

Robin A. Ward, Ph.D.
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EDUCATION

University of Virginia

Ph.D., Mathematics Education, May 1997; GPA 3.98

Dissertation: "An Investigation of Scaling Issues and Graphing Calculator-Associated Misconceptions among High School Students." *Dissertation Abstracts International*, 58, 2124A.

Advisor: Dr. Joe Garofalo

Major Fields: mathematics education; instructional technology

Villanova University

M.A., Mathematics, August 1989 ; GPA 3.35

Immaculata College

B.A., Math/Physics with a minor in French, May 1986; GPA 3.93 (magna cum laude)

EMPLOYMENT

Rice University, Houston, TX (2007-present)

Rice University School Mathematics Project

Assistant Professor of Mathematics

Associate Director for Curriculum Integration

Responsibilities include teacher professional development for PreK-12 mathematics teachers, grant writing, and research.

All Saints' Episcopal School, Fort Worth, TX (2010-2018)

Ancillary Instructor, Mathematics

Developed and taught an integrated, literature-based, mathematics and visual arts program for the early childhood program.

Mathematics Coach/Tutor (2007-present)

Camp GEM[®] and Camp GEMS[®] Founder and Lead Teacher

Implement after-school and summer math and science camps for female elementary school students.

West University Methodist Pre-School, Houston, TX (2008-2010)

Part-time Ancillary Instructor

Developed and taught an integrated, literature-based, mathematics and visual arts program for the early childhood program.

University of Arizona, Tucson, AZ (2000-2007)

Assistant Professor of Mathematics Education

Taught elementary and secondary mathematics content and methods courses, mathematics education courses, technology courses, and teacher education courses; performed scholarly research, supervised student teachers, advised graduate students, and directed dissertations.

California Polytechnic State University, San Luis Obispo, CA (1997-2000)

Assistant Professor of Mathematics

Taught mathematics and mathematics education courses, advised students on their senior projects, served as a content educator for the University Center for Teacher Education.

SEI, Inc., Wayne, PA (1989-1993)

Systems Programmer/Project Leader

Developed new and modified existing software using FORTRAN for both large-scale and small-scale banks and trust institutions. Served as principal liaison for various clients assisting them in defining system requirements, insuring on-time delivery of software, and overseeing daily maintenance of software. As Project Leader, managed several programmers and oversaw the design, coding, testing, and installation of

software.

General Electric Company, Valley Forge, PA (1986-1989)

Aerospace Engineer

Designed, coded, and implemented software in SAS and FORTRAN for a large-scale simulator. Assisted lead engineers in the testing, debugging, and validating of prototype software. Consulted with users to resolve performance issues and to verify that system requirements were met. Granted special accesses requiring extensive background investigation (EBI).

PUBLICATIONS

Books

Ward, R. (2019). *Count on Texas: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Tull, A. & Ward, R. (2017). *Count on SMU: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Ward, R. (2017). *Count on UVA: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Ward, R. (2016). *Count on Villanova: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Ward, R. (2016). *Count on Arizona: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Ward, R. (2016). *Count on Rice: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Ward, R. (2015). *Count on TCU: Fun Facts from 1 to 12*. Herndon, VA: Mascot Books.

Ward, R. (2012). *Math + Art = Fun: Activities for Discovering Mathematical Magic in Modern Art*. Houston, TX: Bright Sky Press.

Ward, R. (2007). *Literature-Based Activities Integrating Mathematics with Other Content Areas, Grades K-2*. Boston, MA: Allyn & Bacon/Longman.

Ward, R. (2007). *Literature-Based Activities Integrating Mathematics with Other Content Areas, Grades 3-5*. Boston, MA: Allyn & Bacon/Longman.

Ward, R. (2007). *Literature-Based Activities Integrating Mathematics with Other Content Areas, Grades 6-8*. Boston, MA: Allyn & Bacon/Longman.

Ward, R. (2005). *Numeracy and Literacy: Teaching K-8 Mathematics Using Children's Literature*. Colorado Springs, CO: PEAK.

Book Chapters

Ward, R., & Troutman, S. (2012). If you want to motivate the learning of mathematics, then use the visual arts as a lens to learning. In D. Lapp & B. Moss (Eds.), *Exemplary Instruction in the Middle Grades: Teaching that Supports Engagement and Rigorous Learning*. New York: The Guilford Press.

Anhalt, C., Ward, R., & Vinson, K. (2004). The mathematics curriculum: Prosecution, defense, verdict. In K.D. Vinson & E.W. Ross (Eds.), *Defending the Public Schools: Volume 3: Curriculum Continuity and Change in the 21st Century* (pp. 47-60). Westport, CT: Praeger Perspectives.

Journal Articles

White, C., Papakonstantinou, A., Ekmekci, A., Ward, R. (2021). Lessons learned in 2020 as mathematics professional development for teachers transitioned to remote learning. *Academia Letters*, Article 3614. <https://doi.org/10.20935/AL3614>

Ward, R. (2021). How arts education supports social and emotional learning and academic success. In *Texas Cultural Trust 2021 State of the Arts Report*.

Ward, R., & Albritton, J. (Invited submission, 2020). Vasily Kandinsky's Versatile Art. *Mathematics Teacher: Learning and Teaching PK-12*, 113(9), 745-750.

Ward, R., & Albritton, J. (Invited submission, 2020). A "Composition" of Color and Mathematical Content. *Mathematics Teacher: Learning and Teaching PK-12*, 113(9), 772.

Ward, R. (June 2017). *Creating Colorful Klee Castles*. *ArtsEd Lab Digital Magazine*. <https://educationcloset.com/2017/06/01/creating-colorful-klee-castles/>

Ward, R., Albritton, J., Carsey, A., & Morales, V. (April 2016). Wondering about Warhol. *STEAMed Quarterly Digital Magazine*. <http://www.joomag.com/magazine/steamed-magazine-april-2016/0678717001459354061?short>

Ward, R. (January 2016). *Counting on a Starry Night*. *STEAMed Quarterly Digital Magazine*. <http://www.joomag.com/magazine/steamed-magazine-january-2016/0211531001450386140?short>

Ward, R. & Albritton, J. (October 2015). Math meets cubism. *STEAMed Quarterly Digital Magazine*. <https://www.joomag.com/magazine/steamed-magazine-october-2015/0392675001443452249?short>

Ward, R. & Wilson, Monica. (April 2015). Crayons in algebra class? *STEAMed Quarterly Digital Magazine*. <http://www.joomag.com/magazine/steamed-magazine-april-2015/0186174001427333405?short>

Ward, R. (2014). Go figure! Using the art of Jasper Johns to teach number concepts. *Dimensions of Early Childhood*, 42(2), 23-27. http://southernearlychildhood.org/upload/pdf/Ward_Vol42_2.pdf

Ward, R. (Fall/Winter 2013). Using the art of Paul Klee to teach fractions. *The Texas Math Teacher*, LX(2), 6-10. http://tctmonline.org/TCTMdrupal/sites/default/files/docs/TMT_archive/TMT_2010s/TMT_2013_Fall.pdf

Ward, R. (Summer 2013). Use mouth-watering art to master math concepts. *Texas Child Care Quarterly* 37(1). http://www.childcarequarterly.com/pdf/summer13_math.pdf

Ward, R. (Summer 2013). Constructing castles: Using the art of Paul Klee to explore shape. *Early Years: The Journal of the Texas Association for the Education of Young Children*, 34(2), 11-13.

Cruz, P, Kamau, N., Papakonstantinou, A, Parr, R., Troutman, S., Ward, R., & White, C. (Fall/Winter 2012/2013). Effective professional development: Defining the vital role of the master teacher. *NCSM Journal of Mathematics Education Leadership*, 14(2), 48-60.

Ward, R. (Fall 2008). Integrating mathematics and the visual arts. *The Charter Schools Resource Journal*. <http://www.ehhs.cmich.edu/~tcsrj/Ward3.pdf>

Muller, D., & Ward, R. (2007). Art and algebra? Middle school students discover algebra in Calder mobiles. *Mathematics in School*, 36(3), 15-21.

