## 7410 E. Norwood St.

Mesa, AZ 85207

Home: 480-307-6869

Cell: 480-273-7951

email: mcavanagh5@cox.net

PRIME Center

Arizona State University

Discovery Hall, Suite 212

PO Box 875703-5703

Work: 480-727-0907

email: mcavanagh@asu.edu

## EDUCATION

Ph.D. 2016 Mary Lou Fulton Teachers College, Arizona State University

 Curriculum and Instruction

 Dissertation: Young Children’s Algebraic Reasoning Abilities.

<http://search.proquest.com/docview/1845324019>

M.Ed. 1991 San Diego State University

 Education Administration.

Other Graduate Work

140 units – UCLA, Pepperdine University, California State University Long Beach: Science and mathematics content and pedagogy, computers, reading/language arts.

B.A. 1969 University of Northern Colorado

 Double Major: Arts and Sciences and Elementary Education.

 Minor: English.

**Credentials**:

1971-Life California Standard Elementary K-9, Life

2007 California Teacher of English Learners (CTEL) Certified

 California Education Administration K-12 (not active).

**PROFESSIONAL EXPERIENCE**

**Current Administrative Experience**

2008-present **Executive Director** of Center for Practice, Research and Innovation in Mathematics Education (PRIME Center); Arizona State University.

 Brings together various stakeholders to explore new and innovative approaches to improve success in mathematics education. Representative activities include:
1) Update teachers on mathematics content and other STEM topics, instructional methods, and strategies for communicating with teachers, parents and administrators;
2) Publish books and games for students, journals for teachers, and monthly *MATHgazines* for middle and high school students and the general population;
3) Facilitate the development of student/faculty research;
4) Support community efforts to stimulate enthusiasm for STEM such as the annual Basis School Ahwatukee, Spring Science Fairs, January 2015, 2016, and 2017, Phoenix, AZ. We develop and lead games, e.g., ***S****cience,* ***M****ath,* ***A****rt,* ***S****ports and* ***H****istory (SMASH) Jeopardy*.

2015-2018 **Director.** APP Maker Pro (AMP): Motivating STEM Study and Teacher Updating through App Development, NSF- DRL-ITEST. $1,199,910.

 The AMP Project is designed to increase high school student interest in STEM fields, and to update high school STEM teachers in their own and sister fields, by engaging in the process of analyzing existing apps and then developing apps to target problems in those fields. Works in all aspects of the project: recruitment of leaders, students and teachers, budget, implementation and evaluation.

##### Previous Administrative Experience

##### 2013-2018 Assistant Education Director, NSF- ASU Biology with X-ray Free Electron Lasers (BioXFEL), a Science and Technology Center (STC) Project. BioXFEL involves 8 colleges/universities, NSF, $6,125,001.

##### As the ASU education outreach component of BioXFEL, we conducted the Scientific Village Education Program, working in the recruitment of scientists to develop and implement specific program activities. High school juniors and seniors and undergraduate university students engaged in research activities in the working labs of ASU scientists, who are co-PIs of BioXFEL. We recruited students, coordinated the implementation of the project, and developed two films: 1) for recruitment and 2) a program update.

2011-2014 **Director**, STEM in the Middle, funded by Helios Education Foundation, $824,000.

We worked with Grades 5-8 teachers and students: 1) Middle School Teachers: Updated teachers content knowledge and teaching strategies in mathematics and science. Enhanced teachers’ leadership skills to enable them to conduct professional development in their schools and districts. 2) Middle School Students: Increased students’ content knowledge, problem solving and critical thinking skills in science, technology, engineering, and mathematics.

2008-2013 **Director**, *Prime the Pipeline, Putting Knowledge to Work (P3)*, funded by National Science Foundation, ITEST, $1,344,438.

We worked with ASU and other college faculty and business and industry partners to co-develop and present integrated projects to engage high school students and teachers in East Valley school districts. They were active members of scientific villages during after school sessions and summer institutes. The project was designed to increase the number of high school students interested in STEM disciplines and entering STEM careers. The inclusion of teachers helped sustain the goals of the project for new generations of students beyond the funding cycle.

2013-2015 **Logistics Coordinator**. NSF *CyberQUEST,* Cal State-San Marcos. $6,000.

*CyberQUEST* is designed to update middle school teachers in the sciences through the production of web-based science lessons. We were selected to partner with CSUSM to make all local arrangements including using our STEM network to recruit Arizona middle-school science teachers for training.

