven. Math Skills Requirement of the Financial Industries. Journal of the CUNY Mathematics Discussion Group 7, 1980.

A vice-president of Chase Manhattan Bank discusses the need for calculator skills, and a calculator approach to algebra.

(Post-secondary)

Allenbrand, Bob et al. (Eds.). Course Goals in Computer Education, K-12. Portland, Oregon: Tri-County Goal Development Project, 1979. ERIC: ED 194 074.

Goals involving calculators are included.

(Curriculum, Elementary, Problem solving, Programming, Related (computers), Scientific calculators, Secondary)

Antipov, I. N. The Basic Calculation Methods by Pocket Calculator Elektronika B3-18A. Moscow: Vishave Shkola, 1980.

(Activities)

Ash, Peter and Robinson, Edward. Basic College Mathematics: A Calculator Approach. Reading, Massachusetts: Addison-Wesley, 1981.

This book is designed for a college mathematics course, with calculator use integrated.

(Basic mathematics, College, Scientific calculators)

Bailey, John F. Electronic Calculators and the Multiply Handicapped. Educational Research 23: 65-66; November 1980.

Training physically and mentally handicapped students ages 8-16 to use a calculator is described and the positive outcomes of this study are cited.

(Calculator keys, Curriculum, Desk calculators, Elementary, Four-function calculators, Handicapped, Junior high, Research, Secondary)

Bailey, P. A. Programmable Calculating Machines. Mathematics Teaching 66: 30-31; March 1974.

Important features that need to be considered when selecting a programmable calculator for classroom use are discussed. In addition, ten possible uses of programmable calculators in secondary schools are suggested.

(Programmable calculators, Secondary, Selection)

Barelski, Paul M. Use of a Photocopied Slide Rule to Complement Limited Function Calculators. Journal of Chemical Education 58: 718; September 1981.

The use of a slide rule is suggested to complement a four-function calculator. An inexpensive method of making a slide rule with photocopied scales is described.

(Recommendations)

Behr, Merlyn J. and Wheeler, Margariete Montague. The Calculator for Concept Formation: A Clinical Status Study. Journal for Research in Mathematics Education 12: 323-338; November 1981.

Teaching young school children to use the "=" key as a counter button is explored.

(Elementary (k-1), Four-function calculators, Research (survey))

Bentley, Ernest (Ed.). Programmable Calculators and Minicomputers in Agriculture: A Symposium Exploring Computerized Decision-Making Aids. 1980. ERIC: ED 206 272.

Uses of calculators (and computers) in agriculture and agricultural education are presented.

(Agriculture)

Bestgen, Barbara J. Calculators - Taking the First Step. Arithmetic Teacher 29: 34-37; September 1981.

A step-by-step plan for introducing calculators in grades one through six is outlined. It includes a sequence of activities.

(Activities, Attitudes, Elementary (grades 1-6))

Birnbaum, Ian. Powers and Roots on a Calculator. Mathematics Teaching 94: 48; March 1981.

Methods of calculating any power or root of a number using only the x^2 and $\sqrt{x}$ keys are illustrated.

(Calculator keys, Powers, Roots, Scientific calculators, Secondary)

Bitter, Gary. Calculator Corner: Dividing with the Calculator. Teacher 98: 101; January 1981.

Several activities are presented that illustrate how calculators can help children understand division concepts. Remainders, estimating, and figuring averages are also discussed.

(Activities, Calculator keys, Elementary, Four-function calculators, Teachers)

Bitter, Gary. Calculator Corner: Place Value Activities. Teacher 98: 98; February 1981.

Using the calculator to reinforce place value concepts is described.

(Activities, Elementary, Place value, Teachers)

Bitter, Gary. Calculator Corner: Computing Percentages with the Calculator. Teacher 98: 89; March 1981.

This article describes how the calculator can be used to find the total sale price of an item (including tax) and annual or compund interest on a savings account.

(Activities, Calculator keys, Consumer applications, Elementary, Junior high, Teachers)

Bitter, Gary. Five, Six Math is Kicks When You Seven, Eight Calculate! Instructor 91: 130-133; September 1981.

A step-by-step guide to help teach elementary children how to use a calculator is presented.

(Activities, Elementary)

Block, G. H. Dyscalculia and the Mini-calculator - The ALP Program. Academic Therapy 16: 175-181; November 1980.

Successful calculator experiences in the clinical APL program for elementary disabled learners are described along with a method for dealing with fractions, in which decimal answers are converted to equivalent fractions.

(Curriculum, Decimals, Elementary, Fractions, Learning disabilities, Recommendations, Remedial)

Blume, Glendon W. The Rationality of a^b -- An Application to Calculators. MATYC Journal 15: 55-59; Winter 1981.

Using the y^x (or 10^x) key on a calculator for determining the rationality of a^b is investigated. Comments on rational approximations displayed for an irrational number are also included.

(Calculator keys, Exponents, Integers, Powers, Rational numbers, Secondary)

Boltanskii, V. G. School and Pocket Calculator. Matematika v Shkole 2: 46-49; 1979.

(Activities, Elementary, Secondary)

Bone, Dorothea. Making Calculators Count. Independent School 40: 45-47; May 1981.

A brief history of the development and use of the hand-held calculator is presented. Recommendations for general classroom use are made.

(Recommendations)

Brey, Rita Kolmesh. Effects of Problem Solving Activities and Calculators on Problem Solving and Computation in Grade Four. (The University of Michigan, 1980.) Dissertation Abstracts International 41A: 1914; November 1980.

Studied were the effects of a planned sequence of problem-solving activities and use of calculators on problem-solving and computational performance. Calculator use did not decrease computational skills. The calculator was useful if the problems were within the scope of the child's paper-and-pencil ability. Those who had used calculators were less afraid than others to attempt difficult problems.

(Achievement, Anxiety, Attitudes, Elementary (grade 4), Four-function calculators, Problem solving, Research)

Brogdon, B. Easy Course and Distance by Calculator. Motor Boat and Sailing 147: 108-109; March 1981.

(Navigation)

Brown, Stephen I. and Rising, Gerald R. The Development of New Curriculum for the New Calculation. Computing Teacher 8: 52-55; No. 2, 1980-81.

Discussed are ways the calculator can be used as a tool to explore new curriculum directions such as the nature of thought.

(Algorithms, Curriculum, Calculator logic, Calculator memory, Logarithms, Recommendations, Roles)

Buchanan, Samual Paul. Mathematical Problem-Solving With and Without a Calculator and Its Effect on Alpha Activity. (The University of Texas at Austin, 1980.) Dissertation Abstracts International 41A: 2981; January 1981.

Students in grades 11 and 12 performed mental arithmetic, problem solving without a calculator, and problem solving with a calculator, followed by rest, during which their brain activity was measured. The amounts of alpha activity between problem solving with and without a calculator were not significantly different.

(Problem solving, Research, Scientific calculators, Secondary (grades 11, 12)

Burkhardt, Hugh. Seven Sevens Are Fifty? Mathematics for the Real World. Nottingham, England: Shell Centre for Mathematical Education, University of Nottingham, 1977.

(Consumer applications)

Butts, Thomas. Fixed Point Iteration - An Interesting Way to Begin a Calculus Course. Two-Year College Mathematics Journal 12: 2-7; January 1981.

Suggestions for calculator use are mentioned within a sample lesson teaching fixed point iteration.

(Calculus, College, Iteration, Scientific calculators)

Campbell, Stafford. The Yachtsman's Guide to Calculator Navigation. New York: Ziff-Davis, 1980.

Suggestions for using the calculator as a navigational tool are given.

(Naval applications, Scientific calculators)

Carmony, Lowell. Analysis of a Truck Driver's Square Root Algorithm. Mathematics Teacher 74: 144-149; February 1981.

An algorithm for approximating square roots is analyzed. One small section deals with using a calculator to generate a table.

(Algebra, Algorithms, Calculus Roots, Secondary)

Carpenter, Thomas P.; Corbitt, Mary Kay; Kepner, Henry S., Jr.; Lindquist, Mary Montgomery; and Reys, Robert E. Calculators and Computers. In Results from the Second Mathematics Assessment of the National Assessment of Educational Progress. Reston, Virginia: National Council of Teachers of Mathematics, 1981. Pp. 115-132.

This chapter presents NAEP data on how students performed on different types of exercises and problems when they used calculators.

(Achievement, Attitudes, Elementary (age 9), Four-function calculators, Junior high (age 13), Mixed operations, Problem solving, Related (computers), Research, Secondary (age 17)

Carpenter, Thomas P.; Corbitt, Mary Kay; Kepner, Henry S., Jr.; Montgomery, Mary Lindquist; and Reys, Robert E. Calculators in Testing Situations: Results and Implications from National Assessment. Arithmetic Teacher 23: 34-37; January 1981.

The 1977-78 NAEP mathematics assessment provided information about performance on routine computation and problem solving when calculators were available. The data indicated that calculators are widely accessible to students at ages 9, 13, and 17. They performed routine computation better with the use of a calculator.

(Achievement, Elementary (age 9), Four-function calculators, Junior high (age 13), Mixed operations, Problem solving, Research)

Carter, L. R. and Huzan, E. Teach Yourself the Pocket Calculator. New York: David McKay, 1979.

Applications of the scientific calculator in science and business, featuring popular equation and calculator techniques, is presented.

(Business, Post-secondary, Science, Scientific calculators)

Casterlow, Gilbert, Jr. The Effects of Calculator Instruction on the Knowledge, Skills, and Attitudes of Prospective Elementary Mathematics Teachers. (The Pennsylvania State University, 1980.) Dissertation Abstracts International 41A: 4319; March 1981.

Pre-service elementary teachers (n = 94) were randomly assigned to one of three types of instruction: (1) teacher-guided instruction and practice with the calculator as a computational and instructional tool, (2) independent instruction whereby a calculator was provided along with reading materials related to the use of the calculator for computation and instruction, and (3) reading materials related to the calculator and its use in the elementary school. Group 1 did significantly better on the Calculator Computation Test (CCT) than group 2, and group 2 did significantly better on the CCT than group 3.

