

Karen C. Fuson

Professor Emerita
School of Education and Social Policy
2115 North Campus Drive
Northwestern University
Evanston, Illinois 60208
fuson@northwestern.edu

Joint Appointment:
Department of Psychology
Affiliated Faculty:
Institute of the Learning
Sciences

Current address: 11007 Noble Lane, San Diego, CA 92131

Northwestern faculty page: <http://www.sesp.northwestern.edu/profile/?p=61>

University Education

- Ph.D. University of Chicago 1972
Area: The Study of Teacher Education with emphases in mathematics and psychology
Dissertation: The Effects on Pre-Service Elementary Teachers of Learning Mathematics and Means of Teaching Mathematics Through the Active Manipulation of Materials.
- M.A.T. University of Chicago 1967
Area: Mathematics Education
Thesis: An Inner-City High School Remedial Course in Mathematics
- B.A. Oberlin College, Oberlin, Ohio, Cum Laude 1965
Major: Mathematics. Spent junior year in independent study at University of Edinburgh, Edinburgh, Scotland.

Honors

1986 National Council of Teachers of Mathematics Research Award

National Academy of Education 1978 Spencer Fellow

TTT (Trainers of Teacher Trainers) Fellowship for Ph.D. work

University of Chicago Fellowship for M.A.T. work.

B.A. Cum Laude

Honors in English literature, University of Edinburgh (fifth in class of 350).

National Service on National Research Council (NRC) Committees or NRC books

Mathematics Learning Study Committee, report: Adding It Up, 2001

How Students Learn, 2005, a result of a subset of the Committee on Developments in the Science of Learning, report: How People Learn, 1999

Committee on Early Childhood Mathematics, report Mathematics learning in early childhood: Paths toward excellence and equity, 2009.

Work on the Common Core State Standards Mathematics

On the Feedback Team for the Common Core State Standards for Mathematics. This team worked with the Working Group writing the standards.

A member of the writing team for the standards progressions describing progressions in and relationships among the Common Core standards.

Grants

Spencer Mentor Grant, 2000-2002. \$50,000 for "Cross-Cultural Studies of East Asian and United States Mathematics Learning and Teaching."

National Science Foundation, 1999-2002. \$999,987 for research and materials development on "Children's Math Worlds" replacement units. ESI-9816320

National Science Foundation, 1998-2003. \$1,564,435. for research on "Building Algebraic, Multiplication/Division/Fraction, and Measurement Understandings in Urban Classrooms in English and in Spanish" with Bruce Sherin and Yolanda De La Cruz. RED-935373

James S. McDonnell Foundation, 1997-2002. \$670,097. for research on "Developing a learn-while-teaching mathematics curriculum: Stimulating teacher reflection on student learning" with Yolanda De La Cruz, Miriam Gamoram Sherin, and James Spillane

Annenberg Initiative, 1999-2000. \$220,000 for "Integrating an urban mathematics initiative into comprehensive school change" in collaboration with Tony Bryk, University of Chicago

Dwight D. Eisenhower Professional Development Program, 1997. \$80,000. for "Developing teacher leaders for Latino and other non-mainstream student mathematics success"

National Science Foundation, 1993-1997. \$990,916 for research on "Latino children's thinking" REC-9806020

Spencer Foundation, 1993-1998. \$312,875 for research on "Supporting urban Latino children's constructions of arithmetical understandings by using parent tutors in the school"

National Science Foundation, 1993-1998. \$718,700 for research on "A longitudinal study of Everyday Mathematics"

University of Wisconsin Center For Education Research, 1991-95. \$160,000. Urban Hispanic children's understanding of addition and subtraction problem situations.

Northwestern University Research Committee, 1990-91. \$3569. Cooperative groups as climates for invented strategies in mathematics.

University of Wisconsin Center For Education Research, 1989-90. \$3600. Organizing a conference of researchers examining children's multidigit addition and subtraction and place value learning.

University of Wisconsin Center For Education Research, 1988-89. \$2750. The development of a working group in the area of multidigit addition and subtraction and place-value concepts.

Amoco Foundation, 1986-87. \$15,000. Teaching word problems to primary school children.

Amoco Foundation, 1985-86. \$50,000. Improving the teaching of elementary school mathematics.

Amoco Foundation, 1984-85. \$44,930. Improving the teaching of elementary school mathematics.

Amoco Foundation, 1983-84. \$10,000. Improving the teaching of elementary school mathematics.

Northwestern University Research Committee, 1982-83. \$910 for "Counting on the Apple."

Spencer Foundation, 1982-84. \$9,500 for "The Microcomputer and the Learning of Number Concepts: An Exploration of Educational and Research Uses."

National Science Foundation/National Institute of Education, 1978-1980. \$88,006 for research on "The Logical, Mathematical, and Psychological Structure of Counting and of Early Number Concepts."

National Academy of Education 1978 Spencer Fellowship, 1978-1983. \$8,000 to be spent for the support of research related to education.

Northwestern University Research Committee, 1976-77. \$2,276.00 for "Exploratory Studies in the Development of Egocentrism in Young Children."

Website

My website karenfusonmath.com contains my publications that can be sorted by math topic, recent papers given at conferences, many videos of my research in classrooms, and 22 hours of Teaching Progressions I developed to explain the learning progressions in the Common Core State Standards Math and to show visual supports for student understanding. The examples in these Teaching Progressions come from my research-based Prekindergarten to Grade 6 math program *Math Expressions* published by Houghton Mifflin Harcourt and now supported by Heinemann. Visual supports are very important in the Common Core State Standards Math and in all effective teaching/learning, so these Teaching Progressions can help teachers and other educators or parents understand the learning progressions and how students can be learning in the classroom. These learning progressions come from the international research base, so the Teaching Progressions based on this research can be helpful to teachers anywhere in the world. The Teaching Progressions are Powerpoint slides with my voice-overs explaining math content and teaching/learning issues. These can be used in flexible ways by individual or groups of teachers, districts, or state departments of education. There now also is a Teaching Progression on PK explaining the contents and how they reflect the recommendations of the National Academy of Sciences report on Early Mathematics. The classroom videos show these learning supports in action in classrooms and show students explaining their thinking. Most of the students in the videos come from backgrounds of poverty, and many are learning English as a second language. Finally, there now is a new section on Remote Teaching Materials to support meaningful teaching and learning in the covid crisis or later.

Print Publications

Research Books and Monographs

Fuson, K. C., & Geeslin, W. (Eds.) (1979). Explorations in the modeling of the learning of mathematics. Columbus, Ohio: ERIC/SMEAC.

Fuson, K. C. (1988). Children's counting and concepts of number. New York: Springer-Verlag.

Fuson, K. C., & Carpenter, T. P. (Eds.) (1990). Learning and teaching place value and multidigit addition and subtraction. Madison, WI: Wisconsin Center for Education Research.

Book for Teaching Teachers

Bell, M. S., Fuson, K. C., & Lesh, R. A. (1976). Algebraic and arithmetic structures: A concrete approach for elementary school teachers. New York: The Free Press. One of two books out of ninety reviewed in the American Mathematical Monthly (October, 1976) awarded two asterisks (one asterisk is "special positive emphasis").

Books for Teachers

Hiebert, J., Carpenter, T., Fennema, E., Fuson, K. C., Wearne, D., Murray, H., Olivier, A., Human, P., (1997). Making sense: Teaching and learning mathematics with understanding. Portsmouth, NH: Heinemann.

National Council of Teachers of Mathematics (NCTM) (2009). Focus in Grade 5: Teaching with Curriculum Focal Points. Reston, VA: NCTM.

National Council of Teachers of Mathematics (NCTM) (2010). Focus in Prekindergarten: Teaching with Curriculum Focal Points. Reston, VA: NCTM.

National Council of Teachers of Mathematics (NCTM) (2010). Focus in Kindergarten: Teaching with Curriculum Focal Points. Reston, VA: NCTM.

National Council of Teachers of Mathematics (NCTM) (2009). Focus in Grade 1: Teaching with Curriculum Focal Points. Reston, VA: NCTM.

National Council of Teachers of Mathematics (NCTM) (2011). Focus in Grade 2: Teaching with Curriculum Focal Points. Reston, VA: NCTM.

Invited Overview Chapter for Teachers

Fuson, K. C., Kalchman M., & Bransford, J. D. (2005). Mathematical understanding: An introduction. In M. S. Donovan and J. D. Bransford (Eds.), How students learn: Mathematics in the classroom (pp. 217-256). Washington, DC: National Academy Press. [This paperback book contains the introductory and final chapter and the four mathematical chapters from the next book.]

Fuson, K. C., Kalchman, M., & Bransford, J. D. (2005). Mathematical understanding: An introduction. In M. S. Donovan and J. D. Bransford (Eds.), How students learn: History,

math, and science in the classroom (pp. 217-256). Washington, DC: National Academy Press.

Invited Review or Overview Chapters in Handbooks or Encyclopedias

Fuson, K. C. (1992). Mathematics education, elementary. In M. C. Alkin (Ed.), Encyclopedia of educational research (6th ed.) (pp. 776-786). New York: Macmillan.

Fuson, K. C. (1992). Research on whole number addition and subtraction. In D. Grouws (Ed.), Handbook of research on mathematics teaching and learning (pp. 243-275). New York: Macmillan.

Fuson, K. C. (2003). Developing mathematical power in whole number operations. In J. Kilpatrick, W. G. Martin, & D. Schifter (Eds.), A research companion to principles and standards for school mathematics (pp. 68-94). Reston, Va: National Council of Teachers of Mathematics.

Fuson, K. C. (2009). Mathematics. In R. A. Shweder et al. (Eds.), The Child: An encyclopedic companion, pp.596-7. Chicago: University of Chicago Press.

Fuson, K. C., Murata, A., Abrahamson, D. (2015). Using learning path research to balance mathematics education: Teaching/learning for understanding and fluency. In R. Cohen Kadosh & A. Dowker (Eds.), *Oxford Handbook of Numerical Cognition* (pp. 1020-1038). Oxford, England: Oxford University Press. [Also appears online in *Oxford Handbooks Online, July, 2014*. DOI: 10.1093/oxfordhb/9780199642342.013.003]

Invited Research Review Chapters in Books

Fuson, K. C. (1979). The development of self-regulating aspects of speech: A review. In G. Zivin (Ed.), The development of self-regulation through speech (pp. 133-215). New York: John Wiley.

Fuson, K. C., Richards, J., & Briars, D. J. (1982). The acquisition and elaboration of the number word sequence. In C. Brainerd (Ed.), Progress in cognitive development: children's logical and mathematical cognition, Vol. 1 (pp. 33-92). New York: Springer-Verlag.

Reprinted in Thinking Mathematics, Vol. 1T. Washington, D.C.: The American Federation of Teachers, in press.