**Other Grant Activities**

2006-2008 **Director and Grant Writer**, *Getting Ready for Algebra*, San Diego County Office of Education, funded by California Math Science Partnership Grant $985,000.

Professional development program, offered a hybrid course of face-to-face and online professional development for all middle school mathematics teachers in San Diego County.

**Principal Investigator, Curriculum Developer, Grant Writer, and Coordinator** of *Math, Science, and Beyond* grantswhile employed by:

* + - * Solana Beach School District, 1990-2002
			* San Diego County Office of Education, 2002-2008

1996- 2001 **Principal Investigator,** *Math, Science, and Beyond*, funded by National Science Foundation ISE Division Award # 9627266 $1,274,622.

 Organized and conducted institutes for over 3,000 classroom teachers, university student-teachers, master-teachers, and paraprofessionals. Over 85% of the educators work with populations underrepresented in math and science. Math, Science, and Beyond is in over 2200 schools.

2001-2004 **Principal Investigator**, *6 to 6 and Beyond*, Improving Teacher Quality State Grants Program under No Child Left Behind Act, $732,434 funded by California Postsecondary Education Commission (CPEC), plus $118,000 funded by City of San Diego.

1994-1996 **Principal Investigator,** *Math, Science, and Beyond*, funded by CPEC, $794,966.

1992-1995 **Principal Investigator**, *Matemáticas y Ciencias sin Limites* funded by CPEC, $669,744.

1990-1994 **Coordinator, Curriculum Developer, and Leader of Pilot Studies**, *Math, Science, and Beyond*, funded by U.S. Department of Education, Fund for the Reform of Schools and Teaching (FIRST) $549,037.

**PROFESSIONAL DEVELOPMENT EXPERIENCE**

### University Instructor

1993-2004 California State University at San Marcos

 Science Education, K-6 (3 units per semester)
Mathematics Education, K-6 (3 units per semester).

1974-1979 University of Northern Colorado
Mathematics Content and Pedagogy, K-6 (4 units per quarter).

1972-1974 Pepperdine University
Mathematics Education, K-6 (3 units per semester).

1974 California State University at Northridge
Metric Measurement (3 units). I incorporated the Emmy Award winning TV series, *Metrify or Petrify,* into the curriculum. In the series, I played the role of teacher with my gifted students from Woodcrest Elementary School in South Central Los Angeles, California. Designed the PD model that was used by instructors throughout Los Angeles Unified School District.

**Other Professional Development Experience**

2005-2007 **Instructor** for California Assembly Bill (AB) 466 and Senate Bill (SB) 472. Conducted professional development on mathematics content knowledge, instructional strategies, and effective uses of state adopted instructional materials in mathematics in support of California Mathematics Framework; San Diego County Office of Education. 60 hour sessions over period of 2 weeks each summer.

2002-2004 **Consultant/reviewer Nation****al** Geographic Society School Publishing Division, for *Reading Expeditions: Math Behind the Science* Series of 8 Grades 3-8 math/science books product development consultant. Worked on all phases of development for their *Windows on Literacy* Series K-3 leveled reading series of 96 math books, Winner of 2006 [Teachers’ Choice Awards for the Classroom](http://www.theeducationcenter.com/cgi-bin/tec/page.jsp?NAME=lrn_tca_class_home&log=lrnlog&BV_SessionID=@@@@0062082030.1210105933@@@@&BV_EngineID=kadeclljljkibfekcglcfmcgmg.0), Learning Magazine.

1989-1990 **Administrative intern**, Richland Elementary School, San Marcos, CA. Led on-going professional development for new teachers and student teachers, participated in on-going evaluations of staff, wrote Program Quality Review Summaries,.

1981-1988 **Author/Senior Math/Science Consultant.** D.C. Heath. Conducted Kindergarten–8th grade mathematics professional development sessions for schools and school districts in the western and northwestern states and trained consultants throughout the USA.

1987-1988 **Professional Development Leader.** Department of Defense Dependent Schools (DoDDS), Conducted daily 6-hour mathematics professional development sessions on U.S. bases in southern Germany and in Okinawa, Japan.

1979-1981 **Independent Curriculum Developer** and Mathematics Consultant.

1974-1979 **General Manager and Vice-President**, Scott Resources, Inc., educational publishing company, specializing in mathematics and science curriculum. Responsible for personnel, product development, national marketing, and more than $5,000,000 annual budget,.