(Achievement, Attitudes, Elementary, Research, Scientific calculators, Teachers (preservice))

Chang, Ping-Tung. Re-evaluating the Secondary Mathematics Curriculum for the 80's. August 1980. ERIC: ED 199 095.

Deletion of certain traditional topics and the addition of new ones in the mathematics curriculum are suggested because of technology.

(Curriculum, Related (technology), Secondary)

Channell, Dwayne E. Using Calculators to Fill Your Table. Mathematics Teacher 74: 199-202; March 1981.

This activity requires students to construct tables of values for use in solving maximization problems involving area. Three worksheets are provided.

(Activities, Elementary, Geometry, Junior high, Measurement, Worksheets)

Chapin, J. F. Calculator Program for Normal and Log-Normal Distributions. Chemical Engineering 87: 75; 1980.

(College, Statistics)

Cheung, Y. L. Equation - Solving with the Calculator. Australian Mathematics Teacher 37: 4; April 1981.

The trial-and-error method using the calculator is explored as a useful equation-solving strategy.

(Secondary, Solution methods)

Chirpich, Thomas P. Analysis of Student Laboratory Data - An Illustration of the Usefulness of an Inexpensive Programmable Pocket Calculator. Journal of Chemical Education 58: 436-437; May 1981.

An inexpensive programmable calculator is used to perform and to check calculations in an experimental situation on freezing point depression data.

(Chemistry, Programmable calculators)

Clarke, Frank H. Calculator Programming for Chemistry and the Life Sciences. New York: Academic Press, 1982.

(Biology, Chemistry, Programmable calculators)

Clayton, John. Incorporating Calculators into the Accounting Curriculum: Accounting I and II. 1978. ERIC: ED 205 690, ED 205 691.

Uses of calculators in the business curriculum are presented.

(Business, Curriculum)

Conner, Totsye J. An Investigation of the Use of Hand-Held Calculators in Grades K-5 at P. K. Yonge Laboratory School. National Association of Laboratory Schools Journal 15-18; November 1979.

Two classes each of kindergarten, second-, and fourth-grade students (n = 161) were designated experimental groups. First-, third-, and fifth-grade students (n = 164), who were tested the previous year using the Metropolitan Achievement Test Form F (MAT), served as the control group. The six teachers of the experimental groups participated in a workshop on calculator use and materials. During the school year, these teachers made decisions about specific activities and how frequently calculators were used. The ratio of calculators to students in the experimental classes was one to two. No significant differences in achievement between the experimental and control groups were found at the second- and fourth-grade levels. However, the kindergarten group using calculators scored significantly higher on the MAT than the group not using calculators.

(Achievement, Classroom management, Elementary, (k, 2, 4), Four-function calculators, Problem solving, Research)

Connor, Philip Joseph. A Calculator Dependent Trigonometry Program and Its Effect on Achievement in and Attitude Toward Mathematics of Eleventh and Twelfth Grade College Bound Students. (Temple University, 1981.) Dissertation Abstracts International 42A: 2545-2546; December 1981.

A trigonometry course was developed which was dependent on the use of a calculator. A comparison of two calculator and two non-calculator trigonometry classes indicated no significant difference in mathematical achievement, no significant change in attitude toward mathematics, and significant achievement on supplementary topics by the calculator group.

(Curriculum, Research, Secondary (grades 11, 12), Trigonometry)

Cramery, Leo. Selecting Calculators for Primary Schools. Australian Mathematics Teacher 35: 32-33; November 1979.

Calculator features are categorized as essential, useful, or unnecessary for primary school use.

(Elementary, Selection)

Crousen, Willa Vee (Ed.). A Guide for Vocational Teachers of Intensive Business Training in Mississippi, 1980. ERIC: ED 201 887.

A unit on calculating machines is included.

(Business, Secondary, Units)

Davies, Brian. Using Calculators with Juniors. Mathematics Teaching 93: 12-15; December 1980.

An investigational approach to mathematics is described along with the benefits of using a calculator in this type of instruction.

(Activities, Elementary, Problem solving)

Dean, David Keller. The Effectiveness of Using a Hand-Held Calculator as an Instructional Aid in Teaching the Basic Multiplication Facts to Fourth Graders. (Michigan State University, 1980.) Dissertation Abstracts International 41A: 3929; March 1981.

Fourth-grade students from seven classrooms were assigned to three achievement levels. Each class was randomly assigned to use calculators either for all computation or only for checking problems, or was denied use of calculators. No significant differences between groups were found, but teachers reported that the calculator was motivating for students.

(Achievement, Attitudes, Elementary (grade 4), Four-function calculators, Multiplication, Research)

Decraene, B. and Plancke-Schuyten, G. 1. Calculators in Elementary-Schools. 2. A Calculator Exploratory-Study with Fourth Graders. Scientia Paedagogia Experimentalis 18: 21-33; 1981.

(Elementary, Research)

Dolan, Daniel T. Some Irrational Results with Irrational Numbers. Mathematics Teacher 74: 258-261; April 1981.

Calculators and computers are used to test the equivalence of algebraic expressions using various approximations of irrational numbers.

(Algebra, Secondary)

Duea, Joan and Ockenga, Earl. Classroom Problem Solving with Calculators. Arithmetic Teacher 29: 50-51; February 1982.

Students are encouraged to write their own problems to be solved with a calculator.

(Elementary, Junior high, Problem solving)

Dye, David L. The Use and Non-Use of Calculators on Assessment Testing. St. Paul, Minnesota: State Department of Education, Mathematics Education, 1982. ERIC: SE 036 033.

Eighth-grade students were given one form of a mathematics assessment instrument. Control students did not have access to calculators. One experimental group was issued calculators for the test and the other was allowed to bring and use calculators if desired. Only 8 of the 42 test items were a type where a calculator could be used to advantage. The use or nonuse of a calculator did not make any difference in the final result.

(Achievement, Junior high (grade 8), Research)

Edens, Helen S. Calculators in the First Grade: How Should They be Used? Virginia Mathematics Teacher 7: 11-14; February 1981.

See Edens, 1981.

(Achievement, Attitudes, Elementary (grade 1), Four-function calculators, Research, Teachers (in-service))

Edens, Helen Smith. Effects of the Use of Calculators on Mathematics Achievement of First Grade Students. Unpublished doctoral dissertation, University of Virginia, 1981.

In grade 1, four calculator classes and two non-calculator classes were randomly identified. Teachers in one calculator group were given in-service education on using calculators. All groups used the same worksheets for 30 minutes each day during the 6-week study. The non-calculator group scored significantly higher on the posttest of mathematics objectives and on mathematical concepts than did the calculator group. Students whose teachers had the in-service work scored significantly higher on concepts. Teacher attitudes were more positive toward the use of calculators after the experimental period.

(Achievement, Attitudes, Elementary (grade 1), Four-function calculators, Research, Teachers (in-service))

Elich, Joseph and Elich, Carletta. College Algebra with Calculator Applications. Reading, Massachusetts: Addison-Wesley, 1982.

New features of this text include the use of calculators integrated into computational problems to reinforce concepts.

(Algebra, College)

Elich, Joseph and Elich, Carletta. Precalculus with Calculator Applications. Reading, Massachusetts: Addison-Wesley, 1982.

The use of calculators is integrated into computational problems.

(Algebra, Secondary (grades 11, 12), Trigonometry)

Elliott, James William. The Effect of Using Hand-Held Calculators on Verbal Problem Solving Ability of Sixth-Grade Students. (University of Oregon, 1980.) Dissertation Abstracts International 41A: 3464; February 1981.

One group used the calculator for practice, while the other used paper and pencil. No significant difference was found between groups on a verbal problem-solving test. However, both groups had higher scores on the calculator version of the test.

(Achievement, Elementary (grade 6), Four-function calculators, Problem solving, Research)

Etlinger, Leonard and Ogletree, Earl J. Calculators and Microcomputers for Exceptional Children. Chicago, Illinois: Chicago State University, May 1981. ERIC: ED 202 707.

Some ways to use calculators with handicapped and learning disabled children are suggested.

(Activities, Elementary, Handicapped (blind/retarded), Learning disabilities, Related (computers), Selection)

Evans, John. A Calculator Policy. Australian Mathematics Teacher 36: 32-33; July 1980.

A suggested policy for the use of calculators in schools is presented with a general set of guidelines.

(Recommendations)

Fabrey, Lawrence J. and Roberts, Dennis M. Effects of Calculator Usage and Task Difficulty on State Anxiety in Solving Statistical Problems. April 1981. ERIC: ED 202 705.

Undergraduates (n = 128) were randomly assigned to one of four conditions formed by crossing two levels of task difficulty (computationally easy or difficult problems) with two modes of calculation (solving by hand or calculator). When solving problems by hand, there was a larger increase in state anxiety between easy and difficult problems. However, level of anxiety on easy problems solved by hand was not lower than for difficult problems solved with a calculator.

(Anxiety, College, Four-function calculators, Research, Statistics)

Fearnley-Sander, Desmond. The Programmable Calculator: A Computer for Every Pocket. Australian Mathematics Teacher 35: 8-12; November 1979.

Two detailed examples are given using programmable calculators to compute summations and averages. Other uses are suggested. Features of the Hewlett Packard 33E are reviewed.

(Activities, Programmable calculators, Statistics)

Fennell, Francis (Skip); Houser, Larry L.; McPartland, Donna; and Parker, Sandra. Ideas. Arithmetic Teacher 29: 31-36; February 1982.

Sports-oriented worksheets provide computational and problem-solving practice using fractions, decimals, and percent.

(Elementary (grades 1-6), Junior high (grades 7-8), Worksheets)

Fielker, David F. Editorial. Mathematics Teaching 94: 2-4; March 1981.

A small section discusses the impact of calculators on the mathematics curriculum and necessary reforms.

(Curriculum, Recommendations)

Flanders, Harley and Price, Justin J. Precalculus Mathematics. Philadelphia, Pennsylvania: Saunders College Publishing, 1981.