Fuson, K. C., & Hall, J. W. (1983). The acquisition of early number word meanings: A conceptual analysis and review. In H. Ginsburg (Ed.), Children's mathematical thinking (pp. 49-107). New York: Academic Press.

Fuson, K. C. (1992). Research on learning and teaching addition and subtraction of whole numbers. In G. Leinhardt, R. T. Putnam, & R. A. Hatrup (Eds.), The analysis of arithmetic for mathematics teaching (pp. 53-187). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Fuson, K. C. (2004). Pre-K to Grade 2 goals and standards: Achieving mastery for all. In Clements, D. H, Sarama, J., & DiBiase, A.-M. (Eds.). Engaging young children in mathematics: Standards for early childhood mathematics education (pp. 105-148). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Invited Empirical or Overview Chapters in Books

- Fuson, K. C. (1982). An analysis of the counting-on solution procedure in addition. In T. Romberg, T. Carpenter, & J. Moser (Eds.), Addition and subtraction: A developmental perspective (pp. 67-81). Hillsdale, N. J.: Lawrence Erlbaum.
- Fuson, K. C. (1987). Teaching addition, subtraction, and place-value concepts. In I. Wirszup & R. Streit (Eds.), Developments in school mathematics education around the world (pp. 430-459). Reston, VA: National Council of Teachers of Mathematics.
- Fuson, K. C. (1991). Children's early counting: Saying the number-word sequence, counting objects, and understanding cardinality. In K. Durkin & B. Shire (Eds.), Language and mathematical education (pp. 27-39). Milton Keynes, GB: Open University Press.
- Fuson, K. C. & Kwon, Y. (1991). Chinese-based regular and European irregular systems of number words: The disadvantages for English-speaking children. In K. Durkin & B. Shire (Eds.), Language and mathematical education (pp. 211-226). Milton Keynes, GB: Open University Press.
- Fuson, K. C. (1991/1992). Relations entre comptage et cardinalite chez les enfants de 2 a 8 ans/Relationships between counting and cardinality from age 2 to age 8. In J. Bideaud, J. P. Fischer, & C. Meljac (Eds.), Les chemins du nombre/Pathways to number (pp. 159-179/127-149). Villeneuve d'Ascq, France: Presses Universitaires de Lille/Hillsdale, NJ: Lawrence Erlbaum Associates. [This is a book of invited chapters celebrating the fiftieth anniversary of the publication of Piaget's book on number.]
- Fuson, K. C. & Kwon, Y. (1991/1992). Systemes de mots nombres et autres outils culturels: Effets sur les premiers calculs de l'enfant/Learning addition and subtraction: Effects of number words and other cultural tools. In J. Bideaud & C. Meljac (Eds.), Les chemins du nombre/Pathways to number (pp. 351-374/283-306). Villeneuve d'Ascq, France: Presses Universitaires de Lille/Hillsdale, NJ: Lawrence Erlbaum Associates. [This is a book of invited chapters celebrating the fiftieth anniversary of the publication of Piaget's book on number.]
- Fuson, K. C., Fraivillig, J. L., & Burghardt, B. H. (1992). Relationships children construct among English number words, multiunit base-ten blocks, and written multidigit addition. In J. Campbell (Ed.), Advances in psychology: The nature and origins of mathematical skills (39-112). North Holland, Elsevier Science.
- Fuson, K. C., & Fraivillig, J. L. (1993). Supporting children's ten-structured thinking in the classroom. In G. Bell (Ed.), Asian Perspectives on Mathematics Education (pp. 42-55). Northern Rivers, Australia: Northern Rivers Mathematical Association.
- Fuson, K. C., Perry, T., & Kwon, Y. (1994). Latino, Anglo, and Korean children's finger addition methods. In J. E. H. van Luit (Ed.), Research on learning and instruction of mathematics in kindergarten and primary school, pp. 220-228. Doetinchem/Rapallo: Graviant.
- Fuson, K. C., & Smith, S. T. (1997). Supporting multiple 2-digit conceptual structures and calculation methods in the classroom: Issues of conceptual supports, instructional design, and language. In M. Beishuizen, K. P. E. Gravemeijer, & E. C. D. M. van Lieshout (Eds.), The role of contexts and models in the development of mathematical strategies and procedures (163-198). Utrecht, The Netherlands: CD-B Press/The Freudenthal Institute.

- Carpenter, T. P., Fennema, E., Fuson, K., Hiebert, J., Human, P., Murray, H., Olivier, A., & Wearne, D. (1999). Learning basic number concepts and skills as problem solving. In E. Fennema & T. A. Romberg (Eds.), Mathematics classrooms that promote understanding (pp. 45-61). Mahwah, NJ: Erlbaum Associates.
- Fuson, K. C. & Burghardt, B. H. (2003). Multi-digit addition and subtraction methods invented in small groups and teacher support of problem solving and reflection. In A. Baroody & A. Dowker (Eds.) The development of arithmetic concepts and skills: Constructing adaptive expertise (pp. 267-304). Hillsdale, NJ: Erlbaum.
- Fuson, K. C. & Abrahamson, D. (2005). Understanding ratio and proportion as an example of the Apprehending Zone and Conceptual-Phase Problem-Solving Models. In J. Campbell (Ed.), Handbook of Mathematical Cognition (pp. 213-234). New York: Psychology Press.
- Fuson, K. C., & Li, Y. (2014). Learning paths and learning supports for conceptual addition and subtraction in the US Common Core State Standards and in the Chinese Standards. In Y. Li & G. Lappan (Eds.), Mathematics Curriculum in School Education (pp. 541-558). Dordrecht, Germany: Springer.
- Fuson, K. C. (2018) Building on Howe's three pillars in kindergarten to grade 6 classrooms. In Y. Li, W. J. Lewis, & J. J. Madden (Eds.), *Mathematics Matters in Education* (185-207). Switzerland: Springer International Publishing AG.
- Murata, A., Fuson, K. C., & Abrahamson, D. (2020). A learning path framework for balancing mathematics education: Teaching and Learning for understanding and fluency. In E. A. Ortiz (Inter-American Development Bank), J. Cristia (Inter-American Development Bank, & S. Cueto (GRADE and Pontificia Universidad Católica del Perú) (Eds.). *Learning mathematics in the XXI century: Adding technology to the equation. (Aprendiendo matematica en el siglo XXI: a sumar con tecnologia.)* Washington D.C.: Inter-American Development Bank.

Chapters in Research Mongraphs

- Fuson, K. C. (1978). An analysis of research needs in projective, affine, and similarity geometries, including an evaluation of Piaget's results in these areas. In R. Lesh & D. Mierkiewicz (Eds.), Recent research concerning the development of spatial and geometric concepts (pp. 243-260). Columbus, OH: ERIC/SMEAC.
- Fuson, K. C., & Murray, C. (1978). The haptic-visual identification, construction, and drawing of geometric shapes by children aged two to five: A Piagetian extension. In R. Lesh & D. Mierkiewicz (Eds.), Recent research concerning the development of spatial and geometric concepts (pp. 49-83). Columbus, OH: ERIC/SMEAC.
- Fuson, K. C. (1979). Towards a model for the learning of mathematics as goal-directed activity. In K. Fuson & W. Geeslin (Eds.), Explorations in the modeling of the learning of mathematics (pp. 140-158). Columbus, OH: ERIC/SMEAC.
- Fuson, K. C. (1980). An explication of three theoretical constructs from Vygotsky. In T. Kieren (Ed.), Recent Research on Number Learning (pp. 1-25). Columbus, OH: ERIC/SMEAC.

Chapters in Books for Teachers

- Fuson, K. C., Lo Cicero, A., Hudson, K., & Smith, S. T. (1997). Snapshots across two years in the life of an urban Latino classroom. In Hiebert, J., Carpenter, T., Fennema, E., Fuson, K. C., Wearne, D., Murray, H., Olivier, A., Human, P., Making sense: Teaching and learning mathematics with understanding (pp. 129-159). Portsmouth, NH: Heinemann.
- Lo Cicero, A., Fuson, K. C., & Alexah-Snyder, M. (1999). Making a difference in Latino children's math learning: Listening to children, mathematizing their stories, and supporting parents to help children. In L. Ortiz-Franco, N. G. Hernandez, & Y. De La Cruz (Eds.), Changing the faces of mathematics: Perspectives on Latinos (pp. 59-70). Reston, Virginia: National Council of Teachers of Mathematics.
- Fuson, K. C., De La Cruz, Y., Smith, S., Lo Cicero, A., Hudson, K., Ron, P., & Steeby, R. (2000). Blending the best of the 20th century to achieve a Mathematics Equity Pedagogy in the 21st century. In M. J. Burke & F. R. Curcio (Eds.), Learning mathematics for a new century (pp. 197-212). Reston, VA: NCTM.
- Fuson, K. C., Smith, S. T., & Lo Cicero, A. (2002). Supporting Latino first graders' ten-structured thinking in urban classrooms. In J. Sowder & B. Schappelle (Eds.), *Lessons Learned from Research* (pp. 155-162). Reston, VA: NCTM.
- Hufferd-Ackles, K., Fuson, K. C., & Sherin, M. G. (2015). Describing levels and components of a Math-Talk Learning Community. In E. A. Silver & P. A. Kenney (Eds.), *More lessons learned from research: Volume 1: Useful and usable research related to core mathematical practices* (pp. 125-134). Reston, VA: NCTM.
- Murata, A. & Fuson, K. C. (2016). Class learning zone and class learning paths: Responsive teaching in first-grade mathematics. In E. A. Silver & P. A. Kenney (Eds.), *More lessons learned from research: Volume 2: Useful and usable research related to core mathematical practices* (pp. 70-91). Reston, VA: NCTM.
- Sherin, B. Fuson, K. C. (2016). Multiplication and division methods in the context of the Common Core State Standards. In E. A. Silver & P. A. Kenney (Eds.), *More lessons learned from research: Volume 2: Useful and usable research related to core mathematical practices* (pp. 101-108). Reston, VA: NCTM.

Journal Articles

- Fuson, K. C. (1975). The effects on preservice elementary teachers of learning mathematics and means of teaching mathematics through the active manipulation of materials. Journal for Research in Mathematics Education, 6, 51-62.
- Reprinted in the North Carolina Mathematics Education, Fall, 1976.
- Fuson, K. C. (1976). Piagetian stages in causality: Children's answers to "why?". Elementary School Journal, 77(2), 150-158.
- Reprinted in J. R. Hranitz & A. M. Noakes (Eds.), Working with the young child: A text of readings-II. University of America Press, 1978. Selected for referencing in Sociological Abstracts.

Olszewski, P., & Fuson, K. C. (1982). The verbally expressed fantasy play of preschoolers as a function of toy structure. Developmental Psychology, 18, 57-61.