1969-1974 **Classroom teacher, K-6. Title 1 Mathematics Specialist.** Los Angeles Unified School District, Woodcrest Elementary School in South Central Los Angeles. Taught Grades K-6. Established and maintained two creative, highly publicized Mathematics Lab programs for 1700 K-6 students. Led staff of 70 teachers and 40 aides in the implementation of mathematics program. Conducted weekly classes for staff and evening classes for parents.

1968-1969 **Fourth Grade Teacher** (all subjects), Ernest Horn Elementary School, Greely, Colorado.

**CONFERENCE PRESENTATIONS**

**Recent Presentations**

2016

* M. Cavanagh. National Council of Teachers of Mathematics, Regional Conference, Phoenix, AZ, October, 2016. *Pattern and Function Work Builds Stronger Mathematical Thinking Skills*, Pre-Kindergarten - Grade 3.
* M. Cavanagh & C. Greenes, 21st Century STEM: Integrate 2 Innovate Conference, January 22, 2016, Phoenix, AZ. *Implementing STEM Programs that Capture and Nurture Imaginations and Talents,* Grades 5-12.
* Mary Cavanagh & Carole Greenes, National Council of Teachers of Mathematics, San Francisco, CA, April 2016*. High on a Hill: Visualization, Spatial Reasoning, and Geometric Modeling,* Pre-Kindergarten - Grade 2.

2015

* M. Cavanagh, National Council of Teachers of Mathematics, Annual Conference, Boston, MA. April, 2015. *Build Productive Mathematical Thinkers*, Pre-Kindergarten - Grade 3.

2014

* M. Cavanagh, Association of Arizona Teachers of Mathematics, Mesa, AZ, September, 2014. (“*Build Competent and Confident Young Learners,* Grades 1-2.
* M. Cavanagh, California Mathematics Council, Southern Section (CMC) Fall Conference Palm Springs, CA. October, 2014*. Build Productive Mathematical Thinkers,* Grades 1 - 2***.***
* M. Cavanagh, National Council of Teachers of Mathematics, Annual Conference, New Orleans, LA. April, 2014. *Build Productive Mathematical Thinkers*. Pre-Kindergarten - Grade 2*.*
* C. Greenes, C. Findell, S. Norton-Scott, **M. Cavanagh,** et al. performed in the AATM Choir. Arizona Association of Teachers of Mathematics, Fall Conference, Tempe, AZ, September 20, 2014 *One if By Land, Two if By Sea, Math in Our Nation’s History: A Mathamusical Adventure.*

2013

* M. Cavanagh, National Council of Teachers of Mathematics, Annual Conference, April, 2013. *Balancing at a Mile High: Build Productive Mathematical Thinkers.*
* C. Greenes and **M. Cavanagh**, National Council of Supervisors of Mathematics, Annual Conference, Denver, CO, April 2013. *Assessing and Developing Algebraic Thinking and Reasoning Methods.*
* M. Cavanagh, Association of Arizona Teachers of Mathematics, Mesa, AZ, September, 2013. *It’s All in the Balance Grades 1-2.*

2012

* M. Cavanagh, National Council of Teachers of Mathematics, Hartford, CT, October 2012. *Algebraic Reasoning: Inspire Your Students to Become Great Thinkers,*
Grades K-2.
* M. Cavanagh, Association of Arizona Teachers of Mathematics, Mesa, AZ, September, 2013, *Core of Operations and Algebraic Thinking CCAZ.*
* M. Cavanagh, Arizona Center for Afterschool Excellence, November, 2012, *STEM in the Middle, Motivating Science and Math Activities*.

2011

* C. Greenes & **M. Cavanagh,** National Science Teachers Association, San Francisco, CA, March, 2011. *Prime the Pipeline Project: Putting Knowledge to Work.*

2010

* M. Cavanagh, National Council of Teachers of Mathematics, Denver, CO, October 2010, *Strengthen Mathematics Vocabulary Using Popular Games: Connecting Concepts With Words.*
* M. Cavanagh, National Council of Teachers of Mathematics, Annual Conference, San Diego, CA, April, 2010, *Strengthen Mathematics Vocabulary Using Popular Games*. Included performers from National Comedy Theater.
* C. Greenes, **M. Cavanagh,** J. Zehring. National Council of Supervisors of Mathematics, San Diego, CA, April, 2010. *PRIME the Pipeline Project: Updating Teachers and Preparing STEM Students.*