Calculators are used in a matter-of-fact way in this textbook. Instructions are provided to acquaint students with the capabilities of their calculators as the need arises. For students who have only a four-function calculator, primitive logarithm and trigonometry tables are included.

(Algebra, Curriculum, Scientific calculators, Secondary (grades 11-12), Trigonometry)

Flanders, Harley and Price, Justin J. Trigonometry. Philadelphia, Pennsylvania: Saunders College Publishing, 1982.

Trigonometry is presented without the use of log and trig tables, but rather with scientific and programmable calculators.

(Curriculum, Programmable calculators, Scientific calculators, Secondary (grades 11-12), Trigonometry)

Foster, Brian. Calculators and Primary Mathematics. Australian Mathematics Teacher 35: 13-14; November 1979.

Research on the use of the Texas Instrument Little Professor in two third-grade classes is presented. For each of the addition, subtraction, multiplication, and division scores, the achievement of the Little Professor class was significantly better than the non-calculator class.

(Elementary (grade 3), Mixed operations, Preprogrammed devices, Research)

Francevich, L. I. Calculation of Results of Biological Experiments by Programmable Pocket Calculator Elektronika B3-21. Kiev, USSR: Naukova Dumka, 1979.

(Biology, College, Programmable calculators)

Gaar, Kermit A., Jr. Teaching Modelling Concepts: Enter the Pocket-Size Programmable Calculator. Physiologist 23: 27-39; April 1980.

Using a programmable calculator (HP-97) in the modelling of physiological systems is described.

(College, Programmable calculators, Programming, Science, Selection)

Garcia, Jose Miguel Gallego. Molecular Parameters of Diatomic Molecules: A Programmable Calculator Program. Journal of Chemical Education 58: 610-611; August 1981.

(Chemistry, College, Science)

Gatford, J. D. and Pitman, C. Calculator Exercises for Year Nine. Australian Mathematics Teacher 36: 27; January 1981.

Calculator exercises in this supplementary workbook deal with four topics: basic operations, money calculations, mensuration, trigonometry, and algebra.

(Activities, Algebra, Consumer applications, Measurement, Mixed operations, Secondary (grade 9), Trigonometry)

Gatford, J. G. and Pitman, C. Calculator Exercises for Year 9. Melbourne, Australia: Longman Cheshire, 1979.

This is a textbook supplement which is intended to give ninth-grade users enough practice in basic operations so that they can use the calculator with ease and confidence in every aspect of the mathematics course. The contents are: basic operations, measurement, money calculations, trigonometry and algebra.

(Activities, Algebra, Consumer applications, Measurement, Mixed operations, Secondary (grade 9), Trigonometry)

Gatford, J. G. and Pitman, C. Calculator Exercises for Year 10. Melbourne, Australia: Longman Cheshire, 1980.

This is a textbook supplement for tenth-grade mathematics.

(Activities, Secondary (grade 10))

Gilde, V. and Altrichter, Z. With a Pocket Calculator in Hand. Moscow: Mir, 1980.

(Activities)

Goodman, Danny. Electronic Learning Aids. Creative Computing 7: 272-274; September 1981.

Electronic learning aids for children are described. They include Speak & Math, non-mathematical aids, and general electronic learning aids such as Mattel's Children's Discovery System.

(Electronic learning, Elementary, Marketing, Preprogrammed devices)

Goodman, Terry. Calculators and Estimation. Mathematics Teacher 75: 137-140, 182; February 1982.

Worksheets which provide good practice in estimating answers using multiplication and division are given.

(Division, Estimation, Junior high (grades 7-9), Multiplication, Secondary (grades 10-12), Worksheets)

Gourdouze, Robbyn. Keeping Calculators Ready. Mathematics Teacher 74: 529-531; October 1981.

Instructions for constructing a calculator bin rack are given.

(Classroom management)

Grabis, Dietrich Walter. The LCD Market: The Origin and Underlying Reasons for the Growth of Liquid Crystal Display Technology in the USA -- Focus: Electronic Watch and Calculator Applications. (Golden Gate University, 1980.) Dissertation Abstracts International 42A: 2273; November 1981.

Marketing research disproved the notion that LCD technology was short-lived. It was outperforming all other competing display technologies and was well-accepted by consumers.

(Marketing, Related (technology), Research (survey))

Green, D. R. How Probability Pays. Mathematics in School 10: 23-24; March 1981.

The theory behind three probability puzzles is discussed. Included is a table of probabilities for matching birthdays.

(Probability)

Gregory, Christopher A. Calculators in the Elementary Mathematics Curriculum: An Annotated Bibliography. Leeds, England: The University of Leeds, Centre for Studies in Science Education, 1981.

This annotated bibliography includes a selection of relevant calculator literature available in the English language. Indexes of authors and institutions and notes on availability of publications are included.

(Elementary (grades k-6), Junior high (grades 7-8), References)

Gregory, Christopher A. Electronic Calculators in the Elementary Mathematics Curriculum. Leeds, England: University of Leeds, School of Education, Centre for Studies in Science Education, January 1981.

This report summarizes a study conducted by the Centre for Studies in Science Education, University of Leeds and includes: a summary of recent developments, an historical overview, current developments, and prospects, a calculator ownership survey, a middle school calculator survey, specifications for pocket calculators with an annotated bibliography, and suggestions for future developmental work.

(Curriculum, Elementary, Recommendations, References (selected), Research, Status report)

Gretler, Armin (Ed.). Der Taschenrechner in Der Schule: Probleme, Forschusergebnisse und Didaktische Ansatze (The Calculator in the School). Aarau, Switzerland: Swiss Coordination Centre for Research in Education, October 1980.

Background information on the use of calculators in schools (including activities in the U.S.) are included in this comprehensive report, as well as specific suggestions for curriculum and instruction. Appendices include reports from the various Swiss cantons.

(Activities, Curriculum, References (selected), Status report)

Grinfeld, U. K. Calculus by the Calculator Elektronika B3-21: Instruction for Programming. Riga, USSR: Latvian State University, 1978.

(Calculus, College, Programmable calculators)

Gross, Ena. An Exploratory Study on the Use of Calculators and Problem Solving Heuristics with In-Service Elementary School Teachers. (Georgia State University - College of Education, 1980.) Dissertation Abstracts International 41A: 1451-1452; October 1980.

The teachers who had access to calculators employed the heuristic "use successive approximation" more often than students without calculators. Calculators were only beneficial for those problems in which the computation required to solve it really necessitated the use of a calculator.

(Problem solving, Research, Scientific calculators, Teachers (in-service))

Haigh, Gordon. Number Bases, Calculators and Geometric Progressions. Mathematics in School 10: 22-23; March 1981.

Using the calculator to find starting points for geometric progressions is suggested.

(Calculus, College, Nondecimal bases, Pattern searches, Scientific calculators)

Hamilton, Ben. Calculator Fun and Games. London, England: Fontana Paperbacks (Collins), 1981.

(Games)

Hannah, Max and Henry, Bruce. Teaching Long Division of Decimals Using a Calculator! Australian Mathematics Teacher 37: 2-3; April 1981.

The use of the calculator as a teaching aid, not just a computational aid, is described. The development and actual use of a unit on the division of decimals by decimals is described.

(Decimals, Elementary, Junior high, Pattern searches, Research, Units)

Harcharik, K. Teaching the Correct Use of the Electronic Calculator. Journal of Business Education 56: 187-190; February 1981.

Proper use of calculators in business education is discussed.

(Business, Scientific calculators, Secondary, Teachers (in-service))

Hart, K. Mathematics - Science Links in the Secondary School. Mathematics in the School 10: 12,14; May 1981.

This first in a series of four articles explores the links that already exist between Departments of Mathematics and Science. The needs for more consultation and joint action are emphasized.

(Research (survey), Secondary)

Hartman, Janet. Approximating Logarithms Intuitively. Mathematics Teacher 74: 276-277; April 1981.

A process for developing the approximate values of the logarithms for the numbers two through nine is presented. These values are then compared with the calculator-generated logarithms.

(Activities, Logarithms, Scientific calculators)

Haviland, R. P. The COMPULATOR Book: Building Super Calculators and Mini Computer Hardware with Calculator Chips. Blue Ridge Summit, Pennsylvania: Tab Books, 1977.

This book explains how to build calculators and minicomputer hardware using calculator chips.

(Building, Related (computers))

Hayes, Robert L. Calculators and Curriculum Change. Australian Mathematics Teacher 36: 21; March 1980.

Reasons for revising and updating mathematics teaching procedures and curriculum to incorporate the use of calculators are presented.

(Curriculum, Roles)

Hector, Judith H. and Frandsen, Henry. Calculator Algorithms for Fractions with Community College Students. Journal for Research in Mathematics Education 12: 349-355; November 1981.

Community college students were randomly assigned to groups using one of three methods for teaching fraction computation. The first method was the use of the conventional algorithm. The second method was a combination of the algorithms and calculators for whole number calculation. In the third method each fraction was converted to a decimal on a calculator before any operations were performed. Although there were significant pretest to posttest gains in all three groups, the calculator group did not show significant gains compared to the other two. However, significant differences between the pre- and posttest scores were found.

(Achievement, Algorithms, Attitudes, College, Fractions, Research)

Henrici, Peter. Essentials of Numerical Analysis with Pocket Calculator Demonstrations. New York: Wiley, 1982.

(College, Numerical analysis)

Hersberger, James and Wheatley, Grayson. A Proposed Model for a Gifted Elementary School Mathematics Program. Gifted Child Quarterly 24: 37-40; Winter 1980.

One section of this article considers the role of the calculator in elementary mathematics classrooms for the gifted, with respect to problem solving, estimation, and concepts.

(Curriculum, Elementary, Estimation, Gifted, Problem solving, Related (computers), Roles)

Hestenes, Marshall and Hill, Richard. Algebra and Trigonometry with Calculators. Englewood Cliffs, New Jersey: Prentice-Hall, 1981.