Ward, R. (Spring 2007). Providing authentic technology experiences for K-8 preservice teachers in elementary mathematics classrooms. *The Charter Schools Resource Journal*. <http://www.ehhs.cmich.edu/~tcsrj/articles.html>

Ofiesh, N., Rohas, C., & Ward, R. (2006). Applying principles of universal design to the assessment of student learning. *Journal of Postsecondary Education and Disability*, 19(2), 173-181.

Ward, R. (2006). Tessellations to the rescue. *Leading and Learning with Technology*, 33(7), 30.

Ward, R. (2006). Engaging students with special needs with graphing software. *Leading and Learning with Technology*, 33(6), 31.

Ward, R., & Muller, D. (September 2006). Algebra and art. *Mathematics Teaching*, 198, 22-26.

Ward, R. (Spring 2006). Modeling effective pedagogical strategies for teaching mathematics. *The Charter Schools Resource Journal*, 1-9. <http://www.ehhs.cmich.edu/~tcsrj/ward.pdf>

Anhalt, C., Ward, R., & Vinson, K. (2006). Teacher candidates' growth in designing mathematical tasks as exhibited in their lesson planning. *Teacher Educator*, 41(3), 172-186.

Ward, R. (2006). Paul Revere's mathematical ride: Integrating geography, mathematics, and children's literature. *Arizona Reading Journal*, XXXII(1), 24-26.

Ward, R. (January, 2006). One if by land; three if by sea? *Mathematics Teaching*, 194, 20-21.

- Szabo, Z., Ward, R., & Bailey, R. (2005). Efficacy sources for preservice teachers. *Academic Exchange Quarterly*, 9(4), 166-171.
- Ward, R. (2005). Impact of mentoring on teacher efficacy. *Academic Exchange Quarterly* 9(4), 148-154.
- Ward, R. (2005). Using children's literature to inspire K-8 preservice teachers' future mathematics pedagogy. *The Reading Teacher*, 59(2), 132-143.
- Ward, R. (2004). (Invited submission). Looking for math in all the right places. *The California Reader*, 38(2), 58-65.
- Ward, R. (2004). K-8 preservice teachers' journey into the global village: Exploring real-world data using children's literature and technology. *Arizona Reading Journal*, XXXI(1), 43-47.
- Ward, R. (2004). An investigation of K-8 preservice teachers' concept images and mathematical definitions of polygons. *Issues in Teacher Education*, 13(2), 39-56.
- Ward, R. (2004). K-8 preservice teachers author a mathematical piece of children's literature. *The California Reader*, 38(1), 24-30.
- Ward, R., Anhalt, C., & Vinson, K. (2004). K-8 teacher candidates' use of mathematical representations and the development of their pedagogical content knowledge as exhibited in their lesson planning. *FOCUS on Learning Problems in Mathematics*, 26(3), 1-11.
- Ward, R. (2003). How much is a billion? A lot more than you think! *Arizona Reading Journal*, XXX(1), 27-29.
- Ward, R. (2003). Teaching tessellations to preservice teachers using *Tesselmania! Deluxe*: A Vygotskian approach. *Information Technology in Childhood Education Annual*, 2003(1), 69-78.
- Ward, R. & Anhalt, C. (2002). An investigation of preservice teachers' understanding of the area of a parallelogram. *Issues in Teacher Education*, 11(2), 43-52.
- Ward, R. (August 2002). Angle measurement of aircraft wings and tails: A classroom activity for grades 5-8. *NASA Aerospace Technology Resource Guide: Centennial Flight Edition*. Lesson plan appearing on a CD-ROM produced by the NASA Dryden Flight Research Center Education Office.
- Ward, R. (2000). (Invited Submission; Special Focus Issue). Observing high school students' strategies and misconceptions as they use graphing calculators. *FOCUS on Learning Problems in Mathematics: Using Technology for the Teaching and Learning of Mathematics*, 22(3&4), 28-40.
- Ward, R. (1999). Using dominoes as fractions (to uncover misconceptions and discover deep understandings!). *Teaching Mathematics in the Middle School*, 5(3), 162-165.
- Ward, R. (November 1999). Graphing calculator-associated misconceptions among high school students. *Proceedings of the Twelfth Annual International Conference on Technology in Collegiate Mathematics (ICTCM)*, p. 410-414.
- Ward, R. (June, 1998; Invited Paper). Graphing calculator-associated strategies used by and misconceptions of high school students. <http://mathforum.org/technology/papers/>
- Ward, R. (1997). An investigation of scaling issues and graphing calculator-associated misconceptions among high school students. *Dissertation Abstracts International*, 58, 2124A.

Other publications

Ward, R. STEAM in the K-8 Classroom: Conference Preview (Put on Your Math Goggles! Seeing Math in Art). *EducationCloset.com*. <https://educationcloset.com/2015/07/14/put-on-your-math-goggles-seeing-math-in-art/>

Ward, R. "Art in Mathematics Classrooms? Why Not?" published in *Rice at Large* (Summer 2015). Article describes teachers of grades K-3 partaking in an online course focused on integrating math and the visual arts. <https://publicaffairs.rice.edu/sites/g/files/bxs501/f/pdf/ral/RALsummer15.pdf>

Ward, R. "Professor Connects Math, Literacy, and the Visual Arts" published in *Rice at Large* (Spring 2008). Article articulates an integrated math-visual arts program implemented at a local preschool. <https://publicaffairs.rice.edu/sites/g/files/bxs501/f/pdf/ral/RALspring08.pdf>

Ward, Robin. "Put on Your Math Goggles! Showcasing the Accomplishments of Mathematicians" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/9254>). Posting describes how fifth graders engaged in a biographical exploration of famous mathematicians.

Ward, Robin. "Put on Your Math Goggles! Seeing Circles in Art" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/7610>). Posting describes how preK students used the artwork of Wayne Thiebaud to see and describe characteristics of circles.

Ward, Robin. "Put on Your Math Goggles! Seeing Circles in a Kandinsky" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/8486>). Posting describes how third graders explored characteristics of circles (radius, diameter, circumference) using the art of Wassily Kandinsky.

Ward, Robin. "Put on Your Math Goggles! Seeing Triangles in Op Art" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/7505>). Posting describes how pre-kindergarteners explored triangles using the art of Bridget Riley.

Ward, Robin. "Put on Your Math Goggles! Seeing Rectangles in a Mark Rothko" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/7519>). Posting describes how pre-kindergarteners explored rectangles using the art of Mark Rothko.

Ward, Robin. "Put on Your Math Goggles! Exploring Symmetry in Robert Indiana's LOVE Art" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/6597>). Posting describes how pre-kindergarteners explored symmetry in letters using the art of Robert Indiana.

Ward, Robin. "Put on Your Math Goggles! Seeing Patterns in a Romero Britto" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/6885>). Posting describes how third graders used their own Romero Britto-inspired art to explore patterns and combinations.

Ward, Robin. "Put on Your Math Goggles! Seeing Math in a Paul Klee" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/6807>). Posting describes an interdisciplinary activity in which third graders used their own Paul Klee-inspired *Castle and Sun* masterpieces to explore estimation and two- and three-dimensional shapes.

Ward, Robin. "Put on Your Math Goggles! Seeing Math in a Warhol" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/6718>). Posting describes an interdisciplinary activity in which second graders used their own Warhol-inspired art to explore arrays and multiplication.

Ward, Robin. "Put on Your Math Goggles! Seeing Math in a Jasper Johns" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/5952>). Posting describes how second graders used their *Figures* artwork, created in the spirit of Jasper Johns' *Color Numeral Series* (1969), as a springboard to a lesson on place value.

Ward, Robin. "Put on Your Math Goggles! Creating and Interpreting Bar Graphs Using *The Starry Night*" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/5972>). Posting describes an interdisciplinary activity in which kindergarteners used their own *Starry Night* masterpieces to explore data analysis and graphing.