2008

* M. Cavanagh, Arizona State University Teachers Conference, Polytechnic campus, July, 2008, *Word Play: Vocabulary Games and Activities to Enhance Academic Success in Math and Science Grades 3-8.*

**Earlier Conference Presentations**

1974-present National Council of Teachers of Mathematics, national and regional meetings

1992-2007 California Science Teachers Association

1974-2010 California Mathematics Council

1992-2007 San Diego Science Educators' Association

1992-present National Council of Supervisors of Mathematics

1977-2010 State Education Association: New Jersey, New York, Texas, South Carolina, Florida, Oregon, Maryland, California, Colorado, Wyoming, Arizona, New Mexico, Indiana, Minnesota. Duke University Mathematics Leadership Conferences

1977-2010 Greater San Diego Math Council

1988-1992 Orange County Math Teachers' Association

1982-1988 Oregon Council of Teachers of Mathematics

**PROFESSIONAL ORGANIZATIONS**

2008-present Arizona Association of Teachers of Mathematics (AATM). **Editorial Board for *OnCore Journal***, 2012-present, member and speaker.

2001-2003 National Council of Supervisors of Mathematics (NCSM) **Nominations & Elections Chair**

2002-2005 National Council of Supervisors of Mathematics (NCSM)**Advertising Chair**

2004 National Council of Supervisors of Mathematics (NCSM) **Monograph author**

1994 National Council of Supervisors of Mathematics (NCSM) **Task Force on Effecting Change, Reporter.**

1974-present National Council of Teachers of Mathematics (NCTM), **member and speaker.**

1990 – 2014 National Science Teachers Association (NSTA), **member and speaker.**

1990-2007 California Science Teachers Association (CSTA) **member and speaker**.

1990-2007 San Diego Science Educators' Association (SDSEA), **member and speaker**.

1997-2008 Greater San Diego Math Council (GSDMC). **member and speaker**.

## AWARDS

2012 Award of Excellence for Outstanding Afterschool Program, PRIME Center won. Arizona Center for Afterschool Excellence

2010 Award of Excellence for Outstanding Afterschool Program, PRIME Center was 1 of 3 finalists. Arizona Center for Afterschool Excellence

2000 First Place Award of Excellence for The State of California Recreation and Community Service Program

1999 California PTA’s Golden Bell Award Solana Highlands Dad’s Club received for its MSB program

1995 *Promising Practices in Mathematics and Science Education,* published by the U.S. Department of Education,

1986, 1990 Educational Foundation Name Grant Awardee, American Association of University Women (AAUW)

1983, 1984 Outstanding Marketing, D.C. Heath, Heath Mathematics K-8 Program

1974-1978 Emmy Award winning T.V. series, *Metrify or Petrify,* produced by Children's Television Workshop

**PUBLICATIONS**

**Books**

**1.** Greenes, C., **Cavanagh, M.**, *MATHadazzles, Mind stretch puzzles*, A series of number puzzle books to develop logical reasoning and number sense. Tempe, AZ: Arizona State University:

1. Volume 1: Reasoning with Numbers (2016)
2. Volume 2: Reasoning with Whole Numbers (2016)
3. Volume 3: Reasoning with Integers (2016)
4. Volume 4: Reasoning with Fractions (2016)
5. Volume 5: Reasoning with Decimals (2017)
6. Volume 6: Reasoning with Variables (2017)
7. Greenes, C., **Cavanagh, M.**, Tingey, S. (2013). *The Pipeline Story*. Book about Prime the Pipeline Project (P3): Putting Knowledge to Work, funded by the National Science Foundation.
8. Greenes, C., **Cavanagh, M.**, Tingey, S., Foote, N. (2012) *Arizona Science Center Mathematical Adventure*.

**Author/Co-Author of PreK- Grade 8 mathematics textbook programs**, teacher’s editions, resource books, games, and other ancillaries.