This book incorporates calculators in the algebra and trigonometry course.

(Algebra, College, Scientific calculators, Trigonometry)

Hestenes, Marshall D. and Hill, Richard O. On Integrating Calculators into College Algebra and Trigonometry. East Lansing, Michigan: Michigan State University Department of Mathematics, 1981.

The results of a comparative study which integrated calculator use into a college algebra and trigonometry course are given.

(Achievement, Algebra, Attitudes, College, Functions, Logarithms, Problem solving, Research, Scientific calculators, Trigonometry)

Hestenes, Marshall and Hill, Richard. College Algebra with Calculators. Engelwood Cliffs, New Jersey: Prentice-Hall, 1982.

(Algebra, College)

Hill, L. Extending Your Calculator. Australian Mathematics Teacher 35: 31-32; November 1979.

Methods are presented for finding square roots, cube roots, and powers on calculators that do not have these keys. How to generate random numbers and truncate a number are also explained.

(Calculator keys, Four-function calculators)

Hirst, Keith. Numbers, Significance and Calculators. Mathematics in School 9: 12-13; November 1980.

Some issues regarding significant figures are discussed.

(Junior high, Secondary, Significant figures)

Hohenstein, C. Louis. Using Programmable Calculators for Business. New York: Wiley, 1981.

(Business, Programmable calculators)

Holdsworth, D. K. Pocket Calculators in Chemical Education. Education in Chemistry 17: 178-179; November 1980.

Uses of programmable calculators include chemical simulations, testing hypotheses, repetitive calculation, monitoring experiments and games.

(Activities, Chemistry, College, Games, Programmable calculators, Secondary, Selection)

Hollombe, Libby and Lubin, Lee. Calculator Blast-Off: Problem Solving in Basic Skills. Oak Lawn, Illinois: Ideal School Supply Company, 1979.

This calculator activity book includes activities in basic mathematics skills, place value, problem solving, estimation, numeration, money, patterns, recording skills, following directions, writing numbers, word recognition, and completing sentences.

(Activities, Consumer applications, Elementary, Estimation, Four-function calculators, Mixed operations, Place value, Problem solving, Worksheets)

Hollombe, Libby and Lubin, Lee. Calculator Blast-Off, II: Problem Solving in the Basic Skills. Oak Lawn, Illinois: Ideal School Supply Company, 1980.

This calculator activity book includes concepts similar to Calculator Blast-Off, but contains more difficult computations.

(Activities, Elementary, Four-function calculators, Problem solving, Worksheets)

Huff, Darrell. Calcu-Letter. Popular Science 218: 60; January 1981. 218: 68; March 1981. 218: 28; May 1981. 218: 42; July 1981. 218: 6; September 1981. 218: 24; November 1981.

This bi-monthly column presents problems and suggestions about calculator use.

(Activities)

Huff, R. B. and Carter, K. N. Calculators and Standard Deviation. Journal of Chemical Education 58: 49-50; January 1981.

Methods used by eight brands of calculators in computing standard deviation are discussed.

(Calculator logic, Programmable calculators, Scientific calculators, Selection, Statistics)

Hyatt, Herman R. A Curriculum Note on a Hand-Held Calculator Course. Mathematics and Computer Education 16: 56-57; Winter 1982.

A course which provides instruction in the use of a hand-held calculator is described.

(College, Course description)

Inglis, Norman J. The Case for Programmable Calculators in Schools. Australian Mathematics Teacher 36: 24-26; January 1981.

The advantages to using programmable calculators in high school instead of computers are discussed.

(Activities, Programmable calculators, Pros/cons, Related (computers), Roles, Secondary)

Johnson, David C. Calculator Exploration for Concept Reinforcement. Mathematics Teaching 95: 28-29; June 1981.

Two calculator activities are presented which reinforce concepts and relationships introduced previously. The advantages of this approach are also discussed.

(Activities, Elementary, Estimation, Four-function calculators, Junior high, Numerical analysis, Recommendations)

Jones, Chris. 72 x 49. Mathematics Teaching 94: 8-11; March 1981.

Several advantages of using calculators to explore the multiplication algorithm are described.

(Activities, Algorithms, Elementary, Multiplication)

Judd, Wallace P. A New Case for the Calculator. Learning 3: 41-48; March 1975.

The role of calculators in the elementary mathematics curriculum is discussed.

(Curriculum, Elementary, Four-function calculators, Recommendations, Roles)

Judd, Wallace P. Using Your Calculator. In Problem Solving Kit for Use with a Calculator. Chicago: Science Research Associates, 1978.

This consumable workbook familiarizes students with the features and use of a minicalculator. It shows how the calculator can be used to perform a variety of calculations that are part of a basal mathematics program, and is helpful for anyone who has little or no experience working with a calculator.

(Elementary (grade 6), Junior high (grades 7-9), Problem solving, Worksheets)

Kaner, Peter. Tables Are Dead! Long Live Tables! Mathematics in School 10: 25-26; September 1981.

The new form of mathematical tables being published is explained. The advantages of such tables over calculators are discussed.

(Pros/cons)

Kissane, Barry. Programmable Calculators. Australian Mathematics Teacher 36: 26; July 1980.

Several advantages of programmable calculators over computers are presented. They include cost, portability, and effectiveness.

(Programmable calculators)

Klein, D. Shop with a Pocket Calculator. 50 Plus 21: 50; July 1981.

(Consumer applications)

Kleupfel, Charles. When Are Logarithms Used? Mathematics Teacher 74: 250-253; April 1981.

Seven excellent problems requiring the use of logarithms are presented. They included banking, scientific, and game problems.

(Logarithms, Problem solving, Scientific calculators)

Knowles, Frank. Books for Calculators. Mathematics Teaching 95: 54-57; June 1981.

Seven calculator textbooks and two calculator puzzle books are reviewed.

(Junior high, Post-secondary, Recommendations, References (selected), Secondary)

Koop, Anthony J. Calculators in Schools: Some Curriculum Considerations. Australian Mathematics Teacher 35: 6-7; November 1979.

Several general uses of calculators in the classroom are discussed. They include use as a functional tool and as a pedagogical tool. A warning against the use of a calculator for the sake of using it is issued. References on some effects, uses, and selections of calculators are cited.

(Curriculum, Roles)

Koop, Janice B. Calculator Use in the Community College Arithmetic Course. Journal for Research in Mathematics Education 13: 50-60; January 1982.

One hundred fifty students enrolled in a community college arithmetic course were randomly assigned to two treatment groups. Three classes were given traditional instruction; three were instructed in the use of calculators and were allowed to use them for all classroom, homework, and testing activities. On the total posttest and on most of the subtests the differences between the treatment groups were not significant.

(College, Remedial, Research)

Kovalev, M. and Shvarcburd S. Electronics Will Come to School. Literaturnaya Gazeta 48: 11; 1976.

(Activities, Elementary, Secondary)

Kovalev, M. P. and Shvarcburd, S. I. Electronics Help to Calculate: Methodical Aid for Teachers. Moscow: Proveshenie, 1978.

(Activities, Elementary, Secondary, Teachers)

Kovalev, M. P. and Shvarcburd, S. I. Modern Methods in Teaching Arithmetics. Mathematika v Shkole 2: 43-46; 1979.

(Activities, Elementary)

Krist, Betty Jane. The Programmable Calculator in Senior High School: A Didactical Analysis. (State University of New York at Buffalo, 1980.) Dissertation Abstracts International 41A: 2982; January 1981.

A mathematics class studied materials designed for use with a programmable calculator in grades 11 and 12. The calculator bridged the gap between formal proof and understanding a basic theorem, made discovery a viable instructional strategy, and served as a pedagogical language for student-teacher interaction.

(Course description, Programmable calculators, Research, Secondary)

Lange, Brian. Calculator Approximations. Australian Mathematics Teacher 36. 33-34; July 1980.

A method for using the binomial theorem to approximate multiplication is presented.

(Algebra)

Levin, Eugene M. Binomial Baseball. Two-Year College Mathematics Journal 12: 260-266; September 1981.

A program to play a simulated baseball game is presented. The statistics from the game agree well with the expected values computed from the negative binomial distribution.

(Games, Programmable calculators, Statistics)

Levin, James A. Estimation Techniques for Arithmetic: Everyday Math and Mathematics Instruction. Educational Studies in Mathematics 12: 421-434; November 1981.

Estimation techniques are discussed and a series of mental estimation procedures are presented. The procedures are based on the concepts of measurement and real numbers rather than on counting and integers. Techniques for teaching these procedures are described.

(Estimation, Mixed operations)

Lewis, Janice and Hoover, H. D. The Effect on Pupil Performance of Using Hand-held Calculators on Standardized Mathematics Achievement Tests. April 1981. ERIC: ED 204 152.

Students in grades 4 and 8 (n = 539) received brief instruction on using a calculator. Half of the students at each grade level completed mathematics subtests of the Iowa Test of Basic Skills using a calculator as an option. The same tests were given a second time without calculators. The opposite procedure was used for the other half of the students. Rates of completion at both grade levels were much lower on problem-solving and computation subtests when a calculator was available. However, computation scores increased significantly at both grade levels when calculators were used.

(Achievement, Elementary (grade 4), Four-function calculators, Junior high (grade 8), Problem solving, Research)

Lichtenberg, Betty K. Calculators for Kids Who Can't Calculate. School Science and Mathematics 81: 97-102; February 1981.

A collection of calculator activities for lower-ability mathematics students is presented.

(General mathematics, Junior high, Low achievers, Secondary, Teachers)

Lukacs, Otto. "New Math" in Technical Universities and Colleges. International Journal of Mathematical Education in Science and Technology 11: 331-345; July-September 1980.

Possibilities for teaching traditional material such as analysis using calculator subroutines are illustrated.

(Calculus, College, Technical mathematics, Trigonometry)

Lund, Charles H. 26 Spirit Masters on Calculators in Geometry and Measurement. Portland, Maine: J. Weston Walch, 1981.

This set of 26 supplemental calculator activities is for use with students of varying abilities in grades 5-12.