Fuson, K. C., Secada, W. G., & Hall, J. W. (1983). Matching, counting, and conservation of numerical equivalence. Child Development, 54, 91-97.

Secada, W. G., Fuson, K. C., & Hall, J. W. (1983). The transition from counting-all to counting-on in addition. Journal for Research in Mathematics Education, 14, 47-57.

Fuson, K. C. (1984). More complexities in subtraction. Journal for Research in Mathematics Education, 15, 214-225.

Pergament, G., & Fuson, K. C. (1984). Collective nouns, cardinality, and accurate counting skills. In Archives Jean Piaget, X.

Fuson, K. C., & Brinko, K. T. (1985) The comparative effectiveness of microcomputers and flashcards in the drill and practice of basic math facts. Journal for Research in Mathematics Education, 16, 225-232.

Fuson, K. C., Pergament, G. G., & Lyons, B. G. (1985). Collection terms and preschoolers' use of the cardinality rule. Cognitive Psychology, 17, 315-323.

Fuson, K. C., Pergament, G. G., Lyons, B. G., & Hall, J. W. (1985). Children's conformity to the cardinality rule as a function of set size and counting accuracy. Child Development, 56, 1429-1436.

Fuson, K. C. (1986). Roles of representation and verbalization in the teaching of multi-digit addition and subtraction. European Journal of Psychology of Education, 1, 35-56.
Invited paper for a special issue on mathematics.

Fuson, K. C. (1986). Teaching children to subtract by counting up. Journal for Research in Mathematics Education, 17, 172-189.

This paper was chosen as the best research article of 1986 by the Research Advisory Council of the National Council of Teachers of Mathematics.

Fuson, K. C. & Olszewski, P. (1986). Preschoolers' dyadic speech about nonpresent entities during joint play. Discourse Processes, 9, 221-233.

Fuson, K. C., & Secada, W. G. (1986). Teaching children to add by counting on with finger patterns. Cognition and Instruction, 3, 229-260.

Hall, J. W., & Fuson, K. C. (1986). Presentation rate and experiments on mnemonics: A methodological note. Journal of Educational Psychology, 78, 233-234.

Stigler, J., Fuson, K. C., Ham, M., & Kim, M. S. (1986). An analysis of addition and subtraction word problems in Soviet and American elementary textbooks. Cognition and Instruction, 3, 153-171.

Fuson, K. C., Lyons, B. G., Pergament, G., Hall, J. W., & Kwon, Y. (1988). Effects of collection terms on class inclusion and number tasks. Cognitive Psychology, 20, 96-120.

Reprinted in Jean Piaget: Critical Assessment, L. Smith. (Ed.), London: Routledge, Chapman and Hall Ltd. (1993).

- Fuson, K. C., Stigler, J., Bartsch, K. (1988). Grade placement of addition and subtraction topics in China, Japan, the Soviet Union, Taiwan, and the United States. Journal for Research in Mathematics Education, 19, 449-458.
- Fuson, K. C., & Willis, G. B. (1988). Subtracting by counting up: More evidence. Journal for Research in Mathematics Education, 19, 402-420.
- Hall, J. W., & Fuson, K. C. (1988). Presentation rates, item characteristics, and the keyword method: A reply to Pressley. Journal of Educational Psychology, 80, 251-252.
- Willis, G. B., & Fuson, K. C. (1988). Teaching representational schemes for solving addition and subtraction word problems. Journal of Educational Psychology, 80, 192-201.
- Fuson, K. C., & Willis, G. B. (1989). Second graders' use of schematic drawings in solving addition and subtraction word problems. Journal of Educational Psychology, 81, 514-520.
- Fuson, K. C. (1990). Issues in place-value and multidigit addition and subtraction learning. Journal for Research in Mathematics Education, 21, 273-280.
- Fuson, K. C., & Briars, D. J. (1990). Base-ten blocks as a first- and second-grade learning/teaching approach for multidigit addition and subtraction and place-value concepts. Journal for Research in Mathematics Education, 21, 180-206.
- Fuson, K. C. (1990). Conceptual structures for multiunit numbers: Implications for learning and teaching multidigit addition, subtraction, and place value. Cognition and Instruction, 7, 343-403.
- Fuson, K. C. & Fuson, A. M. (1992). Instruction to support children's counting on for addition and counting up for subtraction. Journal for Research in Mathematics Education, 23, 72-78.
- Fuson, K. C. & Kwon, Y. (1992). Korean children's understanding of multidigit addition and subtraction. Child Development, 63, 491-506.
- Fuson, K. C. & Kwon, Y. (1992). Korean children's single-digit addition and subtraction: Numbers structured by ten. Journal for Research in Mathematics Education, 23. 148-165.
- Fuson, K. C., & Smith, S. T. (1995). Complexities in learning two-digit subtraction: A case study of tutored learning. Mathematical Cognition, 1, 165-213.
- Hiebert, J., Carpenter, T., Fennema, E., Fuson, K. C., Murray, H., Olivier, A., Human, P., & Wearne, D. (1996). Problem solving as a basis for reform in curriculum and instruction: The case of mathematics. Educational Researcher, 25(4), 12-21.
- Fuson, K. C., Carroll, W. M., & Landis, J. (1996). Levels in conceptualizing and solving addition/subtraction compare word problems. Cognition and Instruction, 14(3), 345-371.

- Fuson, K. C., Wearne, D., Hiebert, J., Human, P., Murray, H., Olivier, A., Carpenter, T., & Fennema, E. (1997). Children's conceptual structures for multidigit numbers at work in addition and subtraction. Journal for Research in Mathematics Education, 28, 130-162.
- Fuson, K. C., Smith, S. T., & Lo Cicero, A. (1997). Supporting Latino first graders' ten-structured thinking in urban classrooms. Journal for Research in Mathematics Education, 28, 738-766.
- Ho, C. S., & Fuson, K. C. (1998). Effects of language characteristics on children's knowledge of teens quantities as tens and ones: Comparisons of Chinese, British, and American kindergartners. Journal of Educational Psychology, 90, 536-544.
- Fuson, K. C. (1998). Pedagogical, mathematical, and real-world conceptual-support nets: A model for building children's mathematical domain knowledge. Mathematical Cognition, 4(2), 147-186.
- Fraivillig, J. L., Murphy, L. A., & Fuson, K. C. (1999). Advancing children's mathematical thinking in Everyday Mathematics reform classrooms. Journal for Research in Mathematics Education, 30, 148-170.
- Carroll, W. M., Fuson, K. C., & Drueck, J. V. (2000). A longitudinal study of second and third graders using the Standards-based curriculum Everyday Mathematics. Journal for Research in Mathematics Education, 31, 277-295.
- Carroll, W. M., Fuson, K. C., & Diamond, A. (2000). Use of student-constructed number stories in a reform-based curriculum. Journal of Mathematical Behavior, 19, 49-62.
- Hufferd-Ackles, K., Fuson, K. C., & Sherin, M. G. (2004). Describing levels and components of a math-talk community. Journal for Research in Mathematics Education, 35 (2), 81-116.
- Sherin, B. & Fuson, K. C. (2005). Multiplication strategies and the appropriation of computational resources. Journal for Research in Mathematics Education, 36 (4), 347-395.
- Murata, A., & Fuson, K. C. (2006). Teaching as assisting individual constructive paths within an interdependent class learning zone: Japanese first graders learning to add using ten. Journal for Research in Mathematics Education, 37 (5), 421-456.
- Fuson, K. C. & Murata, A. (2007). Integrating NRC principles and the NCTM Process Standards to form a Class Learning Path Model that individualizes within whole-class activities. National Council of Supervisors of Mathematics Journal of Mathematics Education Leadership, 10 (1), 72-91.
- Fuson, K. C. (2009). Avoiding misinterpretations of Piaget and Vygotsky: Mathematical teaching without learning, learning without teaching, or helpful learning-path teaching? Cognitive Development, 24, 343-361. doi:10.1016/j.cogdev.2009.09.009
- Fuson, K. C., Adler, T., Roedel, S., & Zaccariello, J. (2009). Building a nurturing, visual, Math-Talk teaching-learning community to support learning by English Language Learners and students from backgrounds of poverty. New England Mathematics Journal, (May) XLI, 6-16.
- Fuson, K. C. & Li, Y. (2009). Cross-cultural issues in linguistic, quantitative, and computational

supports for mathematical thinking. *ZDM – The International Journal on Mathematics Education*, 41, 793-808. DOI 10.1007/s11858-009-0183-7

Fuson, K. C. & Beckmann, S. (Fall/Winter, 2012-2013). Standard algorithms in the Common Core State Standards. *National Council of Supervisors of Mathematics Journal of Mathematics Education Leadership*, 14 (2), 14-30. Also at http://www.mathedleadership.org/docs/resources/journals/NCSMJJournal_ST_Algorithms_Fuson_Beckmann.pdf

Fuson, K.C., Clements, D.H., & Sarama, J. (2015). Making early math education work for all children. *Phi Delta Kappan*, 97 (3 November), 63-68. doi:10.1177/0031721715614831

Clements, D. H., Fuson, K. C., & Sarama, J. (2017). The research-based balance in early childhood mathematics: A response to Common Core criticisms. *Early Childhood Research Quarterly*, 40, 150-162.

Fuson, K. C. (2019). Relating math words, visual images, and math symbols for understanding and competence. *International Journal of Disability, Development and Education*, 66 (Special Issue 2 on Mathematics education research in the field of Down syndrome: Latest developments and emerging trends.), 119-132. <https://doi.org/10.1080/1034912X.2018.1535109> Published online October 27, 2018.

Clements, D. H., Fuson, K. C., & Sarama, J. (2019). Critiques of the Common Core in early math: A research-based response. *Journal for Research in Mathematics Education*, 50 (1), 11-22.

Fuson, K. C. (2019). Overcoming errors in fraction computation by emphasizing unit fractions, length drawings, and student explanations. *Universal Journal of Educational Research*, 7(8): 1663-1678, 2019 DOI: 10.13189/ujer.2019.070805

Fuson, K. C. (2020). The best multidigit computation methods: A cross-cultural cognitive, mathematical, and empirical analysis. *Universal Journal of Educational Research*, 8(4): 1299-1314, 2020 DOI: 10.13189/ujer.2020.080421

Fuson, K. C. & Leinwand, S. (2023). Building equitable Math Talk classrooms. *Mathematics Teacher Learning and Teaching*, 116 (3), March, 164-173. 2023 DOI: 10.5951/MTLT.2022.0285

Invited Research Commentaries

Fuson, K. C. (1988). Some further clarifications of numerical terminology using results from young children. *Behavioral and Brain Sciences*, 11, 583-585.