1. Charles, R., Caldwell, J., **Cavanagh, M.**, Copley, J., Crown W., Fennel, F., Murphy, S., Sammons, K., Schielack,J., Tate, W. (2012). *EnVisionMATH™ Common Core,* Grades K-6.4 editions: California, Texas, Florida and National*.* Glenview, IL: Pearson.
2. Charles, R., Caldwell, J., **Cavanagh, M.**, Copley, J., Crown W., Fennel, F., Murphy, S., Sammons, K., Schielack,J., Tate, W., Van de Walle, J. (2009). *EnVisionMATH™,* Grades K-6*.* Glenview, IL: Scott Foresman, Addison Wesley/Pearson.
3. Charles, R., Caldwell, J., **Cavanagh, M.**, Chancellor, D., Copley, J., Crown W., Fennel, F., Ramos, J., Sammons, K., Schielack,J., Tate, W., Thompson, M., Ramirez, A., Van de Walle, J. (2005). *Scott Foresman/Addison Wesley Mathematics* K-6 textbook program. Glenview, IL: Pearson.
4. Bennett, J., Calhoun, C., **Cavanagh, M.**, Croom, L, Krulick, S., Laing, R., Long, C., Murphy, S., Rudnick, J., Sherman, C., Small, M., Tate, W. (2001). *California Mathematics* K-6 textbook program.Glenview, IL: Scott Foresman, Addison Wesley.
5. Fennell, F., Ferrini-Mundy, J., Ginsburg, H., Greenes, C., Murphy, S. J., Tate, W., **Cavanagh, M.**, Altieri, M. B., Bennett, J., Calhoun, C., Croom, L., Laing, R., Sammons, K. B., Small, M., (1999 & 1998). *Silver Burdett Mathematics* Grades K-6 mathematics textbook program, **Senior Author** of Grades K-2. Parsippany, NJ: Silver Burdett Ginn, a Pearson Education Company.
6. Bolster, L. C., Boyer, C., Butts, T., **Cavanagh, M.**, Channel, M. W., Crown, W. D., Fair, J., Hamada, R. Y., Kelly, M. G., Leiva, M., Lindquist, M. M., Nibbelink, W. B., Proudfit, L., Rahlfs, C., Ramirez, R., Ramos, J. F., Robinette, G., Robitaille, D., Schultz, J. E., Shepardson, R., Swafford, J., Tucker, B., Van de Walle, J., Williams, D. E., Wisner, R. J. (1993 & 1991), *Exploring Mathematics,* Grades K-8 mathematics textbook program. Glenview, IL: Scott Foresman and Company.
7. Cavanagh, M. (2006). *CitySteps Math.* The mathematics component of ETA Cuisenaire’s Pre-K *CitySteps* Program.
8. Cavanagh, M. & Tucker, B. (1994 & 1991). *Great Beginnings,* alternative Grades K-2 mathematics program. Glenview, IL: Scott Foresman and Company.
9. Cavanagh, M., Cooney, T., & Fair, J. (1993). *Math Science Connections* Grades K-6 posters and teacher's manuals to integrate mathematics with science. Glenview, IL: Scott Foresman and Company.
10. Rucker, W., Dilley, C., **Cavanagh, M**. & Ockenga, E. (1988, 1987, 1985, 1983).  *Heath Mathematics Program*, K-8 Teacher’s Editions and Copymasters. Lexington, MA: D. C. Heath & Co.
11. Rucker, W., Dilley, C., & **Cavanagh, M**. (1988, 1987, 1985, 1983).  *Heath Mathematics Program*, Kindergarten Pupil Editions.
12. Cavanagh, M. (1983). *Problem Solving with Manipulatives Primary.* Lexington, MA: D. C. Heath & Co.
13. Cavanagh, M. (1983). *Problem Solving with Manipulatives Intermediate.* Lexington, MA: D. C. Heath & Co.
14. Cavanagh, M.(1988, 1985). *K-Plus.* Lexington, MA: D. C. Heath & Co.
15. Cavanagh, M. & Ockenga, E. (1981). *Mathematics Teachers Bonus Book*, Kindergarten & Grades 1-3, Boston, MA: Houghton Mifflin Co.

**Author/Co-Author** of K-8 mathematics handbooks, resource books, activity cards, and online resources:

1. Greenes, C., **Cavanagh, M.** & Findel, C. (2016). *Think Tanks: Spatial and Measurement Reasoning* (Grades 1- 6). Brisbane, Australia: ORIGO Education.
2. Greenes, C., Findell, C. & **Cavanagh, M**. (2012). *Math Problem Solving Packets* (Grades 1 - 6). New York: Scholastic.
3. Greenes, C., **Cavanagh, M.**, & Findell, C. (2012). *Developing Algebraic Reasoning* (9 modules, PreK – Grade 8), CK-12 Foundation (Open Source).
4. Greenes, C., **Cavanagh, M**., & Findell, C. (2008). *Algebra Readiness Made Easy: An Essential Part of Every Math Curriculum* (Grades 1-6). New York, NY: Scholastic.
5. Cavanagh, M. (2002). *Math to Learn* Grades 1-2 Mathematics Handbook and Teacher Resources Book, Boston, MA: Great Source Education Group, a Houghton Mifflin Company.
6. Cavanagh, M. (2000). *Math to Know* Grades 3-4 Mathematics Handbook and Teacher Resources Book, Boston, MA: Great Source Education Group, a Houghton Mifflin Company.