(Activities, Elementary, General mathematics, Geometry, Junior high, Measurement, Secondary)

Magelis. Microcalculators. Riga, USSR: Avots, 1980.

(Selection)

Maletsky, Evan M. and Hirsch, Christian (Eds.). Activities from the Mathematics Teacher. Reston, Virginia: National Council of Teachers of Mathematics, 1981.

A collection of activities which include a teachers' guide and worksheets. Some of them make use of calculators.

(Activities, Worksheets)

Marcellino, Sal. Incorporating Calculators into the Recordkeeping Curriculum: Recordkeeping I and II. 1978. ERIC: ED 205 688, ED 205 689.

Uses of calculators in the business curriculum are presented.

(Business, Curriculum)

Martin, Ann Ackerman. The Effect of the Use of the Calculator on Mathematics Anxiety in College Algebra Students. (The University of Oklahoma, 1980.) Dissertation Abstracts International 41A: 2485-2486; December 1980.

No significant differences were found in mathematics anxiety between students using or not using a calculator, or between male and female students using calculators.

(Algebra, Anxiety, College, Research, Scientific calculators)

Martin, Randy L.; Lowry, David P.; Nicholls, Albert W.; Schumacher, Joyce E.; Egan, Gerald V.; and Burton, Robert O., Jr. Use of Programmable Calculators for Depreciation Calculations. Circular 119. West Virginia: West Virginia University Agricultural and Forestry Experiment Station, 1981.

(Finance, Programmable calculators)

Martino, J. P. A Revolution in Your Hand - Past is Only Prologue for the Hand-Held Calculator. Futurist 14: 59; 1980.

The impact of calculators in the past and in the future is discussed.

(Future (technology), Roles, Status report)

Mayer, Richard E. and Bayman, Piraye. Analysis of Students' Intuitions About the Operation of Electronic Calculators. April 1981. ERIC: ED 201 503.

Thirty-three college students who were novice users of calculators were compared to 33 computer science majors who were expert calculator users. For each of 88 items (e.g., 2 + 3 +), students were asked to write down the number that would be in the calculator display after the last key was pressed. Experts were found to be more consistent than novices. Students differed greatly on when they thought an expression would be evaluated, the order in which a chain of calculations was evaluated, and whether the display would be incremented.

(Algorithms, Calculator logic, College, Research, Solution methods)

McCrae, Barry. Calculators and Numeracy. Australian Mathematics Teacher 35: 24-25; November 1979.

Support is given for the calculator as a key to the development of numeracy rather than a threat.

(Four-function calculators, Pros/cons)

McDonald, Dorothy Donella Irvine. Curriculum Units for Hand Held Calculators in General Ninth Grade Mathematics Classes. (The University of Utah, 1980.) Dissertation Abstracts International 41B: 1794; November 1980.

Calculator units were developed for use with any standard ninth-grade general mathematics text. Students were encouraged to memorize the calculator keyboard and use it without looking.

(Calculator keys, General mathematics, Research, Secondary (grade 9) Units)

McNicol, Shirley and LeMaistre, Cathrine. Problem Solving with Calculators in Elementary School Mathematics. Report to the Protestant School Board of Greater Montreal. Quebec, Canada: McGill University, Faculty of Education, 1981.

Students in grades three and five were assigned to calculator or non-calculator groups for a unit on problem solving. At the grade three level, the calculator facilitated the development of five of the seven basic skills identified in this study. At the grade five level, the results of the two groups were fairly evenly matched. The calculator had no effect on the attitude towards mathematics of the fifth grade class.

(Achievement, Attitudes, Elementary (grades 3, 5), Four-function calculators, Research)

Meck, H. R. Scientific Analysis for Programmable Calculators. Englewood Cliffs, New Jersey: Prentice-Hall, 1981.

Programmable calculators are used for scientific analysis.

(Programmable calculators, Science)

Merchant, Ronald. Basic Business Math and Electronic Calculators. San Francisco: Star Publishing, 1980.

Calculators are used in this book as an aid to learning basic business mathematics.

(Business mathematics, College, Scientific calculators, Secondary)

Merchant, Ronald. Business Math Without Tears. VOCED 55: 52-54; October 1980.

A community college course reviewing business math and calculator skills is described.

(Business mathematics, College, Course description)

Miller, Goeffery. Working Backwards to Achieve Understanding. Arithmetic Teacher 29: 48; September 1981.

Fifth- and sixth-graders worked through calculations on their calculators until they arrived at a word answer. They then learned to design their own problems.

(Activities, Elementary (grades 5-6), Four-function calculators)

Miller, William A. Calculator Tic-Tac-Toe: A Game of Estimation. Mathematics Teacher 74: 713-716; December 1981.

Three activity sheets requiring estimation of products, quotients, and powers in various tic-tac-toe configurations are given.

(Junior high, Secondary, Worksheets)

Minaeva, S. S. and Oksman, V. M. The Use of Pocket Calculator Elektronika B3-18 in Teaching Algebra and Analyses. Methodical Recommendations. Moscow: Institute of Scientific Information, 1980.

(Algebra, College, Numerical analysis, Secondary)

Moiseeva, Z. Is It Advisable for Pupils to Use Pocket Calculators at School? Kvant 5: 52; 1979.

(Elementary, Pros/cons)

Morgan, A. S.; Drake, J. B.; Heck, S. K.; and Long, C. H. Experimental Study of Effects on Speed and Accuracy of Teaching Alternate - Hand Method on a 10-Key Electronic Calculator. Perceptual and Motor Skills 52: 695-700; June 1981.

A study of forty right-handed high school and college students who were trained to operate calculators with their left hands while recording information with their right hands is described. Results suggest the possiblity of improving speed without a significant loss of accuracy.

(College, Research, Secondary)

Morris, Janet. How to Develop Problem Solving Using a Calculator. Reston, Virginia: National Council of Teachers of Mathematics, 1981.

This collection of activities illustrates ways to develop problem solving techniques using a calculator. Techniques used include: 1) look for a pattern, 2) make a chart or organized list, and 3) guess and check.

(Activities, Four-function calculators, Problem solving)

Moschytz, G. S. Active Filter Design Handbook for Use with Programmable Pocket Calculators and Minicomputers. New York: Wiley, 1981.

Programmable calculators are used as an aid to active filter design.

(Programmable calculators, Related (computers))

Moursund, David G. Calculators in the Classroom: With Applications for the Elementary and Middle School Teacher. New York: Wiley, 1981.

Activities with an emphasis on problem solving are included.

(Activities, Elementary, Junior high, Problem solving, Teachers)

Moursund, David and East, Phillip. Calculators and Computers in the Classroom: Selected Summaries of Current Education Topics. Know-Pak No. 17. Salem: Oregon State Department of Education, October 1979. ERIC: ED 191 710.

The availability and usage of calculators, computers, and related instructional materials are presented.

(Elementary, Junior high, Related (computers), Roles, Secondary, Status report)

Mulhearn, P. Setting Out with a Hand Calculator. Australian Mathematics Teacher 36: 30; July 1980.

Suggestions are made for displaying the set-up of a problem which is to be solved with the use of a calculator.

(Problem solving, Secondary)

Mullish, Henry and Kochan, Stephen. Programmable Pocket Calculators. Rochelle Park, New Jersey: Hayden, 1980.

Programmable calculators are discussed.

(Programmable calculators)

Murphy, Nancy Kathleen. The Effects of a Calculator Treatment on Achievement and Attitude Toward Problem Solving in Seventh Grade Mathematics. (University of Denver, 1981.) Dissertation Abstracts International 42A: 2008-2009; November 1981.

One hundred sixty-two students were divided into calculator and non-calculator groups for six weeks of problem solving study. At the end of the experiment both the experimental and the control groups were divided into calculator on posttest and pencil-paper posttest groups. The students who were provided with unrestricted use of calculators achieved higher in problem solving posttest scores and also in several of the specific components of problem solving skills. The treatment effect did not significantly affect the attitude of the students.

(Attitudes, Junior high (grade 7), Problem solving, Research)

Murray, Ann. Teaching Functions with a Calculator. Australian Mathematics Teacher 35: 33-34; November 1979.

Calculators are used to explore functions by drawing graphs of the ordered pairs that are produced. Excellent sample worksheets and sample test questions are given.

(Functions, Secondary, Scientific calculators, Worksheets)

Olson, Melfried. It's a Factor of Life. Mathematics Teacher 73: 681-684; December 1980.

Three calculator worksheets deal with factoring positive integers and prime numbers.

(Integers, Junior high, Pattern searches, Prime numbers, Worksheets)

O'Neil, David R. and Jensen, Rosalie. Let's Do It: Let's Use Calculators. Arithmetic Teacher 29: 6-9; February 1982.

Nine calculator activities for elementary school mathematics are presented.

(Activities, Elementary (grades 1-4), Estimation, Four-function calculators, Place value)

Pace, John P. Thematic Teaching in Remedial Mathematics. New York: National Conference on Remedial and Developmental Mathematics in College: Issues and Innovations Paper, 1981. ERIC: ED 203 935.

A thematic rather than a sequential approach to mathematics is suggested for remedial mathematics courses.

(College, Curriculum, Remedial)

Padberg, Friedhelm F. Using Calculators to Discover Simple Theorems -- An Example from Number Theory. Arithmetic Teacher 8: 21-23; April 1981.

Discussed is a method of discovering proofs, involving three steps: (1) guess first, (2) verify on a calculator, and (3) prove by exhausting all possible cases, with the help of a calculator or by algebraic methods.

(Algebra, Elementary, Numerical analysis, Proofs)

Papritan, James C. Pocket Calculators in the Agricultural Mechanics Curriculum. Chicago: American Society of Agricultural Engineers Paper, 1981.

This paper reviews the utilization of the calculator and its mathematical applications in the agricultural mechanics/mechanization curriculum. Several strategies are proposed which will assist in the alleviation of numerous mathematical concerns by both instructors and students.