Fuson, K. C. (1995). Aspects and uses of counting: An AUC framework for considering research on counting to update the Gelman/Gallistel counting principles. *Cahiers de Psychologie Cognitive (Current Psychology of Cognition)*, 6(14), 724-731.

Fuson, K. C. (1997). Research-based mathematics curricula: New educational goals require programs of four interacting levels of research. Invited commentary on S. Griffin & R. Case, Re-thinking the primary school curriculum: An approach based on cognitive science. *Issues in Education*, 3 (1), 67-79.

Invited Commentaries

Fuson, K. (2011), The common core mathematics standards as supports for learning and teaching early and elementary school. In J. S. Carlson & J. R. Levin (Eds.), *Instructional strategies for improving student learning: Focus on early math and reading* (pp. 177-186). Vol. 3 in *Psychological perspectives on contemporary educational issues*. Charlotte, NC: Information Age Publishing.

Rejoinders

Hiebert, J., Carpenter, T., Fennema, E., Fuson, K. C., Murray, H., Olivier, A., Human, P., & Wearne, D. (1997). Making mathematics problematic: A rejoinder to Prawat and Smith. *Educational Researcher*, 26(2), 24-26.

Invited articles in encyclopedias

Fuson, K. C. (1984). Number and numeral. *World Book Encyclopedia*.

Fuson, K. C. (1984). Roman numerals. *World Book Encyclopedia*.

Fuson, K. C. (1986). The decimal system. *World Book Encyclopedia*.

Fuson, K. C. (1986). Fractions. *World Book Encyclopedia*.

Fuson, K. C. (2000). Arithmetic. *World Book Encyclopedia*.

Research-based articles for teachers

Fuson, K. C. (1987). Adding by counting on with finger patterns. *Arithmetic Teacher*, 35, 38-41. Invited paper; first article in the new "research into practice" series of articles.

Fuson, K. C. (1988). Subtracting by counting up with finger patterns. *Arithmetic Teacher*, 35(5), 29-31. Invited paper for the "research into practice" series.

Fuson, K. C. & Mills, V. L. (1997). What do we see in *Everday Mathematics* classrooms? Establishing an environment conducive to conceptual mathematics learning. *Teacher Link*, 5(2), 1-2.

Lo Cicero, A., De La Cruz, Y., Fuson, K. C. (1999). Teaching and learning creatively with the Children's Math Worlds Curriculum: Using children's narratives and explanations to co-create understandings. *Teaching Children Mathematics*, 5 (9), 544-547.

Fuson, K. C., Grandau, L., & Sugiyama, P. (2001). Achievable numerical understandings for all young children. *Teaching Children Mathematics*, 7(9), 522-526.

Fuson, K. C. (2003). Toward computational fluency in multidigit multiplication and division. *Teaching Children Mathematics*, 9(6), 300-305.

Beckman, S. & Fuson, K. C. (2008). Focal Points-Grades 5 and 6. *Teaching Children Mathematics*, 14(9), 505-516.

Clements, D.H., Fuson, K. C., & Sarama, J. (2017). What is developmentally appropriate teaching? *Teaching Children Mathematics*, 24 (3), 178-188.

Papers in Conference Proceedings

- Fuson, K. C. (1980). The counting word sequence as a representational tool. In R. Karplus (Ed.), Proceedings of the Fourth International Conference for the Psychology of Mathematics Education (pp. 256-262). Berkeley: University of California.
- Pergament, G. G., & Fuson, K. C. (1982). Effects of size of set, homogeneity of objects, and collection nouns on children's accurate counting and use of the cardinality rule. In S. Wagner (Ed.), Proceedings of the Fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 78-84). Athens, Georgia: University of Georgia.
- Fuson, K. C. (1983). The development of counting words and of the counting act. In M. Zweng, T. Green, J. Kilpatrick, H. Pollak, & M. Suydam (Eds.), Proceedings of the Fourth International Congress on Mathematical Education (pp. 499-502). Boston: Birkhauser Boston.
- Fuson, K. C., & Hall, J. W. (1983). Early relations between counting and cardinality. In J. Bergeron & N. Herscovics (Eds.), Proceedings of the Fifth Annual Meeting of the International Group for the Psychology of Mathematics Education. Vol. I (pp. 259-266). Montreal: University of Montreal.
- Fuson, K. C., & Secada, W. G. (1983). The development of number word sequence skills. In J. Bergeron & N. Herscovics (Eds.), Proceedings of the Fifth Annual Meeting of the International Group for the Psychology of Mathematics Education. Vol. I (pp. 266-274). Montreal: University of Montreal.
- Fuson, K. C., & Hall, J. W. (1984). Introducing subtraction as counting up. In J. M. Moser (Ed.), Proceedings of the Sixth Annual Meeting of the International Group for the Psychology of Mathematics Education (pp. 9-14). Madison: Wisconsin Center for Education Research.
- Steinberg, R., Baroody, A., & Fuson, K. (1984). From counting to recall of number facts. In J. M. Moser (Ed.), Proceedings of the Sixth Annual Meeting of the International Group for the Psychology of Mathematics Education (pp. 253-262). Madison: Wisconsin Center for Education Research.
- Fuson, K. C. (1985). Teaching multi-digit addition and subtraction. In L. Streefland (Ed), Proceedings of the Ninth International Conference for the Psychology of Mathematics Education (pp. 316-321). Noordwijkerhout, The Netherlands: International Group for the Psychology of Mathematics Education.
- Hall, J. W., Fuson, K. C., & Willis, G. B. (1985). Teaching counting on for addition and counting up for subtraction. In L. Streefland (Ed), Proceedings of the Ninth International Conference for the Psychology of Mathematics Education (pp. 322-327). Noordwijkerhout, The Netherlands: International Group for the Psychology of Mathematics Education.
- Willis, G. B., & Fuson, K. C. (1985). Teaching representational schemes for the more difficult addition and subtraction verbal problems. In S. K. Damarin & M. Shelton (Eds.), Proceedings

of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 288-293). Columbus, Ohio.

- Fuson, K. C., & Willis, G. (1986). First and second graders' performance on compare and equalize word problems. In Proceedings of the Tenth International Conference on the Psychology of Mathematics Education (pp. 19-24). London: University of London Institute of Education.
- Fuson, K. C. (1988). First and second graders' ability to use schematic drawings in solving twelve kinds of addition and subtraction word problems. In M. J. Behr, C. B. Lacampagne, & M. M. Wheeler (Eds.), Proceedings of the Tenth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 364-370). DeKalb, IL: Northern Illinois University.
- Burghardt, B. & Fuson, K. (1990). Learning place value and multidigit addition and subtraction in small groups. In K. Fuson & T. Carpenter (Eds.), Learning and teaching place value and multidigit addition and subtraction. Madison, WI: Wisconsin Center for Education Research.
- Fraivillig, J. L., Fuson, K. C., & Thompson, P. W. (1993). Microworld support of children's understanding of multidigit addition. In Proceedings of the World Conference on Artificial Intelligence in Education (pp. 161-168), Edinburgh, UK.
- Fuson, K. C., & Burghardt, B. H. (1993). Group case studies of second graders inventing multidigit addition procedures for base-ten blocks and written marks. In J. R. Becker & B. J. Pence (Eds.), Proceedings of the Fifteenth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 240-246). The Center for Mathematics and Computer Science Education, San Jose State University, San Jose, CA.
- Fuson, K. C., Perry, T., & Ron, P. (1996). Developmental levels in culturally-different finger methods: Anglo and Latino children's finger methods of addition. In E. Jakubowski, D. Watkins, & H. Biske (Eds.), Proceedings of the 18th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, 2 (pp. 347-352). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Fuson, K. C., Smith, Steven T., & Lo Cicero, A. (1996). A design framework for teaching/learning activities supporting Latino first graders' ten-structured thinking in urban classrooms. In D. Edelson & E. Domeshek (Eds.) Proceedings of the International Conference on the Learning Sciences (pp. 83-90). Charlottesville, VA: Association for the Advancement of Computing in Education (AACE).
- Fuson, K. C., & Burghardt, B. H. (1997). Group case studies of second graders inventing multidigit subtraction methods. In J. A. Dossey, J. O. Swafford, M. Parmantie, & A.E. Dossey (Eds.), Proceedings of the 19th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, 1, (pp. 291-298). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Fuson, K. C., Sherin, B., & Smith, S. T. (1998). A Vygotskiiian action-research model for developing and assessing conceptual models and instructional materials inter-actively. In S. Berenson, K. Dawkins, M. Blanton, W. Coulombe, J. Kolb, K. Norwood, & L. Stiff (Eds.), Proceedings of the Twentieth Annual Meeting of the North American Chapter of the International Group for the

Psychology of Mathematics Education, Vol. 2 (pp. 541-548). Raleigh, NC: North Carolina State University.

- Moschkovich, J., & Fuson, K. (1998). Using socio-cultural theories in mathematics education research. In S. Berenson, K. Dawkins, M. Blanton, W. Coulombe, J. Kolb, K. Norwood, & L. Stiff (Eds.), Proceedings of the Twentieth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 2 (pp. 100-106). Raleigh, NC: North Carolina State University.
- Duncan, A., Lee, H., & Fuson, K. C. (2000). Pathways to early number concepts: Use of 5- and 10-structured representations in Japan, Taiwan, and the United States. In M. L. Fernandez (Ed.), Proceedings of the Twenty-Second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 2 (p. 452). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Fuson, K. C. & Lo Cicero, A. M. (2000). El Mercado in Latino primary math classrooms. In M. L. Fernandez (Ed.), Proceedings of the Twenty-Second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 2 (p. 453). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Izsák, A. & Fuson, K. C. (2000). Students' understanding and use of multiple representations while learning two-digit multiplication. In M. L. Fernandez (Ed.), Proceedings of the Twenty-Second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 2 (pp. 714-721). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Fuson, K. (2001). Toward a coherent network of learning goals for prekindergarten to grade 5. In R. Speiser, C. S. Maher, & C. Walter (Eds.), Proceedings of the Twenty-Third Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 2 (pp. 734-5). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Kalchman, M. & Fuson, K. (2001). Conceptual understanding of functions: A tale of two schemas. In R. Speiser, C. S. Maher, & C. Walter (Eds.), Proceedings of the Twenty-Third Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 1 (pp. 195-205). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Murata, A. & Fuson, K. (2001). Learning paths to 5- and 10-structured understanding of quantity: Addition and subtraction solution strategies of Japanese children. In R. Speiser, C. S. Maher, & C. Walter (Eds.), Proceedings of the Twenty-Third Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Vol. 2 (pp. 639-646). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.
- Fuson, K. and Kalchman, M. (2002). A length model of fractions puts multiplication of fractions in the learning zone of fifth graders. In D. L. Haury (Ed.), Proceedings of the twenty-fourth annual meeting of North American chapter of the International Group of the Psychology of Mathematics Education (pp. 1641 – 1649). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

Murata, A. and Fuson, K. C. (2002). Seeing U.S. reform teaching in a Japanese classroom: Mutual adaptations in first graders' learning tens additions. In D. L. Haury (Ed.). Proceedings of the twenty-fourth annual meeting of North American chapter of the International Group of the Psychology of Mathematics Education (pp. 915 – 925). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

Fuson, K. (2006). The U.S. context for improving mathematics teaching and learning. In Lewis, C. & Takahashi, A. (Eds.) 2006. *Learning Across Boundaries: U.S.-Japan Collaboration in Mathematics, Science and Technology Education*. Oakland, CA: Mills College School of Education

Conference Summarizer

Fuson, K. C. (1988). Meaning in middle grade number concepts. In M. J. Behr & J. Hiebert (Eds.), Research agenda in mathematics education: Number concepts and operations in the middle grades (pp. 260-264). Reston, VA: National Council of Teachers of Mathematics.