**Co-author** for *Navigations* Series, PreK-Gr. 2: Books published by National Council of Teachers of Mathematics to support NCTM’s *Principles and Standards for School Mathematics.*

1. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M.(2004).*Navigating through Number and Operations.* Reston, VA: National Council of Teachers of Mathematics.
2. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M.(2003). *Navigating through Measurement*. Reston, VA: National Council of Teachers of Mathematics.
3. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Small, M. (2001). *Navigating through Algebra,* Reston, VA: National Council of Teachers of Mathematics.
4. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M. (2003). *Navigating through Data,* Reston, VA: National Council of Teachers of Mathematics.
5. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M.(2003). *Navigating through Measurement,* Reston, VA: National Council of Teachers of Mathematics.
6. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M. (2003). *Navigating through Problem Solving and Reasoning* Pre K-K.Reston, VA: National Council of Teachers of Mathematics.
7. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M. (2004). *Navigating through Problem Solving and Reasoning* Grade 1.Reston, VA: National Council of Teachers of Mathematics.
8. Greenes, C, **Cavanagh, M**., Dacey, L., Findell, C., Sheffield, L., Small, M. (2004). *Navigating through Problem Solving and Reasoning* Grade 2. Reston, VA: National Council of Teachers of Mathematics.

**Lead author** of a series of 21 books, *Math, Science, and Beyond* K-6. Each book is approximately 140 pages of activities for family workshops in English and Spanish, funded by US Dept. of Education, No Child Left Behind Act–Improving Teacher Quality Program, Dwight D. Eisenhower Mathematics and State Grant Program (a.k.a. *Matemáticas y Ciencias Sin Límites)*. Solana Beach, CA: Books and Beyond:

1. Cavanagh, M. & Fine, E. (1993)*, Look, Listen, and Touch,* The Senses, Properties of matter, Grade K, Math, Science and Beyond Physical Science.
2. Cavanagh, M. & Fine, E. (1993). *Drops, Bubbles, and Flubber,* Solids, Liquids, and Gases, Properties of matter, Grade 1, Math, Science and Beyond Physical Science.
3. Cavanagh, M. & Fine, E. (1993). *Power Connection.,* Magnetism and Electricity, Systems and Interactions, Grade 2, Math, Science and Beyond Physical Science.
4. Cavanagh, M. & Fine, E. (1993). *Build and Balance,* Structure, Scale and Structure, Grade 3, Math, Science and Beyond Physical Science.
5. Cavanagh, M. & Fine, E. (1993). *Let the Force Be With You,* Simple Machines, Systems and Interactions, Grade 4, Math, Science and Beyond Physical Science.
6. Cavanagh, M. & Fine, E. (1993). *Come Fly with Me,* Aerodynamics, Systems and Interactions, Grade 5, Math, Science and Beyond Physical Science.
7. Cavanagh, M. & Fine, E. (1993). *More Than Magic,* Chemistry, Solutions and Reactions, Grade 6, Math, Science and Beyond Physical Science.
8. Cavanagh, M. & Fine, E. (1994).Splish! Splash!, Water, Properties of matter, Grade K, Math, Science and Beyond Earth Science.
9. Cavanagh, M. & Fine, E. (1994). *Puff and Blow, Air*, Patterns of Change, Grade 1, Math, Science and Beyond Earth Science.
10. Cavanagh, M. & Fine, E. (1994). *Nitty-Gritty Dirt and Fossils*, Dirt, Patterns of Change, Grade 2, Math, Science and Beyond Earth Science.
11. Cavanagh, M. & Fine, E. (1994). *Bolder Boulders*, Rocks and Minerals, Scale and Structure, Grade 3, Math, Science and Beyond Earth Science.
12. Cavanagh, M. & Fine, E. (1994). *Some Like It Cold*, Weather, Systems and Interactions, Grade 4, Math, Science and Beyond Earth Science.
13. Cavanagh, M. & Fine, E. (1994). *Galactic Odyssey*, Astronomy and Space, Systems and Interactions, Grade 5, Math, Science and Beyond Earth Science.
14. Cavanagh, M. & Fine, E. (1994). *A Delicate Balance*, Environment, Systems and Interactions, Grade 6, Math, Science and Beyond Earth Science.
15. Cavanagh, M. & Fine, E. (1995). *Crawlers, Hoppers, and Fliers,* Insects and other small creatures, Structures and Interactions, Grade K, Math, Science and Beyond Earth Science.
16. Cavanagh, M. & Fine, E. (1995). *Seeds and Sprouts,* Seeds, Structure, Grade 1, Math, Science and Beyond Earth Science.
17. Cavanagh, M. & Fine, E. (1995). *Eggs! Eggs! Eggs!,* Eggs, Structure, Grade 2, Math, Science and Beyond Earth Science.
18. Cavanagh, M. & Fine, E. (1995). *Wiggly Squiggly,* Earthworms and Mealworms, Structures and Interactions, Grade 3, Math, Science and Beyond Earth Science
19. Cavanagh, M. & Fine, E. (1995). *Newfangled Creature,* Animal Adaptations, Systems and Interactions, Grade 4, Math, Science and Beyond Earth Science.
20. Cavanagh, M. & Fine, E. (1995). *Eye Spy,* The Eye and Vision, Structures and Systems, Grade 5, Math, Science and Beyond Earth Science.
21. Cavanagh, M. & Fine, E. (1995). *What's Cookin'?,* Nutrition Testing, Reactions and Interactions, Grade 6, Math, Science and Beyond Earth Science.
22. Cavanagh, M. & Fine, E. (1998). *Zap, Twang, Buzz.* Math, Science, and Beyond.
23. Cavanagh, M. & Fine, E. (1998). *Cool Concoctions*. Math, Science, and Beyond.