Ward, Robin. "Put on Your Math Goggles! Exploring Linear Equations Using Sol LeWitt's Wall Drawings" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/5573>). Posting describes how seventh and eighth grade algebra students used the conceptual artwork of Sol LeWitt to explore the graphing of linear equations.

Ward, Robin. "Put on Your Math Goggles! Exploring Measurement Using Josef Albers' Squares" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/5499>). Posting describes how fifth graders used the artwork of Josef Albers to challenge their proportional reasoning skills.

Ward, Robin. "Put on Your Math Goggles! Exploring M.C. Escher's Tantalizing Tessellations" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/5272>). Posting describes how fifth graders used the artwork of M.C. Escher to come to a deeper, hands-on understanding of how transformations are used in the creation of tessellations.

Ward, Robin. "Put on Your Math Goggles! Counting with Seurat" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/5214>). Posting describes how preK students used the pointillist artwork of Georges Seurat to compare and count quantities.

Ward, Robin. "Put on Your Math Goggles! Seeing Math in a Picasso" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/4989>). Posting describes how second graders used the artwork of Picasso to distinguish, compare, and contrast 2D and 3D shapes.

Ward, Robin., "Put on Your Math Goggles! Seeing Math in a Mondrian" published on the National Association of Independent Schools' *Inspiration Lab* website (<http://inspirationlab.org/story/4844>). Posting describes how kindergarteners used the artwork of Mondrian to explore lines and shapes.

MEDIA/CITATIONS

Featured in the story, "Put on Your Math Goggles with Dr. Robin Ward!" (July, 2022) published by Foster Angels-Central Texas. Article describes how Foster Angels campers participated in a two-day camp where they created art in the spirit of Wayne Thiebaud, Paul Klee, Vincent van Gogh, and others while exploring mathematical concepts and skills. <https://fosterangelsctx.org/put-on-your-math-goggles/>

Featured in the story, "Robin's Hood" (July, 2021) published in *Neighbors of Tarrytown*. Article describes Ward's career as an aerospace engineer, mathematics professor, arts advocate, and parent.

Featured in the story, "Rice University School Mathematics Project Celebrates 35 Years of Making Math Fun!" (July 13, 2021) published in *Village News/Southwest News*, 37(10), pp. 1, 5.

Featured in the story, "West Side Stories: Dr. Robin Ward" (June 24, 2021) published in *West Austin News*, 2. Article describes Ward's career as an aerospace engineer, mathematics professor, arts advocate, and parent.

Featured in the story, "RUSMP's Spring Networking Conference Goes Virtual" (April 20, 2021) published in *Village News*, 36(46), 7. Article describes Ward's contribution to RUSMP's spring virtual networking conference (<https://edition.pagesuite-professional.co.uk/html5/reader/production/default.aspx?pubname=&eid=c93ea94a-314a-462b-ac28-5be094efa4be>).

Featured in the story, "RUSMP's First Virtual Networking Conference Was a Huge Success" (October 13, 2020) published in *Village News*, 36(20), 1. Article describes Ward's contribution to RUSMP's fall virtual networking conference (<https://edition.pagesuite-professional.co.uk/html5/reader/production/default.aspx?pubname=&eid=6b482bb4-3f9d-4d4b-aca0-55b29a8ff201>).

Featured in the story, "Rice Offers Free Math Activities During COVID-19" published by *Rice at Large* (Spring 2020). Article describes Ward's creation of a website housing math-art activities, along with other resources on the RUSMP website (<https://ral.rice.edu/stories/2020/spring/rice-offers-free-math-activities-during-covid-19>).

Featured in the story, “New to Home Schooling? RUSMP Offers PreK-12 Mathematics Resources for At-Home Use” published by *The Village News* (April 7, 2020). Article describes Ward’s creation of a website housing math-art activities, along with other resources on the RUSMP website (<https://edition.pagesuite.com/html5/reader/production/default.aspx?pubname=&pubid=833555a5-ac94-4b0b-9a4f-0e43e4cb75c0>).

Featured speaker on “A Seat at the Table” panel, discussing women in the workplace (February 2020) (<https://www.youtube.com/embed/ca2A1N9W4DA?&rel=0>).

Featured in the story, “Rice Offers Free Math Activities for Children During COVID-19” published by the Rice University Office of Public Affairs (April 6, 2020). Article describes Ward’s creation of a website housing math-art activities, along with other resources on the RUSMP website (<https://news.rice.edu/2020/04/02/rice-offers-free-math-activities-for-children-during-covid-19/>).

Featured in the story, “Exploring Linear Equations Using Art” published by Rimwe Educational Resources (<http://www.rimwe.com/the-solver-blog/82.html>). Article describes Ward’s use of Sol LeWitt’s conceptual art to teach the graphing of linear equations.

Featured in the story, “Put on Your Math Goggles” published in the journal *Innovate* by All Saints’ Episcopal School (Winter/Spring 2014). Article describes Ward’s use of the visual arts in the teaching and learning of mathematics.

Featured in the story, “O’Hara Grad Making an Impact on Education” published in the *Cardinal O’Hara Magazine* (October, 2012). Posting describes Ward’s contributions to the teaching and learning of mathematics.

Featured in the story, “Applied Arts” published in *Dallas Child* (September 2012, p. 14). Article describes Ward’s book, *Math + Art = Fun*.

Featured in the story, “Robin + Idea = Book” published in *Fort Worth, Texas Magazine* (August 2012, p. 28). Article describes Ward’s book, *Math + Art = Fun*.

Featured in the story, “Preschoolers Learn Math and Art from a Rocket Scientist” published in the *All Saints’ Episcopal School Saints Today* (Winter, Spring 2011). Article describes an integrated mathematics-visual arts program for preschool children enrolled at All Saints’ Episcopal School in Fort Worth, TX.

Featured in the story, “Program Adds Art to Math” published in the *Fort Worth Business Press – Private School Guide* (September 2010). Article describes an integrated mathematics-visual arts program for preschool children enrolled at All Saints’ Episcopal School in Fort Worth, TX.

Featured in the story, “West U Methodist School Sets the Standard with the New Cutting Edge Program Focusing on Math, Literacy, and the Visual Arts for Boys & Girls” published in the *West U Methodist School Newsletter* (September-October, 2008). Article describes an integrated mathematics-visual arts program for preschool children.

Featured in the story, “Students Explore Mathematics Using the Lens of the Visual Arts at Rice University” published in the *Village News* (July 29, 2008). Article recounts an integrated math-art lesson in which first graders from Shadow Oaks Elementary learned about squares and rectangles in Piet Mondrian’s works.

Featured in the story, “Study of Water and Land Prepares Students for Earth Day” published in the *Village News* (April 22, 2008). Article recounts an interactive, literature-based, integrated lesson taught to gifted and talented kindergarteners involving the land-water ratio on earth.

Feature subject of the “Photos from You” section appearing in the *Houston Chronicle* online (<http://www.chron.com/neighborhoods/bellaire/>) (April, 2008). Photo captures first-graders from Shadow Oaks Elementary who experienced the connections between mathematics and the visual arts by creating their own Mondrian-like masterpieces.

Featured in the story, “Lunar Eclipse Makes a Shadow over West U. Elementary” published in the *Village News* (March 4, 2008). Article recounts an interactive lesson taught to gifted and talented kindergarteners

involving lunar eclipses and moon phases.

Feature subject of the “Photos from You” section appearing in the *Houston Chronicle* online (<http://www.chron.com/neighborhoods/bellaire/>) (February 27, 2008). Photo captures students learning how a lunar eclipse occurs.

Tobias, S., Ward, R., & Socha, K. Co-creator and co-designer of the *Women in Mathematics* Poster. Joint venture with the Association for Women in Mathematics to celebrate current day females’ achievements in mathematics, the sciences, and technology (2005-present).

Feature subject of the story, “UA Professor Uses Experience for Exploration” published in the *Arizona Daily Wildcat* (February 16, 2004). See: http://wc.arizona.edu/papers/97/97/01_5.html

Featured in editorial entitled, “Girls’ Failure at Math Merely Fiction,” *Arizona Daily Star*, August 29, 2003, p. B4.