Fuson, K. (1990). New classrooms for learning and teaching place value and multidigit addition and subtraction. In K. Fuson & T. Carpenter (Eds.), Learning and teaching place value and multidigit addition and subtraction. Madison, WI: Wisconsin Center for Education Research.

Chapter Discussion

Fuson, K. C. (1981). More implications of research on young children's thinking for the curriculum of the 1980s. In E. Fennema, (Ed.), Research in mathematics education: Implications for the 80's (pp. 62-66). Alexandria, VA: The Association for Supervision and Curriculum Development.

Reviews and Critiques

Fuson, K. C. (1975). [An expanded abstract and critical review of Owens, Douglas T., Learning of equivalence and order relations by disadvantaged five- and six-year-old children. In L. P. Steffe (Ed.), Research on mathematical thinking of young children: Six empirical studies. Reston, VA: NCTM, 1975]. Investigations in Mathematics Education, 8, 43-47.

Fuson, K. C. (1976). [An expanded abstract and critical analysis of Wheatley, Grayson H., A comparison of two methods of column addition. Journal of Research in Mathematics Education, May, 1976.] Investigations in Mathematics Education, 9, 65-68.

Fuson, K. C. (1977). [An expanded abstract and critical analysis of Garigliano, L. J., Arithmetic computation scores: Or can children in modern mathematics programs really compute? School Science and Mathematics, 75, 1975, 399-412] Investigations in Mathematics Education, 10, 23-26.

Fuson, K. C. (1978). [An expanded abstract and critical analysis of Good., R., Mathews, C., Shymansky, J., & Penick, J., Relations between classroom behavior and cognitive development characteristics in elementary school children. Journal of Research in Science Teaching, 13,(6), 1976, 533-538.] Investigations in Mathematics Education, 11, 30-33.

- Fuson, K. C. (1979). [Review of The child's understanding of number by R. Gelman and C. R. Gallistel.] Journal for Research in Mathematics Education, 10, 383-387.
- Fuson, K. C. (1982). [A critical analysis of Houlihan, D. M., & Ginsburg, H. P., The addition methods of first- and second-grade children. Journal of Research in Mathematics Education, 1981, 12, 95-106]. Investigations in Mathematics Education, 15, pp. 17-25.
- Fuson, K. C. (1988). Complexities in representing mathematics [Review of Problems of representation in the teaching and learning of mathematics edited by C. Janvier.] Contemporary Psychology, 33, 630.
- Kwon, Y., & Fuson, K. C. (1988). [A critical analysis of Song, M., & Ginsburg, H. P., The development of informal and formal mathematical thinking in Korean and US children. Child Development, 58, 1286-96]. Investigations in Mathematics Education, 21, 51-57.

Curriculum Work

- Lashoff, R. K., & Fuson, K. C. "Vector Geometry." Sixty-page NSF sponsored curriculum text. Used on trial basis in some Chicago high schools. (Dr. Lashoff is a professor of mathematics, University of Chicago.)
- Fuson, K. C., & Hammond, B. (1972, April). "Mathematics Education: A Syllabus for Governors State University." An outline of knowledge and teaching competencies and means for elementary teacher trainees to achieve these competencies. Forty pages. (B. Hammond was a graduate student with me at University of Chicago.)
- Lesh, R., & Fuson, K. C. Northwestern's mathematics laboratory modules for elementary education, special education, and early childhood education majors. In the 1976-77 Resource Opportunity Book for the Big Ten/Big Eight Dean's Network.
- Fuson, K. C. (1985). Teacher lesson plans, student worksheets, and tests for teaching addition and subtraction by counting with finger patterns.
- Fuson, K. C. (1986). Teacher lesson plans, student worksheets, and tests for teaching the addition and subtraction multidigit algorithms with base-ten blocks.
- Fuson, K. C. (1986). Addition and subtraction word problem booklet, teacher introduction and overview.
- Fuson, K. C., Smith, S., Ron, P., Hudson, K., Hufferd-Ackles, K., & Lo Cicero, A. (1998). Children's Mathematical Thinking. Grade 1, Grade 2, Grade 3. Child and teacher curricular materials in English and in Spanish. Totally revised 1998.
- Fuson, K. C. (1999, 2000, 2001, 2002, 2003). Children's Math Worlds. Kindergarten and Grades 1, 2, 3, 4, 5. Student and teacher curricular materials in English and Kindergarten through Grade 3 student materials in Spanish. Most grades revised each year.
- Fuson, K. C. (2004, 2009, 2011, 2012, 2013, 2015 CA, 2018). Math Expressions. Full stand-alone Kindergarten through Grade 6 math program published by Houghton Mifflin Harcourt.

Fuson, K. C. (2018). Math Expressions Full prekindergarten math program called Math Expressions Early Learning Resources.

Papers Presented

Bell, M., Fuson, K., & Hammond, B. (1972, April). Using manipulatives to teach teacher trainers. Paper presented at the annual meeting of the National Council of Teachers of Mathematics, Chicago.

Fuson, K. C. (1974, March). Methodologies for evaluating the use of manipulatives in the teaching of mathematics to teachers. Paper presented at a research session of the National Council of Teachers of Mathematics Regional Meeting, Des Moines.

Fuson, K. (1974, November). Graphing as a tool. Paper presented at the Joint Illinois Science Teachers Association and School Science and Mathematics Association Convention, Chicago.

Fuson, K., & Wertsch, J. (1977, March). Proposals for investigating the development of goal-directed activity in children: Some preliminary data. Paper presented at Society for Research in Child Development, New Orleans.

Fuson, K. (1977, April). Difficulties our system of numeration causes children--and what you can do about it. Paper presented at the 55th Annual Meeting of the National Council of Teachers of Mathematics, Cincinnati.

Fuson, K. (1977, October). The learning of mathematics as goal-directed activity: A model with educational implication for young children. Paper presented at the Conference on Models in the Teaching and Learning of Mathematics, Durham, NH.

Fuson, K. (1977, November). Vygotskian theoretical constructs related to research in the development of early arithmetic concepts. Paper presented at Conference on Number and Measurement Concepts, Indianapolis.

Fuson, K. (1978, September). The counting string as a neutral tool for the construction of ordinal and cardinal number concepts. Invited paper presented at the Conference on Children's Mathematical Cognition, Pittsburgh.

Fuson, K. C. (1979, March). Developmental patterns in speech-for-self. Paper presented at the biennial meetings of the Society for Research in Child Development, San Francisco.

Fuson, K. C., & Zivin, G. (1979, March). Do they really talk to themselves? Recent naturalistic studies of the development of verbal self-regulation. Symposium organized and co-chaired at the biennial meetings of the Society for Research in Child Development, San Francisco.

Fuson, K. C. (1979, April). Developmental changes in the counting word string. Pre-session meeting of the International Research Group for Psychology and Mathematics Education, Boston.

Fuson, K. C. (1979, April). The importance of Vygotsky's "zone of proximal development" in teaching mathematics. Paper presented at the annual meeting of the National Council of Teachers of Mathematics, Boston.

- Fuson, K. C. (1979, September). A preliminary analysis of young children's counting. Paper presented at the annual meeting of the North American branch of the International Group for the Psychology of Mathematics Education, Evanston, IL.
- Fuson, K. C. (1979, October). The logical, mathematical and psychological structure of counting and early number. Invited paper presented at the Project Director's Meeting: National Science Foundation and National Institute of Education. Fredericksburg, VA.
- Fuson, K. C. (1979, November). Counting solution procedures in addition and subtraction. Invited paper presented at the International Wingspread Conference on the Initial Learning of Addition and Subtraction Skills, Racine, WI.
- Fuson, K. C., & Richards, J. (1980, April). Children's construction of the counting numbers: levels of number word production. Paper presented at the Annual Meeting of the American Educational Research Association, Boston.
- Fuson, K. C., & Mierkiewicz, D. (1980, April). A detailed analysis of counting. Paper presented at the Annual Meeting of the American Educational Research Association, Boston.
- Fuson, K. C., Secada, W., & Hall, J. W. (1980, April). Effects of counting and matching on conservation of number. Paper presented at the Annual Meeting of the American Educational Research Association, Boston.
- Fuson, K. C. (1980, April). Remarks on processes children use in solving addition and subtraction problems. Symposium critic response at the Symposium "Processes Children Use in Solving Addition and Subtraction Problems" presented at the Annual Meeting of the American Educational Research Association, Boston.
- Fuson, K. C., & Olszewski, P. (1980, April). Directive speech as a function of age, task, and presence/absence of a peer. Paper presented at the Annual Meeting of the American Educational Research Association, Boston.
- Fuson, K. C. (1980, August). The development of counting words and of the counting act. Invited paper presented at the Fourth International Congress on Mathematical Education, Berkeley, CA.
- Fuson, K. C. (1980, August). The counting word sequence as a representational tool. Paper presented at the Fourth International Conference for the Psychology of Mathematics Education, Berkeley, CA.
- Slaughter, D., Fuson, K. C., & Akerstrom, M. (1981, April). Developmental characteristics of maternal and child speech among lower income blacks in an early intervention study. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Boston.
- Dickson, P., & Fuson, K. C. (1981, April). Effects of age and culture on the decoding of referential messages encoded by adults and children. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Boston.
- Fuson, K., & Hall, J. W. (1981, April). A conceptual analysis of the development of early number words. Paper presented at the Biennial Meetings of the Society for Research in Child Development, Boston.