**Author of mathematics games** and books of blackline masters.

1. Cavanagh, M. *Mighty Mathletes* (1999). Math, Science, and Beyond*.*.
2. Cavanagh, M. (1981). *Disney's Understanding Fractions,* Burbank, CA: Walt Disney Educational Media.
3. Cavanagh, M. (1981). *Disney's Fraction Practice,* Burbank, CA: Walt Disney Educational Media.
4. Cavanagh, M. (1981). *Disney's Following Directions,* Burbank, CA: Walt Disney Educational Media.
5. Cavanagh, M. (1990). *Math in Brief* game series.Fort Collins, CO: Scott Resources, Inc.
6. Cavanagh, M. (1978). *Math Soup* game series. Fort Collins, CO: Scott Resources, Inc.
7. Cavanagh, M. (1976). *Metric Madness.* Fort Collins, CO: Scott Resources, Inc.
8. Cavanagh, M. (1980). *Money Power.* Sunnyvale, CA: Enrich Inc.
9. Cavanagh, M. (1980). *Favorite Menus.* Sunnyvale, CA: Enrich Inc.
10. Cavanagh, M. (1980). *Telephone Power.* Sunnyvale, CA: Enrich Inc.
11. Cavanagh, M. (1980). *Money Sense.* Palo Alto, CA: Creative Publications, Inc.
12. Cavanagh, M. (1980). *Clock Wise*. Palo Alto, CA: Creative Publications, Inc.

**Author/Co-author** **of programs for State Department of** Education and school districts designed to support State Standards.

1. Cavanagh, M., \_\_\_\_\_\_\_, (2000). *Standards Based Performance Assessment, K-7 Mathematics.* San Diego, CA: San Diego County Office of Education.
2. Cavanagh, M. et al. (1981). *Handbook for Planning an Effective Mathematics Program*, Sacramento, CA: California State Department of Education.
3. Cavanagh, M. (1975). *Developing Logical Thinking with Attribute Block Activities.* Los Angeles, CA: Los Angeles Unified School District.

**Author** **of language arts resources:**

1. Cavanagh, M. (1981). *Word Soup* game series. Fort Collins, CO: Scott Resources, Inc.
2. Cavanagh, M. (1981). *Read, Search & Do*. Fort Collins, CO: Scott Resources, Inc.
3. Cavanagh, M. (1980). *Blends & Digraphs.* Sunnyvale, CA: Enrich Inc.
4. Cavanagh, M. (1980). *Comprehension Books 1-4, Read 'N' Write* series. Palo Alto, CA: Creative Publications, Inc.
5. Cavanagh, M. (1980). *Phonics Books 1-10, Read 'N' Write* series. Palo Alto, CA: Creative Publications, Inc.
6. Cavanagh, M. (1980). *Language Arts Books 1-6, Read 'N' Write* series. Palo Alto, CA: Creative Publications, Inc.
7. Cavanagh, M. (1982). *Phonics Books 1-4.* London, ENGL: Addison-Wesley Publishers Limited.