Feature subject of the story, “Love of Math Adds Up to a Career Teaching Teachers,” *Arizona Daily Star* (September 2002, p. E1).

Ward, R. Website (<http://www.ed.arizona.edu/ward/math-nasa.htm>) developed via funding through a grant from the NASA Dryden Flight Research Center was cited on p.38 in chapter 3, “Links to Mathematics Teaching Resources” in the book, *Mathematics on the Internet: A Resource for K-12 Teachers* (2002) by J.A. Ameis & J.V. Ebenezer.

Ward, R. Website (<http://www.ed.arizona.edu/ward/math-nasa.htm>) developed via funding through a grant from the NASA Dryden Flight Research Center was cited in the fall 1999 issue of *The Flyer* (p. 1), published by NASA Dryden Flight Research Center.

Feature subject of the story, “Award-Winning K-12 Web Site Emphasizes Geography and Math,” *The Flyer*, published by the NASA Dryden Flight Research Center (Fall 1999, p. 1).

Ward, R. Website (<http://www.ed.arizona.edu/ward/math-nasa.htm>) developed via funding through a grant from the NASA Dryden Flight Research Center was cited in the March 1999 (vol. 35, No. 8, p. 12) issue of the National Council of Teachers of Mathematics News Bulletin in the *Web Bytes* section.

SELECT CONFERENCE PRESENTATIONS

Ward, R. (Invited speaker). *Put on Your Math Goggles: Seeing Math in Art*. Rice University School Literacy and Culture’s 2017 Early Literacy Conference, Houston TX. Participants will put on their “math goggles” and bring preK math concepts to life using the lens of the visual arts. Connections to children’s literature will be explored (Spring 2017).

Ward, R. *Algebra and Art: Sol LeWitt Meets the Coordinate Grid*. NCTM 2017 Conference, San Antonio, TX. Participants will discover and explore the wall drawings of the conceptual artist, Sol LeWitt, and then engage in the creation of a mathematical masterpiece containing linear equations (April, 2017).

Ward, R. (Keynote Speaker). *Put on Your Math Goggles: Seeing the Math TEKS in the Visual Arts*. 2016 Rice University School Mathematics Project (RUSMP) Spring Networking Conference, Houston, TX. Engaged participants in an exploration and discussion of how to integrate the visual arts into STEM (February 2016).

Ward, R (Featured speaker). *Algebra and Art: Sol LeWitt Meets the Coordinate Grid*. Southwestern Association of Episcopal Schools (SAES) 2015 Conference, Sugarland, TX. Participants will discover and explore the wall drawings of the conceptual artist, Sol LeWitt, and then engage in the creation of a mathematical masterpiece containing linear equations (November 2015).

Ward, R. *Put on Your Math Goggles! See Math in Art*. Southwestern Association of Episcopal Schools (SAES) Conference, Sugarland, TX. Participants will put on their “math goggles” and bring preK math concepts to life using the lens of the visual arts (November 2015).

Ward, R. *Put on Your Math Goggles! Seeing Mathematics in Art (Grades 2-3)*. 2015 Summer Online

Connectivity Arts Integration & STEAM Conference sponsored by EducationCloset.com. Participants will discover how to transform their mathematics classrooms into art galleries by integrating art into mathematics lessons (July 2015).

Ward, R. (Keynote Speaker). *Put on Your Math Goggles: Full STEAM Ahead!* 2015 Rice University School Mathematics Project (RUSMP) Spring Networking Conference, Houston, TX. Engaged participants in an exploration and discussion of how to integrate the visual arts into STEM (February 2015).

Ward, R. *Put on Your Math Goggles!: Exploring Math in Art (Grades PK-4)*. 2014 Conference for the Advancement of Mathematics Teaching (CAMT), Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2014).

Ward, R. *Viewing Mathematics and Science Through the Lens of the Visuals Arts: Transforming STEM to STEAM*. 7th Annual Texas STEM Conference, Dallas, TX. Engaged participants in a variety of hands-on activities demonstrating the connection between mathematics/science and the visual arts (February, 2014).

Ward, R. *Put on Your Math Goggles!: Seeing Mathematics in Art*. 2013 NCTM Annual Conference and Exposition, Denver, CO. Participants engaged in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (April 2013).

Ward, R. *Put on Your Math Goggles!: Discover PreK-2 Mathematics in Art*. 2012 NCTM Regional Conference and Exposition, Dallas, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (October 2012).

Ward, R. *Put on Your Math Goggles: Viewing PreK-4 Mathematics Using the Lens of the Visual Arts and Children's Literature*. The Conference for the Advancement of Mathematics Teaching (CAMT), Houston, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2012).

Ward, R. *Put on Your Math Goggles: Seeing Math in Art*. Southwestern Association of Episcopal Schools (SAES) Early Learning Retreat, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (June 2012).

Ward, R. *Put on Your Math Goggles!: Discover PreK-2 Mathematics in Art*. 2012 NCTM Annual Conference and Exposition, Philadelphia, PA. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (April 2012).

Ward, R. *Integrating Visual Arts and Children's Literature to Explore Grades Pre-K-2 Mathematics*. 57th Annual Conference for the Advancement of Mathematics Teaching (CAMT), Grapevine, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2011).

Ward, R. *Math Goggles: Discovering PreK-2 Mathematics in the Visual Arts*. 2011 NCTM Annual Conference, Indianapolis, IN. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (April 2011).

Ward, R. *Connecting Mathematics, the Visual Arts, and Children's Literature in PreK-1*. Kindergarten Teachers of Texas (KToT) Annual Conference, Dallas, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (October 2010).

Ward, R. (Invited keynote speaker). *Math Goggles: Teaching Kids to See the Magic and Multitude of Mathematics in Art*. Rice University School Mathematics Project 2010 Summer Campus Program – Administrators' Day, Houston, TX. Presented innovative ideas on how to integrate the visual arts into the teaching of PreK-12 mathematics (June 2010).

Ward, R. *Math Goggles: Discovering Grades PreK-2 Mathematics in the Visual Arts and Children's Literature*. 2010 NCTM Annual Conference, San Diego, CA. Session selected as one of the Professional Development Focus of the Year Learn↔Reflect Strand sessions. Engaged participants in a variety of

literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (April 2010).

Ward, R. (Invited speaker). *Using the Lens of Children's Literature and the Visual Arts to Explore (and Enjoy!) Mathematics*. 2010 Fridays@Neuhaus series, Houston, TX. Engaged parents and teachers of students in Grades PreK-4 in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts. (February 2010).

Ward, R. *Using the Lens of Children's Literature and the Visual Arts to Explore Mathematics*. Early Childhood Methodist Conference (ECMC), Houston, TX. Engaged preschool and PreK teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (February 2010).

Ward, R. (Invited speaker). *Using the Lens of the Visual Arts and Children's Literature to Explore PreK-2 Mathematics*. 2009 Houston Area Association for the Education of Young Children (HAAEYC) Conference, Houston, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (October 2009).

Ward, R. (Invited speaker). *Integrating Mathematics and Science and Other Content Areas in K-12*. Pearson Education Conference, Houston, TX. Engaged participants in a discussion about making connection between and among mathematics, science, and other content areas using children's literature (October 2009).

Ward, R. (Invited speaker). *Using the Lens of Children's Literature and the Visual Arts to Explore PreK-2 Mathematics*. Texas Association for the Education of Young Children (TAEYC) 2009 Conference, Galveston, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (September 2009).

Ward, R. *Integrating Visual Arts and Children's Literature to Explore Grades Pre-K-2 Mathematics*. 56th Annual Conference for the Advancement of Mathematics Teaching (CAMT), Houston, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2009).

Ward, R. (Invited speaker). *Viewing Mathematics through the Lens of the Visual Arts*. Rice University's Summer Math Days, Houston, TX. Engaged twenty high school students in an integrated mathematics-art activity featuring squares and rectangles and the work of Piet Mondrian, as well as others (June 2009).