- Fuson, K. C. (1981, April). The role of units in the development of number. Invited paper presented at the Counting Types Symposium, Athens, GA.
- Fuson, K. C. (1981, April). Recent research on counting in addition and subtraction. Paper presented at the SIG/ME Research Pre-session, Annual Meeting of the National Council of Teachers of Mathematics, St. Louis, MO.
- Fuson, K. C., Secada, W. G., & Hall, J. W. (1982, March). Skills underlying counting-on in addition. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- Pergament, G. G., & Fuson, K. C. (1982, October). Effects of size of set, homogeneity of objects, and collection nouns on children's accurate counting and use of the cardinality rule. Paper presented at the Fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Athens, Georgia.
- Pergament, G., & Fuson, K. (1983, June). Collective nouns, cardinality, and accurate counting skills. Paper presented at the Annual Meeting of the Jean Piaget Society, Philadelphia.
- Fuson, K. C., & Hall, J. W. (1983, September). Early relations between counting and cardinality. Paper presented at the Fifth Annual Meeting of the International Group for the Psychology of Mathematics Education. North American Chapter, Montreal.
- Fuson, K. C., & Secada, W. G. (1983, September). The development of number word sequence skills. Paper presented at the Fifth Annual Meeting of the International Group for the Psychology of Mathematics Education. North American Chapter, Montreal.
- Fuson, K. C. (1984, March). From counting-all to more efficient solution procedures in addition. Paper presented at the National Council of Teachers of Mathematics Midwest Regional Conference, DeKalb, IL.
- Fuson, K. C., & Brinko, K. T. (1984, March). Microcomputers for drill and practice? Paper presented at the Eighth Annual Symposium of Phi Delta Kappa and Northwestern University School of Education, Evanston, IL. (Poster session given by Kathleen Brinko.)
- Fuson, K. C. (1984, April). Addition and subtraction: Children's concepts and instruction. Research symposium organized and chaired at the Research Pre-session to the 62nd Annual Meeting of the National Council of Teachers of Mathematics, San Francisco.
- Fuson, K. C. (1984, April). Recent research on teaching addition and subtraction. Paper presented at the Research Pre-session to the 62nd Annual Meeting of the National Council of Teachers of Mathematics, San Francisco.
- Fuson, K. C. (1984, April). Teaching addition: A developmental progression of children's solution procedures. Paper presented at the 62nd Annual Meeting of the National Council of Teachers of Mathematics, San Francisco.
- Fuson, K. C., & Hall, J. W. (1984, October). Introducing subtraction as counting up. Paper presented at the sixth annual meeting of the International Group for the Psychology of Mathematics Education, Madison, WI.

- Fuson, K. C. (1984, November). How is the cardinality rule learned? Paper presented at the Annual Meeting of the Psychonomic Society, San Antonio.
- Fuson, K. C. (1985, January). Some sources of individual differences in mathematics achievement. Invited paper presented at the Bush Program Conference on Explaining Performance Differences in Elementary School Mathematics, Ann Arbor, MI.
- Fuson, K. C. (1985, March). Teaching addition, subtraction, and place value concepts. Invited paper presented at the International Conference on Mathematics Education, Chicago.
- Fuson, K. C. (1985, April). Teaching an efficient method of addition. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Fuson, K. C. (1985, July). Teaching multi-digit addition and subtraction. Paper presented at the Ninth International Conference for the Psychology of Mathematics Education, Noordwijkerhout, The Netherlands.
- Hall, J. W., Fuson, K. C., & Willis, G. B. (1985, July). Teaching counting on for addition and counting up for subtraction. Paper presented at the Ninth International Conference for the Psychology of Mathematics Education, Noordwijkerhout, The Netherlands.
- Willis, G. B., & Fuson, K. C. (1985, October). Teaching representational schemes for the more difficult addition and subtraction verbal problems. Paper presented at the seventh annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Columbus, Ohio.
- Fuson, K. C. (1985, November). Roles of representation in learning multi-digit addition and subtraction. Paper presented at the annual meeting of the Psychonomics Society, Boston.
- Fuson, K. C. (1986, July). First and second graders; performance on compare and equalize word problems. Paper presented at the Tenth International Conference for the Psychology of Mathematics Education, London, England.
- Fuson, K. C. (1986, November). Effects of collection terms on class inclusion and on number tasks. Paper presented at the annual meeting of the Psychonomics Society, New Orleans.
- Fuson, K. C. (1987, April). Teaching the general multi-digit addition and subtraction algorithms to first and second graders. Paper presented at the biennial meeting of the Society for Research in Child Development, Baltimore.
- Fuson, K. C. (1988, May). Developmental relationships among sequence number words, counting correspondence, and cardinality. Paper presented at the annual meeting of the Midwest Psychological Society, Chicago.
- Fuson, K. C. (1988, November). First and second graders' ability to use schematic drawings in solving twelve kinds of addition and subtraction word problems. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, DeKalb, IL.

- Fuson, K. C. (1988, November). Second graders' use of schematic drawings to solve addition and subtraction word problems. Paper presented at the annual meeting of the Psychonomic Society, Chicago.
- Fuson, K. C. (1989, March). Do place-value concepts precede, accompany, or follow meaningful learning of multidigit addition and subtraction algorithms? Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Fuson, K. C. & Kwon, Y. (1989, April). English and Chinese number words: The cost to U.S. children of irregularities in the English system of number words. Paper presented at the Biennial Meetings of the Society for Research in Child Development, Kansas City.
- Fuson, K. C. & Kwon, Y. (1989, November). Effects on addition and subtraction of the named ten in Korean number words. Paper presented at the Annual Meeting of the Psychonomics Society, Atlanta.
- Fuson, K. C. (1991, April). Alternatives to teaching standard algorithms in school mathematics: Providing learning/teaching settings that support the construction of conceptual multiunit numbers. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Burghardt, B. H. & Fuson, K. C. (1991, April). Group interaction effects on children's invented multidigit addition procedures. Paper presented at the Research Council Pre-session to the Annual Meeting of the National Council of Teachers of Mathematics, New Orleans.
- Fuson, K. C. (1991, April). Children's invention of multidigit addition and subtraction methods. Papers presented at the Cognitive Development and Instruction Lectures, University of Edmonton.
- Fuson, K. C. (1991, May). Three developmental paths through addition and subtraction: Effects of number words and of finger methods for presenting addition and subtraction. Paper presented at the Annual Meeting of the Midwestern Psychological Association, Chicago.
- Fuson, K. C. & Burghardt, B. (1991, July). Group case studies of second graders inventing multidigit addition procedures for base-ten blocks and written marks. Paper presented at the Annual Meeting of the International Group for the Psychology of Mathematics Education, Assisi, Italy.
- Fuson, K. C. (1992, April). A theory about developmental levels in children's solutions of word problems. Paper presented at the Conference on Word Problem Solving, Max Planck Institute for Psychological Research, Munchen, Germany.
- Fuson, K. C. (1992, April). Developmental levels in children's addition and subtraction solution procedures. Paper presented at the Universite de Paris V (the Sorbonne), Paris, France.
- Fuson, K. C. (1992, April). Children's counting and early numerical thinking. Paper presented at the Centre Hospitalier Universitaire Bicetre, Paris, France.
- Fuson, K. C. (1992, April). Multidigit addition and subtraction thinking. Paper presented at the Universite de Paris 8, Paris, France.

- Fuson, K. C. (1992, June). Research frontiers in early mathematics learning. Paper presented at the Conference on French/American collaborative arithmetic research, Universite de Bourgogne, Dijon, France.
- Fuson, K. C. (1992, June). Linguistic and cultural aspects of children's numerical thinking. Paper presented at the Groupe Hospitalier Pitie-Salpetriere, Paris, France.
- Fuson, K. C. (1992, June). Children's invented multidigit addition methods. Paper presented in the Developmental Psychology Series, University of Oxford, Oxford, Great Britain.
- Fuson, K. C., & Perry, T. (1993, March). Hispanic children's addition methods: Cultural diversity in children's informal solution procedures. Paper presented at the Biennial Meeting of the Society for Research in Child Development, New Orleans, LA.
- Fuson, K. C., & Burghardt, B. H. (1993, April). Children's invented multidigit addition solutions and teacher support of problem solving and reflection. Paper presented at the Annual Meeting of the American Educational Research Association, Atlanta, GA.
- Fuson, K. C. (Symposium Chair and Critic) (1993, April). Comparing the conceptual growth of U.S. and Japanese students. Symposium presented at the Annual Meeting of the American Educational Research Association, Atlanta.
- Fraivillig, J. L., Fuson, K. C., & Thompson, P. W. (1993, August). Microworld support of children's understanding of multidigit addition. Paper presented at the World Conference on AI in Education, Edinburgh, Scotland.
- Fuson, K. C. (1993, September). Latino, Anglo, and Korean children's finger addition methods. Paper presented at the Annual Meeting of the European Association for Research on Learning and Instruction, Aix-En-Provence, France.
- Fuson, K. C., & Burghardt, B. H. (1993, October). Group case studies of second graders inventing multidigit addition procedures for base-ten blocks and written marks. Paper presented at the Annual Meeting of the Psychology of Mathematics Education -- North American Chapter, Asilomar, CA.
- Fuson, K. C. (1994, April). Children's use of schematic drawings to present problem situations. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Fuson, K. C., & Smith, S. (1994, April). Supporting Latino first graders' ten-structured thinking in urban classrooms. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Fuson, K. C., & Wearne, D. (1994, April). Designing classrooms for learning with understanding: The case of elementary mathematics: Representational context--conceptual and instructional supports. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Fuson, K. C. (1994, December). An analysis of learning difficulties in quantitative 2-digit subtraction. Paper presented at the interdisciplinary meeting Concepts of Number and Simple Arithmetic, Trieste, Italy.

- Fuson, K. C., Zecker, L. B., Lo Cicero, A. M., Ron, P. (1995, April). El Mercado in Latino primary classrooms: A fruitful narrative theme for the development of children's conceptual mathematics. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Diamond, A. & Fuson, K. C. (1995, April). Teacher questioning patterns in reform mathematics classrooms. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Drueck, J., Fuson, K. C., Carroll, W., & Bell, M. S. (1995, April). Performance of U.S. first graders in a reform math curriculum compared to Japanese, Chinese, and traditionally taught U.S. students. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Fuson, K. C. (1995, April). Contextualizing mathematics and bridging cultures: Supporting reform mathematics classrooms for Latino students. Symposium organized at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Fuson, K. C. (1995, April). Sources of Asian children's superiority in mathematics: Culture or classroom in this cohort? Symposium organized at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Fuson, K. C. (1996, March). Supporting in-depth understanding of word problems. Paper presented at the Sixth Annual Conference on Quality in Education, Chicago, IL.
- Fuson, K. C. (1996, April). Aspects of reform mathematics teaching in urban Latino classrooms. Symposium organized at the Annual Meeting of the American Educational Research Association, New York.
- Fuson, K. C. (1996, April). Progress in understanding reform mathematics teaching. Symposium organized at the Annual Meeting of the American Educational Research Association, New York, NY
- Fuson, K. C. (1996, April). Latino children's construction of arithmetic understanding in urban classrooms that support thinking. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- Fuson, K. C., Feingold, C., Cuevas, S. (1996, April). Children's Math Worlds: A teaching/learning project to support urban Latino children's construction of arithmetical understandings. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- Fuson, K. C., Smith, S. T., & Lo Cicero, A. (1996, July). A design framework for teaching/learning activities supporting Latino first graders' ten-structured thinking in urban classrooms. Paper presented at the International Conference on the Learning Sciences, Northwestern University, Evanston, IL.
- Fuson, K. C., Perry, T., & Ron, P. (1996, October). Developmental levels in culturally-different finger methods: Anglo and Latino children's finger methods of addition. Paper presented at

the 18th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Panama City, FL.