(Activities, Agriculture, Pros/cons, Recommendations)

Papritan, James C. The Programmable Pocket Calculator -- A Future in Army Logistics?? 1981.

Suggestions are given for the use of a programmable calculator in Army logistics.

(Programmable calculators, Technical occupations)

Parkhurst, Scott. Hand-Held Calculators in the Classroom: A Review of the Research. Chicago, April 1981. ERIC: ED 200 416.

Recent research on the use of calculators in the classroom was reviewed.

(Elementary, Junior high, Research (review), Secondary)

Pashkova, L. and Oksman, V. Pocket Calculators in the Teaching Process. Profesionalno Technicheskoye Obrazovanie 5: 40-41; 1980.

(Activities, Elementary, Secondary)

Pask, Gordon. Calculator Saturnalia. New York: Random House, 1981.

(Activities, Games)

Peller, Richard. An Introduction to the Uses of the Programmable Calculator (TI 57). Mount Hermon, Massachusetts: Northfield Mount Hermon School, January 1981.

The following calculator programs are included: (1) table of values, (2) numerical approximation to derivative, (3) Newton's method to approximate real zeros, (4) numerical approximation for definite integral, (5) calculation of n!, (6) two approximations to the irrational number e, (7) some interesting sequences and series, and (8) the birthday problem.

(Calculus, College, Probability, Programmable calculators, Programming, Secondary)

Petrov, M. I. Technical and Economical Calculus by Pocket Calculator Elektronika B3-18. Moscow: Statistika, 1979.

(Calculus. College)

Phillips, John W. Periods with Calculators. Australian Mathematics Teacher 35: 21-22; November 1979.

The decimal representation of rational numbers is examined. A method for finding periods of length greater than eight is described.

(Rational numbers, Secondary)

Picot, A. Pocket Calculator Program for Least-Square Fitting of Data with Variable Precision. American Journal of Physics 48: 302-303; April 1980.

An example of how the calculator can be used to compute a line by the least-square-fitting method is presented along with programming with precision of points.

(College, Programmable calculators, Programming, Science)

Pikaart, Len; Butts, Thomas; Dilley, Clyde; Kullman, David; Meiring, Steve; and Suydam, Marilyn. 1980 Ohio Regional Conferences on Mathematics Education. (NSF-funded project.) Columbus: The Ohio State University, 1980. ERIC: ED 200 421.

Half of the packet of materials is devoted to activities and suggestions for using calculators in the secondary school.

(Activities, Secondary)

Plancke-Schuyten, G. and Decraene, B. Calculators in Elmentary-Schools. 1. A Survey of Elementary School Teachers. Scientia Paedagogia Experimentalis 17: 208- ; 1980.

(Elementary, Research, Teachers)

Price, Justin J. and Flanders, Harley. College Algebra. Philadelphia, Pennsylvania: Saunders College Publishing, 1982.

In this textbook the calculator is used as a support tool. Various uses are introduced as the need arises. Calculators play a minor role except in the chapter on exponentials and logarithms where their use is encouraged.

(Algebra, College, Curriculum)

Price, Justin J. and Flanders, Harley. College Algebra & Trigonometry. Philadelphia, Pennsylvania: Saunders College Publishing, 1982.

The use of calculators is encouraged in computations formerly done by logarithms and in numerical trigonometry. Calculators are not necessary, however; logarithms and trigonometry tables are provided.

(Algebra, College, Curriculum, Scientific calculators, Trigonometry)

Prigge, Glenn R.; Gawronski, Jane D.; and Vos, Kenneth E. Using the Calculator in Geometry. Portland, Maine: J. Weston Walch, 1981.

This is a set of 50 visual masters which help illustrate and explain over two dozen geometry topics.

(Geometry, Junior high (grades 7-9), Worksheets)

Rabaey, H. Principles on the Use of the Calculator in Secondary Education. Paper presented at the Conference for Mathematics Teachers, Kortrijk, Belgium, October 27, 1979.

Ten recommendations for the use of calculators in the secondary mathematics curriculum are presented.

(Recommendations, Secondary)

Rabe, Rebecca Moore. Calculators in the Mathematics Curriculum: Effects and Changes. South Bend: Indiana University, June 1981. ERIC: ED 204 178.

Twenty-six studies and other selected sources were reviewed and annotated to determine the effects of calculator use in mathematics classes and to assess proposed curriculum revisions.

(Curriculum, Recommendations, Research (review))

Råde, Lennart. Random Digits and the Programmable Calculator. In Teaching Statistics and Probability (Albert P. Shulte, Ed.). 1981 Yearbook. Reston, Virginia: National Council of Teachers of Mathematics, 1981. Pp. 118-125.

This chapter describes how the programmable calculator, which stimulates random experiments, can be used in teaching probability and statistics.

(Activities, Elementary, Junior high, Probability, Programmable calculators, Secondary, Statistics)

Rathmell, Edward C. and Leutzinger, Larry P. Classroom Activities for Able Students: In Kindergarten, First, and Second Grades. Arithmetic Teacher 28. 48, 53-54; February 1981.

Questions and calculator activities designed to challenge bright students in the primary grades are presented.

(Elementary (grades k-2), Games, Gifted, Pattern searches, Problem solving)

Rechberger, P. and Linert, W. Complete Conductance Equation of 1-1 Electrolytes and the Programmable TI 59 Calculator. Journal of Chemical Education 58: 245-246; March 1981.

The programmable TI 59 calculator is used with conductivity measurements to familiarize students with the law of mass action, the activity coefficient, and the terms of the conductivity theory.

(College, Physics, Programmable calculators)

Riggi, F. Using Simulation on Programmable Pocket Calculators in Computer-Assisted-Instruction. American Journal of Physics 49: 134-135; February 1981.

(College, Physics, Programmable calculators)

Romanovskis, T. The Effect of the Early Use of Calculators on the Acquisition of Number Concepts and Skills. Berkeley, California: IV International Conference for Psychology of Mathematics Education, 1980.

(Elementary, Research)

Romanovskis, T. and Revunov, A. D. Use of Calculators in the Solving of Astronomical Tasks. Zvaigžņotā Debess 84: 52-56; 1979.

(Astronomy, Post-secondary)

Rule, Robert Loren. The Effect of Hand Held Calculators on Learning About: Functions, Functional Notation, Graphing, Function Composition, and Inverse Functions. (Iowa State University, 1980.) Dissertation Abstracts International 41A: 3866; March 1981.

Two basic mathematics classes were randomly assigned to be experimental groups (n = 126), while one class was the control group (n = 38). In the experimental groups, the calculator was used in demonstrations and discussions to aid learning about functions. In the control group, calculator use was allowed but not required or encouraged. No significant differences in achievement were found between groups.

(Achievement, College, Functions, Research, Units)

Rynone, William John. An Investigation of the Impact of Specialized Training in the Use of the Hand-Held Calculator on Selected Engineering Technology Students. (New York University, 1980.) Dissertation Abstracts International 41A: 5014; June 1981.

One experimental and one control group from each of two schools offering electronics programs within a major department of engineering technology studies were used. The experimental groups were exposed to formalized training in the use of hand-held calculators early in their first semester, using a calculator training manual. At the completion of the training period a test was administered. The findings of the study indicated formalized training resulted in superior test performance for the experimental group.

(College, Engineering, Research)

Sauer, Gerhard. Playing the Quantum Shuffling Game with Programmable Pocket Calculators and Microcomputers. Physics Education 16: 108-111; March 1981.

The teaching of statistical physics through the use of the quantum shuffling game on programmable calculators and microcomputers is described.

(College, Physics, Programmable calculators)

Schoen, Harold. et al. The Iowa Problem-Solving Project: Development and Evaluation. August 1980. ERIC: ED 199 052.

This report discusses the development and evaluation of methods of teaching problem solving while incorporating calculators.

(Curriculum, Elementary (grades 5-6), Junior high (grades 7-8), Problem solving)

Selden, William and Jorgensen, Carl E. Forum Feature: Business Classroom and Laboratory Equipment. Business Education Forum 35: 27-46; January 1981.

Information about specific brands of calculators is presented. The types of calculators discussed are: combination display/printing, display, mini, and printing.

(Business education, Desk calculators, Four-function calculators, Marketing, Preprogrammed devices, Programmable calculators, Selection)

Sharma, Man Mohan. A Study of the Use of Hand-Held Calculators and Computer Managed Instructions in Developmental Sections of a College Algebra Course. (Ohio University, 1980.) Dissertation Abstracts International 41A: 3465-3466; February 1981.

Four treatments were compared: (1) using the computer managed instructional support system (ISS), (2) using calculators, (3) using both calculators and ISS, and (4) using neither calculators nor ISS. Students in calculator groups achieved significantly better than those in non-calculator groups, and had significant improvement in positive attitudes toward mathematics.

(Achievement, Algebra, Attitudes, College, Related (computers), Research, Scientific calculators)

Shelton, J. Calculator Mathematics. England: Collins, 1981.

(Curriculum)

Shively, John Charles. An Investigation of Effects of the Hand-Held Calculator on the Mathematics Achievement of Students at the Seventh Grade Level. (University of Southern California, 1980.) Dissertation Abstracts International 41A: 2921; January 1981.

No significant differences were found between groups using or not using calculators, with respect to mathematical applications and computational skills.

(Achievement, Four-function calculators, Junior high (grade 7), Research)

Shkil, N. I.; Slepkan, Z. I.; Savich, E. F.; Kuhar, A. V.; and Naumenko, G. G. Computing Technique Has Come to School. Matematika v Shkole 1: 35-38; 1980.

(Activities, Elementary, Secondary)

Shufeldt, H. H. and Newcomer, Kenneth. Calculator Afloat: A Mariner's Guide to the Electronic Calculator. Annapolis, Maryland: Naval Institute Press, July 1980.

Calculator use in navigation is described.

(Navigation, Post-secondary, Scientific calculators)

Shumway, Richard J. Response (to Weaver). In Mathematics Education Research: Implications for the 80's (Elizabeth Fennema, Ed.). Alexandria, Virginia: Association for Supervision and Curriculum Development, 1981. Pg. 169-171.