Ward, R. *Using the Lens of the Visual Arts and Children's Literature to Explore Grades Pre-K-2 Mathematics*. 2009 NCTM Annual Conference, Washington, DC. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (April 2009).

Ward, R. (Invited speaker). *Connecting Mathematics to the Visual Arts*. 2009 Expanding Your Horizons Conference, Houston, TX. Engaged two cohorts of middle school females in a variety of hands-on activities demonstrating the connection between mathematics and the visual arts (February 2009).

Ward, R. (Invited speaker). *Numeracy and Literacy: Teaching K-8 Mathematics Using Children's Literature*. 29th Annual Reading/Language Arts Conference, San Diego, CA. Explored the power and potential of using children's literature to teach K-8 mathematics (June 2008).

Ward, R. (Keynote speaker). *Numeracy and Literacy: Teaching K-8 Mathematics Using Children's Literature*. 2008 Rice University Spring Networking Conference, Houston, TX. Explored the power and potential of using children's literature to teach K-8 mathematics (February 2008).

Ward, R. & Frey, N. (Invited speaker). *What Counts in Schools? Numeracy, Literacy, and Inclusive Practices*. 2007 Conference on Inclusive Education, Denver, CO. Engaged participants in activities and discussion featuring the use of children's literature to enhance literacy and numeracy with a focus on inclusive practices (February 2007).

Ward, R. & Fisher, S. *Best Practices in a K-8 Elementary Mathematics Methods Course*. National Council

of Teachers of Mathematics (NCTM) Regional Conference, Phoenix, AZ. Presented the results of a study detailing (1) the essential ingredients of a field-based elementary mathematics methods course in order to best prepare K-8 preservice teachers for student teaching and (2) how a mentor teacher training program assisted the development of student teachers' mathematics instruction (November 2006).

Ward, R. (Invited speaker). *Numeracy and Literacy: Teaching K-8 Mathematics Using Children's Literature*. 27th Annual Reading/Language Arts Conference, San Diego, CA. Explored the power and potential of using children's literature to teach K-8 mathematics (June 2006).

Ward, R. (Invited speaker). *Using Children's Literature to Explore Data in the Middle School Classroom*. Second Annual Mathematics Educators Appreciation Day, Tucson, AZ. Engaged participants in an integrated mathematics and social studies lesson featuring children's literature (January 2006).

Eiting, C., Bouley, M., D'Amore, D., & Ward, R. *Providing Instructional Leadership through Technology*. National Staff Development Council (NSCD) Conference, Philadelphia, PA. Presented findings and implications of a web-based mentor teacher project funded through an ABOR grant (December 2005).

Ward, R. (Invited speaker). *Using Children's Literature to Inspire K-8 Preservice Teachers' Future Mathematics Pedagogy*. 2005 Annual Teachers Applying Whole Language (TAWL) Fall Conference, Tucson, AZ. Presented and engaged participants in K-8 mathematics activities featuring children's literature (October 2005).

D'Amore, D., Bouley, M., Long, L., & Ward, R. *Teacher 2 Teacher: Improving Teacher Practice*. Association for Supervision and Curriculum Development (ASCD) Conference, Orlando, FL. Presented findings and implications of a web-based mentor teacher project (April, 2005).

Ward, R., & Fisher, S. *Transitioning from an Elementary Math Methods Course to Student Teaching*. National Council of Teachers of Mathematics (NCTM) Annual Conference, Anaheim, CA. Presented the results of a study detailing (1) the essential ingredients of a field-based elementary mathematics methods course in order to best prepare K-8 preservice teachers for student teaching and (2) how a mentor teacher training program assisted the development of student teachers' mathematics instruction (April 2005).

Ward, R. *Exploring Data Using The Graph Club*. Thirteenth Annual Teaching and Technology Conference: A Conference for Educators, Tucson, AZ. Participants learned how to make the teaching and learning of data collection and interpretation more engaging for K-4 students by integrating the software, *The Graph Club*, into the curriculum (January 2005).

D'Amore, D., Bouley, M., Long, L., & Ward, R. *Teacher 2 Teacher: Improving Teacher Practice*. Association of Educational Service Agencies (AESAs) Annual Conference, Phoenix, AZ. Presented findings and implications of a mentor teacher project funded through an ABOR grant (December 2004).

Szabo, Z., Ward, R., Bailey, R., & Sabers, D. *Providing K-12 Preservice Teachers with Classroom Assessment Experiences*. Arizona Education Research Organization Conference, Tempe, AZ. Presented results of an NSF funded grant where K-12 preservice teachers gained experience with using rubrics in assessing an introductory engineering course (October 2004).

Bailey, J., Prather, E., Johnson, B., Slater, T., & Ward, R. *Results on Research into Students' Ideas about Stars and Star Formation*. Association of American Physics Teachers Annual Conference, Phoenix, AZ. Presented research findings on undergraduate students' notions about stars (August 2004).

Anhalt, C., Ward, R., & Vinson, K. *Prospective Teachers' Design of Academic Tasks as Exhibited in Their Lesson Planning*. Annual Meeting of the American Educational Research Association (AERA) Research in Mathematics Education Special Interest Group (SIG), San Diego, CA. Presented results of a study detailing K-8 teacher candidates' choices of academic tasks in their lesson planning (April 2004).

Ward, R. *Exploring Data Using The Graph Club*. Twelfth Annual Teaching and Technology Conference: A Conference for Educators, Tucson, AZ. Participants learned how to make the teaching and learning of data collection and interpretation more engaging for K-4 students by integrating the software, *The Graph Club*, into the curriculum (January 2004).

Anhalt, C., & Ward, R. *Mathematical Representation and Cognitive Demands: An Investigation of Prospective Elementary Teachers' Planning for Mathematics Instruction*. Research in Undergraduate Mathematics Education (RUME) Conference, Scottsdale, AZ. Discussed how K-8 preservice teachers plan for the teaching of various mathematical topics using the notion of representation and task (October 2003).

Ward, R. *Using the WWW to Make the Teaching and Learning of Mathematics More Engaging*. Eighth Annual Learning Technology Showcase, Tucson, AZ (May 2003).

Anhalt, C., Ward, R., & Vinson, K. *Mathematical Representations and Pedagogical Content Knowledge: An Investigation of Prospective Teachers' Development*. Annual Meeting of the American Educational Research Association (AERA) Special Interest Group (SIG), Chicago, IL. Discussed the results of a study in documenting how K-8 teacher candidates represent mathematical ideas in ways that are comprehensible to their students (April 2003).

Ward, R., & Anhalt, C. *K-8 Preservice Teachers' Use of Representation and Task in Lesson Planning*. Thirtieth Annual Conference of the Research Council for Mathematics Learning (RCML), Phoenix, AZ. Discussed how K-8 preservice teachers plan for the teaching of various mathematical topics using the notion of mathematical representation (March 2003).

Ward, R. (Invited speaker). *Why Math? Women in Science, Technology, and Engineering: Defining Issues, Leading Change* Conference, Tucson, AZ. Spoke to high school and college age women about the challenges and rewards of pursuing a technical career (October 2002).

Ward, R. (Invited paper). *An Investigation of K-8 Preservice Teachers' Pedagogical and Content Knowledge of Certain Elementary Mathematics Topics*. Issues in Curriculum, Instruction and Teacher Education Symposium, Annual Meeting of the American Educational Research Association, New Orleans, LA (April, 2002).

Ward, R., & Anhalt, C. *Probing Preservice Teachers' Understanding of the Area of a Parallelogram*. National Council of Teachers of Mathematics (NCTM) Annual Conference, Las Vegas, NV. Shared insight into K-8 preservice teachers' conceptual and procedural understandings of the area formula of a parallelogram. Videotape clips of the preservice teachers explaining their solutions to the problem were shown. Audience engaged in hands-on activities that effectively teach the concept of area (April 2002).

Ward, R., & Anhalt, C. *Prospective Elementary Teachers' Development of Mathematical Pedagogical Knowledge*. Twenty-Ninth Annual Conference of the Research Council for Mathematics Learning (RCML), Memphis, TN. Discussed the conceptual understandings and pedagogical content knowledge of prospective K-8 teachers enrolled in an elementary mathematics methods course (March 2002).