- Fuson, K. C., & Smith, S. T. (1996, December). Supporting multiple conceptual structures and calculation methods in the classroom: Issues of conceptual supports, instructional design, and language. Paper presented at the invited meeting on The role of contexts and models in the development of mathematical strategies and procedures, Leiden University, The Netherlands.
- Fuson, K. C. (1997, March). Children's Math Worlds: A teaching/learning project to support urban Latino children's construction of arithmetical understandings. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Fuson, K. C. (1997, March). Progress in understanding reform mathematics teaching and learning. Symposium organized at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Fuson, K. C. & Ding, D. (1997, March). Teacher questions in EM second-grade classes compared to teacher questions in Japanese, Taiwanese, and traditional U.S. classrooms. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Fuson, K. C., & Burghardt, B. H. (1997, October). Group case studies of second graders inventing multidigit subtraction methods. Paper presented at the Annual Meeting of the Psychology of Mathematics Education -- North American Chapter, Bloomington/Normal, IL.
- Secada, W. S., & Fuson, K. C. (1998, February). Research and practice on teaching mathematics with understanding to bilingual children. Paper presented at the Office of Bilingual Education and Minority Languages Affairs National Professional Development Institute, Dallas, TX.
- Fuson, K. C. (1998, April). Domain-specific models of mathematics teaching and learning developed in urban Latino classrooms. Symposium organized for the meeting of the American Educational Research Association, San Diego, CA.
- Fuson, K. C. (1998, April). The chalkboard activity structure as a facilitator of helping, understanding, discussion, and reflection. In S. McGee (Symposium Organizer), Changing the game: Activity structures for reforming education. Symposium paper presented at the meeting of the American Educational Research Association, San Diego, CA.
- Fuson, K. C., Ron, P., & Perry, T. (1998, April). Progressions of developmental levels in culturally-different finger methods: Finger addition and subtraction models of Anglo and Latino children. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.
- Fuson, K. C., Sherin, B., & Smith, S. T. (1998, October). A Vygotskian action-research model for developing and assessing conceptual models and instructional materials inter-actively. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Raleigh, NC.
- Fuson, K. C., & De La Cruz, Y. (1999, April). A Mathematics Equity Pedagogy in action in urban classrooms. Paper presented at the annual meeting of the American Educational Research Association, Montreal, CA.

- Fuson, K. C. (1999, October). Balancing the needs for skill and for understanding in elementary mathematics curricula. Paper presented at the Hegeler Institute Conference to End the Math Wars, Lasalle, IL.
- Fuson, K. C. (2000, April). Perspectives on prekindergarten through grade 2 standards in number and operation. Paper presented at the Research Presession of the National Council of Teachers of Mathematics, Chicago, IL.
- Fuson, K. C. (2000, April). Research perspectives on curriculum development. Paper presented in a symposium at the Research Presession of the National Council of Teachers of Mathematics, Chicago, IL.
- Fuson, K. C. (2000, April). Issues in reform math and computation in the early grades. Paper presented in a symposium at the annual meeting of the National Council of Teachers of Mathematics, Chicago, IL.
- Smith, S. S., Sherin, B. & Fuson, K. C. (2000, April). From relational description to algebraic generalization in the multiplicative domain. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Fuson, K. C. (2000, May). Goals and standards for prekindergarten through grade 2: Mastery by all in numbers and operations. Paper presented at the Conference on Standards for Preschool and Kindergarten Mathematics Education, Washington, DC.
- Duncan, A., Lee, H., & Fuson, K. C. (2000, October). Pathways to early number concepts: Use of 5- and 10-structured representations in Japan, Taiwan, and the United States. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Tucson, AZ.
- Fuson, K. C. & Lo Cicero, A. M. (2000, October). El Mercado in Latino primary math classrooms. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Tucson, AZ.
- Izsák, A. & Fuson, K. C. (2000, October). Students' understanding and use of multiple representations while learning two-digit multiplication. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Tucson, AZ.
- Fuson, K. C., Duncan, A., & Lee, Hsiu-fei (2001, April). Authoritative teaching in Japan, Taiwan, and the United States: Emotional and conceptual supports in the mathematics classroom. Paper presented at the annual meeting of the Society for Research in Child Development, Minneapolis, MN.
- Fuson, K. (2001). Toward a coherent network of learning goals for prekindergarten to grade 5. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Snowbird, UT.
- Kalchman, M. & Fuson, K. (2001). Conceptual understanding of functions: A tale of two schemas. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Snowbird, UT.

- Murata, A. & Fuson, K. (2001, October). Learning paths to 5- and 10-structured understanding of quantity: Addition and subtraction solution strategies of Japanese children. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Snowbird, UT.
- Fuson, K. C. & Kalchman, M. (2002, April). Bridging the addition-multiplication learning gap: Teaching studies in four multiplicative domains. Symposium presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Fuson, K. C. & Kalchman, M. (2002, April). Using an additive linear model to explain any multiplication of a fraction by a fraction. Paper presented in a symposium at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Fuson, K. and Kalchman, M. (2002, October). A length model of fractions puts multiplication of fractions in the learning zone of fifth graders. Paper presented at the twenty-fourth annual meeting of North American chapter of the International Group of the Psychology of Mathematics Education.
- Murata, A. and Fuson, K. C. (2002, October). Seeing U.S. reform teaching in a Japanese classroom: Mutual adaptations in first graders' learning teens additions. Paper presented at the twenty-fourth annual meeting of North American chapter of the International Group of the Psychology of Mathematics Education.
- Kalchman, M. & Fuson, K. C. (2004, April). Re-viewing conceptual and procedural learning. Paper presented the Annual Meeting of the American Educational Research Association, San Diego, CA.
- Fuson, K. C. (2006, April). Meanings of numerical operations through word problem solving: Access to all through student situational drawings within an algebraic approach. Paper presented at the annual meeting of the National Council of Supervisors of Mathematics, St. Louis, MO.
- Fuson, K. C. (2006, April). An algebraic approach to word problem solving for all learners using ambitious problems, drawings, and Math Talk. Paper presented at the annual meeting of the National Council of Supervisors of Mathematics, St. Louis, MO.
- Fuson, K. C. (2006, April). Supporting mathematical talk with students' drawings and accessible algorithms. Paper presented at the annual meeting of the National Council of Teachers of Mathematics, St. Louis, MO.
- Fuson, K. C., Pecci, J., Roedel, S., & Atler, T. (2006, September). Math Talk using proof drawings: Teachers share their experiences. Paper presented at a regional meeting of the National Council of Teachers of Mathematics, Chicago, IL.
- Fuson, K. C. (2006, October). Teaching word problems algebraically and for English Language Learners. Paper presented at a regional meeting of the National Council of Teachers of Mathematics, Phoenix, AZ.

- Fuson, K. C. (2007, March). Research-based accessible algorithms create success for all. Paper presented at the annual conference of the Association for Supervision and Curriculum Development (ASCD), Anaheim, CA.
- Fuson, K. C. (2007, March). Integrating NRC Principles and NCTM Process Standards in a Class Learning Path Model to individualize within whole-class activities. Paper presented at the annual meeting of the National Council of Supervisors of Mathematics, Atlanta, GA
- Fuson, K. C. (2008, March). *Differentiating within whole-class activities to meet the NCTM and California standards*. Paper presented at the Los Angeles City Teachers' Mathematics Conference, Los Angeles, CA.
- Fuson, K. C. (2008, November). *Learning paths to computational understanding and fluency*. Paper presented at the Conference of the California Math Council South, Palm Springs, CA.
- Fuson, K. C. (2008, April). *Math Expressions: A Learning Path Program*. Paper presented at the Luncheon for the Association of State Supervisors of Mathematics, Salt Lake City, UT.
- Fuson, K. C. (2008, April). *Differentiating fractions and ratios and teaching both coherently and with understanding*. Paper given at the Annual Conference of the National Council of Supervisors of Mathematics, Salt Lake City, UT.
- Fuson, K. C. (2008, April). *Tweaks of the Curriculum Focal Points: Toward Even More Balance and Coherence*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Salt Lake City, UT.
- Fuson, K., Beckman, S., Clements, D. & Ginsburg, H. (2009, April). *Report of the NRC's Committee on Early Childhood Math: Helping All Students Get Off to a Good Start in Math*. Paper given at the Annual Conference of the National Council of Supervisors of Mathematics, Washington, DC.
- Fuson, K. C. (2009, April). *Helping U.S. disadvantaged kindergarten children understand place value like East Asian children*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Washington, DC.
- Clements, D., Fuson, K., Beckman, S., & Ginsburg, H. (2009, April). *Report of the NRC's Committee on Early Childhood Math: Helping All Students Get Off to a Good Start in Math*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Washington, DC.
- Beckman, Sybilla & Fuson, K. (2009, April). *Focus in Grade 5: Teaching with Curriculum Focal Points*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Washington, DC.
- Clements, D., Fuson, K., Beckman, S., & Ginsburg, H. (2010, April). *Report of the NRC's Committee on Early Childhood Math*. Paper given at the Annual Conference of the National Council of Supervisors of Mathematics, San Diego, CA.