Shumway endorses Weaver's article and adds recommendations of his own.

(Recommendations)

Simons, F. O. and Harden, R. C. SCS Begins a New Service - Software Resources for Calculators and Personal Computers. Simulation 36: 65; 1981.

Software for calculators available through SCS is described.

(Programmable calculators, Related (computers), Selection)

Sletten, O. Algorithms for Hand Calculators to Approximate Gaussian and Chi square Probabilities. Educational and Psychological Measurement 40: 399; 1980.

Calculator algorithms that approximate Gaussian and chi square probabilities are presented.

(Algorithms, College, Probability, Statistics)

Smith, Susan M. Calculating Algebra. Mathematics Teacher 74: 119-122; February 1981.

Three calculator activity sheets are included to reinforce skills in solving linear equations, estimation, and mental computation.

(Activities, Algebra, Junior high, Secondary, Worksheets)

Snover, Stephen L. and Spikell, Mark. Brain Ticklers: Puzzles & Pastimes for Programmable Calculators & Personal Computers. Englewood Cliffs, New Jersey: Prentice-Hall, 1981.

Supplementary problem-solving activities are included.

(Activities, Games, Programmable calculators, Related (computers))

Spikell, Mark A., Ed. Programmable Calculators: Implications for the Mathematics Curriculum. Columbus, Ohio: ERIC Clearinghouse for Science, Mathematics and Environmental Education, December 1980. ERIC: ED 200 436.

This collection of papers was presented at the 1980 NCTM meeting. The articles support the use of programmable calculators and indicate specific ways in which they can be used.

(Curriculum, Problem solving, Programmable calculators, Programming, Secondary)

Steinback, Myriam. Calculator-Based Curricular Modules for Two-Year College Remedial Mathematics Courses. (Columbia University, 1980.) Dissertation Abstracts International 41A: 1454; October 1980.

A one-term calculator-based course in mathematics for junior college students needing remediation was designed. The calculator-based curricular modules helped some students in problem solving. The calculator seemed to be highly motivational, and gave students confidence to proceed in areas of mathematics they had never before explored.

(Achievement, Algebra, College, Course description, Problem solving, Remedial, Research, Scientific calculators)

Stewart, James Thomson. Using the Hand-Held Calculator as a Computing Aid for Instruction in Word-Problem Solving with Elementary Grade Students. (University of Illinois at Urbana-Champaign, 1980.) Dissertation Abstracts International 41A: 4634; May 1981.

Students in grades 4-6 (n = 146) were divided into four groups: calculator with special or standard materials and non-calculator with special or standard materials. Following daily instruction consisting of 10 problems to solve, a posttest of worded problem-solving ability was given. Students in the calculator/special materials group scored significantly lower than students in other groups. This group, however, completed the instructional materials in a significantly shorter average time than other groups.

(Achievement, Elementary (grades 4-6), Four-function calculators, Problem solving, Research, Units)

Storer, Ray. Thinking with a Calculator. Australian Mathematics Teacher 36: 29; March 1980.

Three examples are given in which a calculator cannot directly calculate an answer; it would usually indicate an error. With a little thought a student can enter the problem in a different way to obtain a correct answer.

(Activities, Algebra, Calculator keys, Secondary)

Sutliff, R. Some Ideas for a College Level Calculator Usage Course. MATYC Journal 15: 215-219; Fall 1981.

Detailed information on the organization, presentation, and content of a college level calculator usage course is provided.

(College, Course description, Scientific calculators)

Suydam, Marilyn N. Using Calculators in Pre-College Education. Computing Teacher 8: 51-54; No. 3, 1980-81.

The following topics are discussed in the Third Annual State-of-the-Art Review prepared by the Calculator Information Center: recommendations for the 1980's, evidence on availability and uses of calculators, surveys on beliefs and attitudes, and development of instructional materials.

(Status report)

Suydam, Marilyn N. Calculators: A Categorized Compilation of References. Supplement 1. December 1980. ERIC: ED 199 087.

References on calculators compiled between June 1979 and December 1980 are listed, with categories indexed.

(References)

Suydam, Marilyn N., Ed. Information Bulletins from the Calculator Information Center. Bulletins 8-11. Columbus, Ohio: Calculator Information Center, 1981. ERIC: ED 206 463.

The four Information Bulletins prepared during 1980 and 1981 present uses of calculators in secondary mathematics, activities for use at nome (grades 4-8), 67 ten-minute activities (grades 4-8), and 25 activities for teaching computation with calculators.

(Activities, Elementary (grades 1-6), Junior high (grades 7-8), Secondary)

Suydam, Marilyn N. (Ed.). Investigations with Calculators: Abstracts and Critical Analyses of Research. Supplement 2. Columbus, Ohio: Calculator Information Center, February 1981. ERIC: ED 199 086.

Fifteen research reports on calculator use are abstracted and critiqued by mathematics educators.

(References, Research (review))

Suydam, Marilyn N. (Ed.). Reference Bulletins from the Calculator Information Center. Bulletins 25-28. Columbus, Ohio: Calculator Information Center, 1981. ERIC: ED 206 442.

The four Reference Bulletins cited articles, books, dissertations, and other materials compiled by the Center during 1980 and 1981.

(References)

Suydam, Marilyn N. The Use of Calculators in Pre-College Education: Third and Fourth Annual State-of-the-Art Reviews. Columbus, Ohio: Calculator Information Center, 1981. ERIC: ED 206 454.

Status reports from August 1980 and August 1981 are included.

(Status report)

Suydam, Marilyn N. Using Calculators in Pre-College Education: Third Annual State-of-the-Art Review. delta-K 20: 15-20; June 1981.

This Third Annual State-of-the-Art Review discusses recommendations for the 1980's, evidence on availability and uses of calculators, surveys on beliefs and attitudes, and development of instructional materials.

(Status report)

Suydam, Marilyn N. (Ed.). Investigations with Calculators: Abstracts and Critical Analyses of Research. Supplement 3. Columbus, Ohio: Calculator Information Center, February 1982. ERIC: SE 036 233.

Twelve research reports on calculator use are abstracted and critiqued by mathematics educators.

(References, Research (review))

Suydam, Marilyn N. Update on Research on Problem Solving: Implications for Classroom Teaching. Arithmetic Teacher 29: 56-60; February 1982.

The effects of calculator use on problem-solving strategies and achievement in problem solving are discussed.

(Problem solving, Research)

Swartz, Cliff. True Confessions (Using Hand Calculators to Solve Problems in Physics). Physics Teacher 19: 158; March 1981.

This editorial makes the point that finding formulas in textbooks, substituting numerical values, and computing answers with a calculator can lead to learning a substantial amount of physics.

(Physics, Roles, Scientific calculators, Secondary)

Szetela, Walter. Calculator and Paper and Pencil Methods on Problem Solving Tests in Grades Five to Seven. Vancouver, Canada: University of British Columbia, April 1981.

Students in grades 5-7 (n = 116) were given calculators for use in mathematics classes. They were randomly assigned to one of two modes of completing the problem-solving posttest: using calculators or using paper and pencil. In a second section of the posttest, the groups were reversed, so that all students took a test in both modes. Three of eight comparisons of correct solutions significantly favored the calculator mode of problem solving. On measures of problems attempted and methods correct, all differences were nonsignificant except three favoring the calculator mode.

(Elementary (grades 5-6), Four-function calculators, Junior high (grade 7), Problem solving, Research)

Szetela, Walter. A Study of the Effects of Using Calculators for Problem Solving in Grades Three, Five, Seven, and Eight. Vancouver, Canada: University of British Columbia, April 1981.

Students in grades 3, 5, 7, and 8 were randomly assigned to calculator or non-calculator instruction. At each grade level one teacher taught both groups using regular materials and texts, supplemented by additional materials for the calculator groups. On tests of computational skills and problem solving on which all students used only paper and pencil, there were no significant differences. However, on a problem-solving test where calculators were used, the seventh- and eighth-grade groups using calculators scored significantly higher than paper-and-pencil groups.

(Elementary (grades 3, 5), Four-function calculators, Junior high (grades 7, 8), Problem solving, Research)

Szetela, Walter. The Effects of Using Hand Calculators in the Learning of Mathematics in Grades Three to Eight. Vancouver, Canada: University of British Columbia, April 1981. ERIC: ED 201 502.

This report contains the two previously cited studies, one on using calculators in grades 5 to 7 (1981a) and one on their use in grades 3, 5, 7, and 8 (1981b).

(Elementary (grades 3, 5, 6), Four-function calculators, Junior high (grades 7,8), Problem solving, Research)

Thompson, Ian. Types of Error and Checking Strategies in Calculator Work. Mathematics in School 10: 16-18; September 1981.

The types of error which may be made in calculator computations are discussed. Appropriate checking techniques for calculator usage are presented.

(Checking, Estimation)

Timnick, Lois. Electronic Bullies. Psychology Today 16: 10-15; February 1982.

The willingness of students to accept unreasonable answers from calculators is discussed.

(Estimation, Junior high (grades 7-9), Research, Secondary (grades 10-12)

Tokar, E. and Ruggles, D. Using Pocket Calculators to Improve the Quality of Teacher-Made Tests. Educational Technology 21: 51-52; February 1981.

A procedure is presented for determining test reliability on a calculator.

(Scientific calculators, Teachers (in-service), Testing)

Usiskin, Karen. Ideas for Calculator Activities for Junior High School. Glenview, Illinois: Scott, Foresman, October 26, 1979.

A collection of sixty-five short calculator-activities appropriate for students in grades five through nine is presented.

(Activities, Elementary (grades 5-6), Junior high (grades 7-9))

van den Brink, F. J. Zakrekenmachine (een kwalitatief onderwijsonderzoek). Nieunne Wiskrant 1: 43-48; September 1981.

Research on the use of calculators by kindergarten and elementary children is described.

(Elementary (grades k-6), Recommendations, Research)

Volk, William. Engineering Statistics with a Programmable Calculator. New York: McGraw-Hill, 1982.