Ward, R. (Invited speaker). *Connecting Mathematics with the Arts and Showcasing the Mathematics of NASA*. Southeastern Consortium for Minorities in Engineering (SECME) Summer Institute, University of Arizona. Hosted two technology-based, hands-on workshops for fifty K-12 teachers (July 2001).

Ward, R. *Preservice Teachers' Misconceptions about Various Geometry Topics*. Twenty-Seventh Annual Conference of the Research Council for Mathematics Learning (RCML), Las Vegas, NV (March 2000).

Ward, R. *Graphing Calculator Associated Misconceptions among High School Students*. Twelfth Annual International Conference on Technology in Collegiate Mathematics (ICTCM), San Francisco, CA (November 1999).

Ward, R. (Invited speaker). *Graphing Calculator Associated Misconceptions among High School Students*. Eisenhower National Clearinghouse-National Council of Teachers of Mathematics (ENC-NCTM) Conference and Workshop: The Role of Technology and Examples in *The Principles and Standards* Document, Washington, DC (June 1999).

Ward, R. (Invited speaker). *Making the Learning of Mathematics More Meaningful and Fun Using Web-Based Materials*. NASA Educational Workshop (NEW), NASA Dryden Flight Research Center, Edwards Air Force Base, Edwards, CA. Engaged thirty exemplary K-12 teachers chosen from across the U.S. in a

variety of hands-on, web-based, mathematics activities showcasing NASA Dryden's research endeavors (Summers 1999 - 2002).

TRAININGS/PROFESSIONAL DEVELOPMENT/INSERVICES

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Seeing Math in Art (A Virtual Course)*, Houston, TX. Engaged twenty PreK-2 teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2022).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Seeing Math in Arts*. Rice University School Mathematics Project 2020 Summer Campus Program, Houston, TX. Engaged three cohorts of PreK-12 teachers in integrated mathematics-visual arts activities (June 2022).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Seeing Math in Art*. Lyons Elementary School, Houston, TX. Engaged ten preK-K teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (March 2022).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Seeing Math in Arts*. Rice University School Mathematics Project 2020 Summer Campus Program, Houston, TX. Engaged three cohorts of elementary and middle school teachers in integrated mathematics-visual arts activities (June 2020, 2021, 2022).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Seeing Math in Art*. Good Shepherd Episcopal School, Austin, TX. Engaged ten preK teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (August 2019).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Discovering Geometry and Data Analysis in the Visual Arts*. Rice University School Mathematics Project 2016 Summer Campus Program, Houston, TX. Engaged four cohorts of teachers of grades K-3, 4-6, 7-8, and 9-12 in integrated, literature-based, mathematics-visual arts activities (June 2016).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Discovering Number in the Visual Arts*. Rice University School Mathematics Project 2015 Summer Campus Program, Houston, TX. Engaged four cohorts of teachers of grades K-3, 4-6, 7-8, and 9-12 in integrated, literature-based, mathematics-visual arts activities (June 2015).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Discovering Geometry and Measurement in the Visual Arts*. Rice University School Mathematics Project 2014 Summer Campus Program, Houston, TX. Engaged four cohorts of teachers of grades K-3, 4-6, 7-8, and 9-12 in integrated, literature-based, mathematics-visual arts activities (June 2014).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Exploring Number in Art*. Educational First Steps, Fort Worth, TX. Engaged twenty teachers of ages 2-6 years old in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (May 2014).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Exploring Number Concepts in Art*. Everman ISD, Fort Worth, TX. Engaged two cohorts of ninety kindergarten teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (January 2014).

Ward, R. *Using Base 10 Blocks to Teach Addition, Subtraction, Multiplication, and Division (Grades K-3)*. All Saints' Episcopal School, Fort Worth, TX. Engaged participants in understanding the algorithms for addition, subtraction, multiplication, and division of whole numbers by using base 10 blocks. Explored alternative algorithms for the various operations (August 2013).

Ward, R. *Put on Your Math Goggles!: Seeing Number in Art (Grades PK-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between the visual arts and number concepts (July 2013).

Ward, R. *Put on Your Math Goggles!: Seeing Geometry in Art (Grades PK-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between the visual arts and geometry concepts (July 2013).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Discovering Number, Operation, and Algebraic Reasoning in the Visual Arts*. Rice University School Mathematics Project 2013 Summer Campus Program, Houston, TX. Engaged four cohorts of teachers of grades K-3, 4-6, 7-8, and 9-12 in integrated, literature-based, mathematics-visual arts activities (June 2013).

Ward, R. *Put on Your Math Goggles!: Seeing Mathematics in the Art of Paul Klee (Grades PreK-3)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between the visual arts and mathematics (October 2012).

Ward, R. (Invited speaker). *The Problem with Problem Solving (and the Suspension of Sense-Making)*. All Saints' Episcopal School, Fort Worth, TX. Discussed the steps to problem-solving and how to integrate problem-solving in the K-12 classroom (October 2012).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Discovering Geometry, Measurement, Data Analysis/Probability/Statistics in the Visual Arts*. Rice University School Mathematics Project 2012 Summer Campus Program, Houston, TX. Engaged four cohorts of teachers of grades K-3, 4-6, 7-8, and 9-12 in integrated, literature-based, mathematics-visual arts activities (June 2012).

Ward, R. *Using Base 10 Blocks to Teach Addition, Subtraction, Multiplication, and Division (Grades K-3)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in more deeply understanding the algorithms for addition, subtraction, multiplication, and division of whole numbers by using base 10 blocks. Explored alternative algorithms for the various operations (March 2012).

Ward, R. *Put on Your Math Goggles!: Seeing Number in Art (Grades PreK-2)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between number concepts and the visual arts (March 2012).

Ward, R. *Put on Your Math Goggles!: Seeing Number in Art (Grades 2-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between number concepts and the visual arts (March 2012).

Ward, R. *Put on Your Math Goggles!: Seeing Measurement in Art (Grades PreK-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between measurement concepts and the visual arts (January 2012).

Ward, R. (Invited speaker). *Put on Your Science Goggles! Connecting PreK-12 Science and the Visual Arts*. Fort Worth ISD, Fort Worth, TX. Engaged 180 PreK-12 art teachers in a variety of literature-based, hands-on activities demonstrating the connection between science concepts and the visual arts (November 2011).

Ward, R. (Invited speaker). *Get on Your Math Goggles!: Discover PreK-2 Mathematics in the Visual Arts*. Fort Worth ISD, Fort Worth, TX. Engaged 180 PreK-12 art teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (October 2011).

Ward, R. *Put on Your Math Goggles!: Seeing Geometry in Art (Grades PreK-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between geometry concepts and the visual arts (September 2011).

Ward, R. (Invited speaker). *Integrating Mathematics, the Visual Arts and Children's Literature in the PreK Classroom*. Everman ISD, Fort Worth, TX. Will engage 20 preK teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (August 2011).

Ward, R. *Put on Your Math Goggles!: Seeing Mathematics in Art (Grades PreK-2)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2011).

Ward, R. *Put on Your Math Goggles!: Seeing Mathematics in Art (Grades 2-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Engaged participants in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (July 2011).

Ward, R. (Invited speaker). *Put on Your Math Goggles!: Discovering Patterns, Number, and Algebra in Art*. Rice University School Mathematics Project 2011 Summer Campus Program, Houston, TX. Engaged four cohorts of teachers of grades K-3, 4-6, 7-8, and 9-12 in integrated, literature-based, mathematics-visual arts activities focusing on number sense and algebra (June 2011).

Ward, R. *Teaching Alternative Algorithms Using Base 10 Blocks*. All Saints' Episcopal School, Fort Worth, TX. Engaged participants in an exploration and discussion of using alternative algorithms in conjunction with base ten blocks (May 2011).