- Clements, D., Fuson, K., Beckman, S., & Ginsburg, H. (2010, April). *Report of the NRC's Committee on Early Childhood Math*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, San Diego, CA.
- Fuson, K. C. (2010, April). *Kindergarten and first graders from poverty schools can achieve like East Asian children and older U.S. children*. Paper given at the Annual Conference of the National Council of Supervisors of Mathematics, San Diego, CA.
- Fuson, K. C. (2010, April). *Modeling and relating fractions and ratios within the multiplication table*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, San Diego, CA.
- Fuson, K. C. (2010, October). *The Power of Math Drawings in Supporting Student Math Talk*. Paper given at the Regional Conference of the National Council of Teachers of Mathematics, Denver, CO.
- Fuson, K. C. & Kuske, L. (2011, April). *Implementing the National Research Council (NRC) Early Childhood Mathematics Goals by Integrating Within and Across Number and Geometry Goals*. Paper given at the Annual Conference of the National Council of Supervisors of Mathematics, Indianapolis, IN.
- Beckmann, S. & Fuson, K. C. (2011, April). *Teaching Area in the Common Core through Decomposing and Composing*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Indianapolis, IN.
- Kuske, L. & Fuson, K. C. (2011, April). *See the Math Number and Geometry: NRC's Foundation for Early Childhood Math Programs*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Indianapolis, IN.
- Fuson, K. C. & Murata, A. (2012, April) *The Class Learning Path Model as a Lens for Understanding Successful Math Programs*. Paper given at the Research Pre-session of the Annual Conference of the National Council of Teachers of Mathematics, Philadelphia, PA.
- Fuson, K. C. & Beckmann, S. (2012, April). *Multiplication to Ratio, Proportion, and Fractions within the Common Core*. Paper presented at the annual meeting of the National Council of Teachers of Mathematics, Philadelphia, PA.
- Fuson, K. C. (2012, October). *The Early Development of Numerical Concepts*. Paper presented as a featured talk in the Department of Education, Rome University 3, Rome, Italy.
- Fuson, K. C. (2012, October). *Ratio, Proportion, and Fractions*. Paper presented as a featured talk in the Department of Mathematics, Rome University 3, Rome, Italy.
- Fuson, K.C. & Beckmann, S. (2013, April). *Teaching Phases and Standard Algorithms in the Common Core*. Presented at the Annual Conference of the Association of State Supervisors of Mathematics, Denver, CO.
- Fuson, K.C. & Beckmann, S. (2013, April). *From Strategies to Variations in the Standard Algorithms*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, Denver, CO.

- Fuson, K.C. (2013, April). *Continual Formative Assessment Using the Common Core Mathematical Practices*. Presented at the Annual Conference of the National Council of Teachers of Mathematics, Denver, CO.
- Fuson, K.C. (2014, April). *The CCSS OA Learning Progression: Coherent Visual Models that Support Problem Solving and the Mathematical Practices*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, New Orleans, LA.
- Fuson, K.C. & Beckmann, S. (2014, April). *Using Math Drawings and Math Talk for Understanding Algorithms*. Presented at the Annual Conference of the National Council of Teachers of Mathematics, New Orleans, LA.
- Beckmann, S. & Fuson, K.C. (2014, April). *Meaningful approaches to algorithms for decimals*. Presented at the Annual Conference of the National Council of Teachers of Mathematics, New Orleans, LA.
- Fuson, K.C. (2014, October). *Using CCSS OA problems to implement the mathematical practices*. Presented at the Annual Conference of the California Math Council-South, Palm Springs, CA.
- Fuson, K.C. (2015, April). *Research-Based Learning Progressions in the K-6 CCSS and the Mathematical Practices*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, Boston, MA.
- Fuson, K.C. (2015, April). *Tasks That Support Problem Solving, Reasoning, and CCSS Mathematical Practices*. Presented at the Annual Conference of the National Council of Teachers of Mathematics, Boston, MA.
- Fuson, K.C. (2015, November). *Building a Nurturing Math Talk Teaching-Learning Community*. Presented at the Annual Conference of the California Math Council-South, Palm Springs, CA.
- Fuson, K.C. (2016, April). *Supporting the CCSSM NF Learning Progression and Avoiding Errors by Using the Standards for Mathematical Practice (SMP)*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, Oakland, CA.
- Fuson, K.C. (2016, April). *Children Living in Poverty Can Solve CCSS OA Word Problems*. Presented at the Annual Conference of the National Council of Teachers of Mathematics, San Francisco, CA.
- Clements, D. H., Sarama, J., & Fuson, K.C. (2016, April). *The Common Core in Early Math and Developmental Appropriateness*. Presented at the Annual Conference of the National Council of Teachers of Mathematics, San Francisco, CA.
- Fuson, K.C. (2017, April). *Kindergarten and grade 1 children living in poverty can learn the CCSS NBT concepts*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, San Antonio, TX.
- Fuson, K.C. & Decker, R. S. (2017, April). *Learning cycles and mathematical practices in the classroom math talk community*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, San Antonio, TX.

- Grandau, L., Fuson, K. C., & Johnson, D. (2017, April). *Supporting teachers to systematically analyze students' strengths and struggles and identify next moves*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, San Antonio, TX.
- Fuson, K. C. (2017, September). *Relating math words, visual images, and math symbols for understanding and competence*. Presented at the conference Trisomy 21, Mathematics, and Thought, Department of Mathematics, Zaragoza, Spain.
- Fuson, K.C. (2018, April). *Connecting Geometric Measurement, Other Measures, and Data Use Standards to Each Other and to Standards in Other CCSS Domains*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, Washington, DC.
- Fuson, K.C. (2018, April). *Student drawings of length models can support understanding of fraction computation*. Paper given at the Research Pre-session of the Annual Conference of the National Council of Teachers of Mathematics, Washington, DC.
- Fuson, K.C. (2018, April). *Relating Fractions, Measurement, and Data with Meaningful Number Lines*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, Washington, DC.
- Fuson, K.C. (2019, April). *Deepening and Connecting Geometry, Geometric Measurement, and Operations and Algebraic Thinking (OA) Within and Across the Grades*. Presented at the Annual Conference of the National Council of Supervisors of Mathematics, San Diego, CA.
- Fuson, K.C. (2019, April). *Relating Number and Geometry in the Early Grades*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, San Diego, CA.
- Fuson, K.C. (2019, April). *PK Early Math Learning: Preparing All Children for Kindergarten Success*. Paper given at the Annual Conference of the National Council of Teachers of Mathematics, San Diego, CA.
- Fuson, K.C. (2020, April). *Relating Decimals, Fractions, and Ratios for Deeper Understanding: How Are They Alike and How Are They Different?* Presented at the Annual Conference of the National Council of Supervisors of Mathematics, Chicago, IL.
- Fuson, K.C. (2021, March). *Balanced Learning Path Teaching in the Classroom and Remotely*. Presented at the Department of Mathematics, UCLA, Los Angeles.
- Fuson, K.C. (2021, April). *Relating the NCTM Mathematics Teaching Practices to Support Learning Difficult Math Topics*. Presented at the Virtual Annual Conference of the National Council of Teachers of Mathematics.
- Fuson, K.C. (2022, March). *Teaching the Best Computation Methods*. Presented at the Department of Mathematics, UCLA, Los Angeles.
- Fuson, K.C. (2023, February). *Building a nurturing Math Talk Community*. Presented at the Nebraska Association for Teachers of Mathematics PPEC (Pre-Professionals/Early Career) Conference.

Conference Discussion or Working Groups Led

De La Cruz, Y., Fuson, K. C., Licón Khisty, L., Masingila, J., Moschkovich, J., & Brenner, B. (1997, October). Discussion Group 4: Applying socio-cultural theories to research in mathematics education. Two-session discussion group conducted at the Annual Meeting of the of the International Group for the Psychology of Mathematics Education - North American Chapter, Bloomington/Normal, IL.

Moschkovich, J., & Fuson, K. (1998). Using socio-cultural theories in mathematics education research. Three-session working group conducted at the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Raleigh, NC.

Professional Service

Chair of the Editorial Board, Journal for Research in Mathematics Education, 1983-84.

Editorial Board Member, 1981-1984. Journal for Research in Mathematics Education.

Editorial Board Member, 1985-1991. Journal of Experimental Child Psychology.

Editorial Board Member. Mathematical Cognition, Mathematical Thinking and Learning.

Contributing Editor of The Journal of Mathematical Behavior, 1980-present.

Reviewer for Journal for Research in Mathematics Education, Child Development, Developmental Psychology, Journal of Educational Psychology, Cognition and Instruction, Mathematical Cognition, Merrill-Palmer Quarterly, Journal of Experimental Child Psychology, British Journal of Developmental Psychology, Contemporary Psychology, Cognitive Therapy and Research, and occasional other journals.

Proposal reviewer for National Science Foundation, 1978-present.

Consultant to Sesame Street, 1986-1989.

Review writer for Investigations in Mathematics Education, 1975-1988.

Reviewer of paper proposals for AERA, SRCD, PME, and PME-NA conferences.

Illinois Council of Teachers of Mathematics Max Beberman Award Committee, 1980-81.

Research White Paper on Number and Computation, NCTM, National Standards Project, 1998-2001.

Teaching demonstration at the National Research Council, National Academy of Sciences Conference on Learning Research and Educational Practice, Washington, DC, 1998.

Extensive feedback on the NCTM Standards 2000 draft.

National Academy of Sciences National Research Council Committee: Mathematics Learning Study, 1999-2001.

Core committee on developing goals and standards for preschool and kindergarten mathematics education, 2000-2001.

Teaching Experience

1966-1969 Certified teacher in mathematics, Parker High School (Chicago Public Schools), 6800 South Stewart; Essentials (remedial mathematics), Geometry, and an accelerated college preparatory program (federally funded).

1970-1975 The University of Chicago, Chicago, Illinois
 Department of Mathematics
 Mathematics 101: Sets and Logic
 Department of Education
 Education 507: Learning and Teaching Basic Mathematics with Manipulative Materials

1972-1975 Roosevelt University, Chicago, Illinois
 Department of Mathematics
 Mathematics 266: Mathematics for Elementary School Teachers
 School of Education
 Education 261: Teaching of Mathematics in the Primary Grades
 Education 243: Mathematics, Science, and Social Concepts for Children Age 0-6

1975-present Northwestern University, Evanston, Illinois
 School of Education and Social Policy
 A70-1 Topics in Mathematics for Teachers
 C01-1 Child Development
 C26-1 Mathematics in the Elementary School from an Advanced Standpoint
 C38-1 The Teaching of Mathematics in the Secondary School
 C89-1 Young Children's Cognitive Development
 C76-1 Arithmetic in the Elementary School
 D03-1 Child and Adolescent Development & Learning
 D13-1 Theories of Human Development
 D20-2 Attachment and Parenting in Early Childhood
 D25-2 Learning and Development
 D51-1 Research in Mathematics Teaching and Learning
 D88-1 Popular Theories of Parenting
 D89-1 Cognitive Development
 E88-1 Seminar in Child Development (different seminars given)

University Service

University Faculty Planning Committee

University Appeals Board

University Curriculum Committee

University Committee on International Curriculum

Language and Cognition Administrative Committee (multiple years)

Liason to Institute for the Learning Sciences

School of Education and Social Policy Executive Committee, Chair and Member (multiple terms)

School of Education and Social Policy Search Committees (multiple terms)

Co-chair: Intellectual Development, Learning, and Instruction, SESP Graduate Program Area

School of Education and Social Policy: Chair, Undergraduate Committee (multiple terms)

School of Education and Social Policy: Faculty Personnel Review Committee (multiple terms)

School of Education and Social Policy: Dean's Search Committee

School of Education and Social Policy: Tenure and renewal committees, chair or member (multiple service)