(College, Engineering, Programmable calculators, Statistics)

Watson, F. R. Basic Arithmetic with a Calculator (BAC pac). Keele, England: University of Keele, 1980. Available from ERIC/SMEAC (1200 Chambers Road, Columbus, Ohio 43212).

This material was produced for use with low-achieving students aged 13 to 15. It is designed to be cut up to form 16 small "topic booklets".

(Low achievers, Secondary)

Weaver, J. Fred. Calculators. In Mathematics Education Research: Implications for the 80's (Elizabeth Fennema, Ed.). Alexandria, Virginia: Association for Supervision and Curriculum Development, 1981. Pp. 154-168.

This chapter is a somewhat subjective distellation of the essence of consequential research findings to date on calculator use in school settings, the implications of such findings for classroom instruction, and some indication of research directions that need to be taken during the 1980s. It supports the NCTM recommendations on calculator use.

(Elementary, Junior high, Recommendations, Research (summary), Roles, Secondary)

Weaver, J. Fred. Calculators and Unary Operations. School Science and Mathematics 81: 239-248; March 1981.

Calculator algorithms are used to illustrate and suggest ways in which calculators can facilitate unary operations at the pre-algebra level.

(Algorithms, Calculator keys, Functions, Iteration, Junior high)

Weaver, J. F. On Design Differences of Some RPN Calculators. MATYC Journal 15: 190-193; Fall 1981.

Two different designs of RPN calculators are compared: in one the contents of the T register are always retained; in the other, the contents of the T register are lost whenever the problem involves a stack of more than three levels.

(Calculator logic, Calculator memory)

Webb, Nigel. How Many Significant Figures? Mathematics in School 9: 15-15; November 1980.

The criteria for determining the appropriate number of significant digits in calculator computations is investigated.

(Science, Secondary, Significant figures)

Wier, Maruice D. Calculator Clout: Programming Methods for Your Programmable. Englewood Cliffs, New Jersey: Prentice-Hall, 1981.

Programming techniques for programmable calculators are illustrated.

(Programmable calculators, Programming)

Weiss, J. B. and Weiss, J. Use of the Talking Calculator to Improve Mathematical Skills. Journal of Visual Impairment and Blindness 75: 61; 1981.

A study in which 35 visually impaired adults were given training in basic arithmetic skills with a talking calculator is described. There was an eighty-seven percent improvement in mean posttest scores over mean pretest scores.

(Basic mathematics, Handicapped (blind), Research)

Wiebe, James H. Using a Calculator to Develop Mathematical Understanding. Arithmetic Teacher 29: 36-38; November 1981.

Methods are described for using the four-function counting calculator for developing understanding of the meaning of square roots and basic operations on whole and rational numbers. The refinement of estimates is used.

(Activities, Elementary (grades 3-6), Estimation, Four-function calculators, Mixed operations)

Wild, Walter J. Euler's Three-Body Problem. American Journal of Physics 48: 297-301; April 1980.

This article shows how the complex equations for a specific three-body problem can be solved on a small programmable calculator. A calculator program that performs iterations is presented in a small section.

(College, Iteration, Programmable calculators, Science)

Williams, David E. Skill Master. Scholastic Math 17 October 1980; 7 November 1980; 7 November 1980; 21 November 1980; 5 December 1980; 16 January 1981.

This is a collection of calculator games and activities that reinforce mathematical skills and concepts.

(Activities, Elementary, Games)

Williams, David E. The Language of Calculators. Arithmetic Teacher 28: 22-25; January 1981.

Procedures and instructional advantages for learning the language of different makes and models of calculators are outlined.

(Calculator keys, Calculator logic, Calculator memory)

Williams, David E. Calculator Activities. Instructor 90: 154-158; February 1981.

Five calculator games for elementary and junior high students are included.

(Elementary, Games, Junior high, Teachers)

Williams, David E. Test Your Calculator IQ. Teacher 68-70; February 1981.

A quiz to test "calculator IQ" is presented; it can prepare teachers for the questions about calculators students typically ask.

(Elementary, Four-function calculators, Junior high, Teachers)

Willis, Graham. Editorial. Australian Mathematics Teacher 35: 3; November 1979.

This editorial is a call for a whole-hearted re-appraisal of the mathematics curriculum to incorporate the micro-processor. It is necessary to develop the mathematical skills required for computing devices to be used intelligently in problem solving.

(Recommendations)

Winkles, Jim. Better Mathematics and More Problem Solving with a Calculator. Mathematics Teaching 96: 19-23; September 1981.

Interesting examples showing the use of calculators with arithmetic, square roots, graphs, equations, and trigonometry are given.

(Activities, Algebra, Functions, Junior high, Mixed operations, Roots, Secondary, Trigonometry)

Woodward, Ernest. Calculators with a Constant Arithmetic Feature. Arithmetic Teacher 29: 40-41; October 1981.

Activities making use of the constant arithmetic feature of many calculators are described in detail. This feature is recommended for elementary school use.

(Activities, Calculator keys, Elementary, Four-function calculators, Selection)

Worth, Joan. Action for Middle Schoolers. Arithmetic Teacher 28: 2; January 1981.

NCTM's An Agenda for Action recommends that the mathematics curriculum take full advantage of the power of calculators and computers. The significance of this recommendation to middle schoolers is discussed in one small section.

(Recommendations)

Writt, Elinor J. Mr. Manning's Money. Arithmetic Teacher 29: 27; September, 1981.

A little problem demonstrating the use of a calculator is presented with a straight-foward solution and a more difficult solution.

(Four-function calculators, Junior high (grade 7), Problem solving)

Yob, P. C. Calculators for Photographers. Petersen's Photographic Magazine 10: 75-78; September 1981.

(Technical mathematics)

To a Beginning with a Calculator in Instruction. Dusseldorf, West Germany: Padagogischer Verlag Schwann, 1980.

(Activities)

Calculator Activity Worksheets. Nottingham, England: Shell Centre for Mathematical Education, 1980.

This is a set of worksheets organized specifically for teaching basic arithmetic with the use of a calculator.

(Elementary (grades 1-6), Worksheets)

A Calculator Crossword Puzzle. MATYC Journal 15: 148; Spring 1981.

(Activities)

The Calculator Goes to School. Charlotte, North Carolina: Walter J. Klein Company, Ltd., 1981.

Ideas for using calculators in schools are given.

(Activities)

Casio Electronics. A Square Root Algorithm. Mathematics Teaching 79: 35; June 1977.

The algorithm used to calculate square roots on the Casio Memory 8 calculator is given.

(Algorithms, Roots, Scientific calculators)

Consumer Reports 45: 295-300; December 1980.

(Selection)

Consumer's Research Magazine 64: 33-37; June 1981.

(Selection)

Diversions. Australian Mathematics Teacher 35: 36; November 1979.

Some activities for calculator experimentation are presented.

(Activities, Secondary)

Exploration of the Use of "Programmed" Calculators in Remedial and Special Needs Math Programs at the Secondary Level. Final Report of Project, September 14, 1978, to June 15, 1979. New Brunswick, New Jersey: Middlesex County Vocational and Technical High Schools, 1979. ERIC: ED 193 429.

This project investigated the effect of placing one programmable calculator in each of five remedial mathematics labs and one in a special needs mathematics classroom. Teachers recommended continued use of the calculator, and regarded it as an effective motivator. Students' attitudes were positive toward use of the calculator, and they experienced "feelings of accomplishment in mathematics."

(Attitudes, Learning disabilities, Programmable calculators, Remedial, Research, Secondary, Technical mathematics)

Los Angeles Unified School District. Calculator Concepts, Student Practice Cards. Los Angeles: Instructional Planning Division, 1976.

Suggested practice exercises for students in the use of calculators. Many lessons require that students look for patterns and write rules for those observed. Recommended for grades seven through nine.

(Junior high (grades 7-9), Pattern searches, Worksheets)

Los Angeles Unified School District. Using a Calculator: Improving Computational Skills and Understanding Mathematical Concepts. Los Angeles: Instructional Planning Division, 1975.

Describes the use of the four-function calculator and reviews basic number sequences and operations. Recommended for grades four through six.

(Elementary (grades 4-6), Four-function calculators, Kit)

Mathematical Association Teaching Committee (Calculators Sub-committee). A Short List of Useful References (revised January 1981.) Mathematics in School 10: 21-22; September 1981.

A list of references selected for easy availability and direct relevance to the classroom is provided.

(References (selected)

Microcalculators in Schools? Uchitelskaya Gazeta 116: 150, 13: 198-1981.

(Elementary, Pros/cons, Secondary)

Proceedings of the 1980 Meeting (of the) Canadian Mathematics Education Study Group. Quebec, Canada: Laval University, March 1981. ERIC: ED 204 120. Pp. 132-148.

Four discussions on calculators are presented: the situation at the international level, the current situation in Canada, extension of a project in England, and calculator accuracy. The appendix is a detailed synthesis of the national reports on calculator usage by 16 countries.

(Status report)

SMTS (Saskatchewan Mathematics Teachers' Society) Position Paper: Calculators (1980). delta-K 20: 21-28; June 1981.

The rationale for the use of calculators in the classroom, the history of simple calculators, and some characteristics of various calculators are discussed. Three sample lessons are given.

(Pros/cons, Recommendations, Selection, Worksheets)

Start Your Motors! Aardvard Calculator Math Program. Walnut Creek, California: Aardvard Media, 1975.

(Activities)

Victorian Survey on Calculator Usage in Post-Primary Schools. Australian Mathematics Teacher 35: 15; November 1979.

The results of a survey of 140 mathematics educators concerning the use, availability and desirability of calculators are given.

(Elementary (grades 4-6), Junior high, Pros/cons, Research (survey), Secondary, Status report)

INDEX

This index is designed to help the user locate references to designated areas of concern related to the use of calculators in education. It should be noted that the cross-referencing is not exhaustive: there may be other references which could be pertinent, but have been omitted due to oversight.

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