Ward, R. (Invited speaker). *Math Goggles: Viewing PreK Mathematics through the Lens of the Visual Arts and Children's Literature*. Everman ISD, Fort Worth, TX. Engaged 20 preK teachers in a variety of literature-based, hands-on activities demonstrating the connection between mathematics and the visual arts (May 2011).

Ward, R. (Invited speaker). *Math Goggles: Viewing the PreK-12 Curriculum Through the Lens of Mathematics*. All Saints' Episcopal School, Fort Worth, TX. Engaged 130 participants in innovative activities focused on how to integrate mathematics with other content areas (August 2010).

Ward, R. (Invited speaker). *Math Goggles: Encouraging Young Learners to See and Discover Mathematics in Their World*. All Saints' Episcopal School, Fort Worth, TX. Engaged participants in a discussion of the NCTM *Focal Points* for preK-kindergarten students (July 2010).

Ward, R. (Invited speaker). *Seeing Mathematics Through the Lens of the Visual Arts*. Rice University School Mathematics Project 2010 Summer Campus Program, Houston, TX. Engaged a cohort of K-3 teachers in integrated, hands-on, mathematics-visual arts activities whereby teachers explored geometry and probability concepts in the works of Andy Warhol and Hans Arp (June 2010).

Ward, R. (Invited speaker). *Seeing Mathematics Through the Lens of the Visual Arts*. Rice University School Mathematics Project 2010 Summer Campus Program, Houston, TX. Engaged a cohort of grades 4-6 teachers in an integrated, hands-on, mathematics-visual arts activity whereby teachers explored the golden spiral and the golden rectangle using the artwork of Henri Matisse (June 2010).

Ward, R. *Connecting Math and the Visual Arts*. The Shlenker School, Houston, TX. Provided professional development to Pre-K-5 teachers. Explored connections between and among mathematics, the visual arts, and children's literature (August 2009).

Ward, R. *Connecting Math and the Visual Arts*. Roberts Elementary School, Houston, TX. Provided professional development to Pre-K-5 and specialist teachers. Explored connections between and among mathematics, the visual arts, and children's literature (August 2009).

Ward, R. *Connecting Math and the Visual Arts*. Aldine School District, Houston, TX. Provided professional development to Pre-K-2 teachers. Explored connections between and among mathematics, the visual arts, and children's literature (August 2009).

Ward, R. (Invited speaker). *Exploring Geometry in the Visual Arts*. Rice University School Mathematics Project 2009 Summer Campus Program, Houston, TX. Engaged a cohort of K-3 teachers in integrated, hands-on, mathematics-visual arts activities whereby teachers explored geometry concepts in the works of Piet Mondrian (June 2009).

Ward, R. (Invited speaker). *Exploring Algebra in the Visual Arts*. Rice University School Mathematics Project 2009 Summer Campus Program, Houston, TX. Engaged a cohort of grades 4-6 teachers in an integrated, hands-on, mathematics-visual arts activity whereby teachers explored the mathematics of Alexander Calder's mobiles (June 2009).

Ward, R. *Using the Lens of the Visual Arts and Children's Literature to Explore PreK-2 Mathematics*. Mark Twain Elementary School, Houston, TX. Provided professional development to twenty K-2 teachers.

Explored connections between and among mathematics, the visual arts, and children's literature (April 2009).

Ward, R. (Invited speaker). *Developing Number Sense in Children*. West University Methodist Preschool, Houston, TX. Facilitated a one-hour discussion with preschool/PreK teachers articulating how to teach number sense to PreK children (October 2007).

Ward, R. (Invited speaker). *Best Practices in Mathematics Education Technology*. University of Arizona, Tucson, AZ. Engaged a cohort of K-12 teachers enrolled in a graduate level technology course in a one-hour demonstration of the variety and effective uses of mathematics education software and technology in the K-12 classroom (April 2005).

Ward, R. (Invited speaker). *Best Practices in Technology for Middle School Mathematics Teachers*. University of Arizona, Tucson, AZ. Designed and implemented a two-day workshop in which a cohort of K-8 preservice teachers explored a variety of mathematics software including *Tesselmania! Deluxe*, *Green Globes*, *Geometer's SketchPad*, and the Internet (July 2004).

Ward, R. (Invited speaker). *Effective Uses of Technology in the K-4 Mathematics Classroom*. Rogers Elementary School, Tucson, AZ. Designed and implemented a half-day technology workshop for local teachers to gain knowledge of and expertise with a variety of elementary level mathematics education software and technology (September 2003).

Ward, R. (Invited speaker). *Best Practices in Technology K-12 Mathematics Teachers*. University of Arizona, Tucson, AZ. Hosted four two-workshops that focused on demonstrating and informing K-12 preservice teachers of the variety and effective uses of mathematics education software and technology in the K-12 classroom (Fall 2003, Spring 2003, Fall 2002, Spring 2002).

Ward, R. (Invited speaker). *Exploring the Mathematics of NASA*. University of Arizona, Tucson, AZ. Hosted a workshop along with a NASA representative targeted at local K-12 inservice and preservice teachers showcasing the variety of services, workshops, professional development opportunities, and materials that are available to teachers from NASA to supplement and enhance their curriculum (2001, 2002).

Ward, R. (Invited speaker). *Math Phobia and Math Activities for K-12 Teachers*. NASA Dryden Science Ambassador Workshop, NASA Dryden Flight Research Center, Edwards Air Force Base, CA. Engaged K-12 teachers in discussions about mathematics phobia and then showcased a series of mathematics activities that might mitigate math phobia (September 2001).

Ward, R. (Invited speaker). *Making the Learning of Probability and Statistics More Meaningful and Fun*. Pima County Accommodation District, Tucson, AZ. Engaged twenty K-12 teachers in a variety of hands-on mathematics activities demonstrating how to effectively teach probability and statistics to students using manipulatives, concrete materials, and technology. Funded by an Eisenhower Grant awarded to Pima County (April, May 2001).

Ward, R. (Invited speaker). *Mathematics and the Arts*. Fresno State University, Fresno, CA. Engaged university-level faculty and exemplary K-12 teachers in a series of activities, which integrated mathematics and art. Sponsored by the California State University Summer Arts Program (June 2000).

SELECT SPEAKING ENGAGEMENTS (NON-CONFERENCES)

Ward, R. (Invited speaker; University of Texas OLLI-LAMP). *Put on Your Math Goggles!: Seeing Math in Art*, Austin TX. Engaged lifelong learners in an hour-long exploration of how to make the teaching and learning of mathematics more engaging by using the visual arts as a lens (March 2022).

Ward, R. (Invited speaker; Texas Cultural Trust). *How Arts Education Supports Social and Emotional Learning (SEL) and Academic Success: A Brief Overview*. Austin, TX. Delivered a brief overview of the research on how the arts and SEL impact academic success (April 2021).

Ward, R. (Invited speaker; Texas Cultural Trust). *How Arts Education Supports Social and Emotional Learning (SEL) and Academic Success: What the Research Tells Us*. Austin, TX. Discussed the research on how the arts and SEL impact academic success (December 2020).

Ward, R. (Invited speaker; Texas Higher Education Coordinating Board). *From STEM to STEAM: Integrating the Visual Arts into the Teaching of STEM*. Austin, TX. Discussed the research ramifications of transforming STEM into STEAM and engaged participants in hands-on, visual arts-based activities that embody mathematics, science, engineering, and technology (March 2014).

Ward, R. (Invited speaker). *Making the Teaching of Mathematics Engaging*. All Saints' Episcopal School, Fort Worth, TX. Discussed the most effective ways to teach mathematics, with a focus on problem-solving (October 2012).

Ward, R. (Invited key note speaker). *Finding Balance*. All Saints' Episcopal School, Fort Worth, TX. Explored the concept of balance via hands-on activities demonstrating the connection between mathematics and the visual arts (October 2011, 2014).

Ward, R. (Invited speaker). West University Elementary School Book Fair, Houston, TX. Facilitated a 90-minute discussion articulating choice selections of children's literature that feature mathematics (November 2006, 2007).