**PUBLICATIONS**

**Journal Articles**

1. Greenes, C., **Cavanagh, M**., Kim,J., Luc, J., Tian, Y and Worfram, T. “Problems without Figures” 1909 and 2016.” *OnCore*,Journal of the Arizona Association of Teachers of Mathematics, Spring 2016, pp.
2. Carole Greenes, Ed. D., **Cavanagh, M**., Yifan Tian. CalEquate: Increase Curiosity and Enhance Learning, *OnCore*, Journal of the Arizona Association of Teachers of Mathematics, Fall/Winter, 2015, pp.
3. Greenes, C, **Cavanagh, M.,** Kim, J., Durfee-Sherman, C., Smith, J., and Brehony, D. “Making Sense of Numbers: The Reading-Reasoning Connection.” *OnCore*, Journal of the Arizona Association of Teachers of Mathematics, Fall/Winter, 2014, pp. 19 – 34.
4. Greenes, C., **Cavanagh, M**., Tsankova, J., Glanfield, F., (2013). Can we cross the street in time?. Arlington, VA: *The Mathematics Teacher*, 19 (2). September, 2013. 86-93.
5. Cavanagh, M. (2012). Call the police! Integrating the arts with mathematics. *OnCore AATM Journal.* Tempe, AZ: Arizona Association for Mathematics Teachers.
6. Greenes, C., **Cavanagh, M.,** Wolf, S., Weight, S., Zehring, J. (2012). Prime the pipeline project (P3): Putting knowledge to work. *Contemporary Issues in Technology and Teacher Education*, *11*(1). <http://www.citejournal.org/vol11/iss1/mathematics/article1.cfm>.
7. Greenes, C. **Cavanagh, M**., & Findell, C. (2005). “Key Algebraic Ideas for Exploration by Young Students” in *Developing Students Algebraic Reasoning Abilities*, (C. Greenes and C. Findell, Eds.) Volume 3 in the NCSM & Houghton Mifflin Company School Division and McDougal Littell Monograph Series for Leaders in Mathematics Education. Boston: Houghton Mifflin Companies.
8. Cavanagh, M. (2004). *Challenging Young Children Mathematically.* Article for monograph for Leaders in Mathematics Education, National Council of Supervisors of Mathematics.
9. Cavanagh, M. (1974-76). *Adding It All Up*, monthly column in *Calculator*, Los Angeles, CA: Los Angeles City Teachers of Mathematics Association.

**Other Media**

1. Greenes, C., **Cavanagh, M**., Wolfe, S., et al. (2015). BioXFEL Education Program Update (7-minute video) Arizona State University, Chris Lamont Producer.
Wrote 1-minute introduction. Arizona State University, TBLR Productions.
2. Greenes, C., **Cavanagh, M**., Wolfe, S., et al. (2013). BioXFEL Outreach Education Program (7-minute video). Wrote 1-minute introduction. Arizona State University, TBLR Productions.
3. Greenes, C., **Cavanagh, M**., et al. (2010 – Present). *MATHgazine* (8 on-line issues per year, 4 pages each, for students in grades 8 – 12, Arizona State University, PRIME Center (Initial funding from NSF Pipeline Project). Contributor, *Balzano:* A logical reasoning feature.
4. Greenes, C., **Cavanagh, M**., et al. (2011 – Present) *MATHgazine Junior (*8 on-line issues per year, 4 pages each, for students in grades 4 - 8, Arizona State University, PRIME Center, (Initial funding from the Helios Education Foundation) STEM in the Middle Project. Contributor, *Balzano:* A logical reasoning feature.
5. Greenes, C., **Cavanagh, M**., Wolfe, S., et al. (2012) *Prime the Pipeline.* (10-minute video), Arizona State University, TBLR Productions. Assist with organization and editing.
6. Greenes, C., **Cavanagh, M**., Wolfe, S., et al. (2014). *STEM in the Middle.* (10-minute video). Arizona State University, TBLR Productions. Assist with organization and editing.