Ward, R. (Invited speaker). *When Are We Ever Gonna Have to Use This?* St Michael's School - Math Night, Tucson, AZ. Discussed the importance of mathematics in careers (November 2005).

Ward, R. (Invited speaker). San Diego State University/City Heights Educational Collaborative celebration, San Diego, CA. Spoke to a cohort of fifteen teachers graduating with a mathematics specialist certificate from San Diego State University about the ingredients of good mathematics teaching (July 2005).

SHORT COURSES

Ward, R. (Lead instructor). *Put on Your Math Goggles!* Summer mathematics camp. Fort Worth, TX. Designed and facilitated five one-week long camps for girls entering preK – grade 5. Engaged campers in hands-on explorations focused on number sense, geometry, measurement, data analysis, and probability using the visual arts (Summer 2016, 2017).

Ward, R. (Lead instructor). *Put on Your Math Goggles! Seeing Math in Art*. Rice University, Houston, TX. Designed and facilitated a six-week online course for K-4 teachers focused on integrating mathematics and the visual arts (Spring 2014, Spring 2015, Winter 2016, July 2016).

Ward, R. (Lead instructor). *Families of Functions Summer Mathematics Camp*. All Saints' Episcopal School, Fort Worth, TX. Designed and facilitated a one-week, half-day course for rising middle schoolers. Engaged campers in hands-on and technology-based explorations of linear, quadratic, cubic, and exponential equations (August 2014).

Ward, R. (Lead instructor). *Count on Us! Summer Mathematics Camp*. All Saints' Episcopal School, Fort Worth, TX. Designed and facilitated a one-week, half-day course for rising kindergartners. Engaged campers in hands-on explorations focused on number sense, geometry, measurement, data analysis, and probability (August 2010).

Ward, R. (Lead instructor). *Viewing Mathematics through the Lens of the Visual Arts*. Rice University School Mathematics Project, Houston, TX. Designed and facilitated a four-week course for PreK-2 teachers. Engaged participants in hands-on activities demonstrating the connection between mathematics, the visual arts, and children's literature (Spring 2009).

Ward, R. (Lead instructor). *Project BAM (Boys, Art, and Math)*. West University Methodist Preschool, Houston, TX. Designed and taught an integrated, literature-based, mathematics and art program for boys (Spring 2008).

Ward, R. (Lead instructor). *Project GEM (Girls Excelling in Math)*. West University Methodist Preschool, Houston, TX. Designed and taught an integrated, literature-based, mathematics and art program for young females (Fall 2007).

SELECT PREK-16 CLASSROOM WORK/WORKSHOPS

Ward, R. (Invited speaker). *Put on Your Math Goggles! Seeing Math in Art*. Engaged children at Helping Hands Home in integrated math-art activities (Summer 2022).

Ward, R. (Invited speaker). *Put on Your Math Goggles! Seeing Math in Art*. Engaged children at Foster Angels-Central Texas in integrated math-art activities (Spring, Summer 2022).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged three classes of third graders in an exploration of circles using the art of Wassily Kandinsky (October 2016).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged middle and high school geometry classes in an exploration of transformations using the tessellated artwork of M.C. Escher (February 2012, March 2014, March 2015, March 2016).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged second graders in an exploration of arrays and multiplication using the artwork of Andy Warhol (January 2016).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged second graders in an exploration of two- and three-dimensional shapes using the artwork of Pablo Picasso (December 2015).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged second graders in an exploration of fractions using the artwork of Paul Klee (March 2012, March 2013, January 2016).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged three classes of kindergarten in an exploration of counting and estimation using the art of George Seurat (September 2015).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged three classes of kindergarteners in an exploration of shape using the art of Wassily Kandinsky (May 2013, September 2015).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged four classes of algebra students in an exploration of linear equations using the art of Sol LeWitt (January 2015, January 2014).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged four classes of kindergarteners in an interdisciplinary exploration of art, mathematics, reading, and writing using the art of Franz Marc (January 2015, January 2014).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged four classes of kindergarteners in an interdisciplinary exploration of art, mathematics, science, reading, and writing using the art of Vincent van Gogh (January 2015, October 2014).

Ward, R. (Invited speaker). *Viewing Mathematics through the Lens of the Visual Arts*. Texas Christian University, Fort Worth, TX. Engaged a class of arts education majors in several integrated, hands-on, mathematics-visual arts activities. Modeled and discussed how to bring mathematics into K-12 art classrooms (2014, 2012, 2011, 2010).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged two classes of sixth graders in hands-on exploration of average, graphing, and box-and-whiskers plots (October 2014).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged second and third grade students in an integrated, hands-on, mathematics-science activity whereby students explored the size and scale of the solar system using playdoh and a *Project Astro* activity (2012, 2011, 2010).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged fourth and fifth grade classes in an exploration of line graphs using real-world data (April 2012, 2011).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged two classes of fifth graders classes in a hands-on exploration of integers (March 2012).

Ward, R. *Put on Your Math Goggles!: Seeing Measurement in Art (Grades 3-4)*. TCU's College of

Education, Andrews Institute, Fort Worth, TX. Third and fourth graders explored area and perimeter concepts by recreating works of art in the spirit of Piet Mondrian and Josef Albers. (March 2012).

Ward, R. *Put on Your Math Goggles!: Seeing Fractions in Art (Grades 3-4)*. TCU's College of Education, Andrews Institute, Fort Worth, TX. Third and fourth graders explored equivalent fractions and the addition/subtraction of fractions by recreating works of art in the spirit of Paul Klee and Wayne Thiebaud. (February 2012).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged a second and a third grade class in an exploration of fractions using the artwork of Wayne Thiebaud (April 2011, February 2012).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged a fifth grade class in a conceptual and pattern-driven exploration of operations on decimals (November 2012).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged a fifth grade class in a real-life exploration of exponents (October 2012).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged a fourth grade class in a geometric and algebraic exploration of angle measurement in polygons (March 2011).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged three PreK classes in an integrated mathematics-science-visual arts activity exploring the geometry of the constellations, the size and scale of the universe, and the earth-moon-sun motions (February 2011).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged second grade students in a hands-on, mathematics activity exploring probability concepts (February 2011).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged two classes of fourth grade students in a hands-on, mathematics activity conceptualizing the multiplication of fractions (January 2011).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged kindergarten students in an integrated, hands-on, mathematics-visual arts activities featuring the artwork of Jackson Pollock, Paul Cezanne, and Georges Seurat (October 2010).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged two classes of fourth grade students in a hands-on, mathematics activity featuring prime numbers (October 2010).

Ward, R. (Invited speaker). *Viewing Mathematics Using the Lens of the Visual Arts and Children's Literature*. Texas Christian University, Fort Worth, TX. Engaged two classes of PreK-6 preservice teachers in several integrated, literature-based, mathematics-visual arts activities (October 2010).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged two classes of third grade students in an exploration of alternative strategies to understanding multiplication using base 10 blocks (September 2010).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged first grade students in an integrated, hands-on, mathematics-visual arts activity featuring the artwork of Piet Mondrian (May 2010).

Ward, R. (Invited speaker). All Saints' Episcopal School, Fort Worth, TX. Engaged third grade students in an integrated, hands-on, mathematics-science activity whereby students explored the size and scale of the solar system using playdoh and a *Project Astro* activity (March 2010).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Engaged two classes of third grade students in an integrated, hands-on, mathematics-science activity whereby students explored the size and scale of the solar system using playdoh and a *Project Astro* activity (January 2009).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a first grade

teacher and implemented a literature-based, integrated, mathematics-visual arts lesson for a class of 22 Gifted and Talented students whereby students explored the artwork of Piet Mondrian and his use of quadrilaterals (January 2009).

Ward, R. (Invited speaker). Rice University Community Outreach Event, Houston, TX. Engaged twenty first-graders from Shadow Oaks Elementary in an integrated mathematics-art activity featuring squares and rectangles and the work of Piet Mondrian (April 2008).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a kindergarten teacher and implemented an integrated mathematics-social studies lesson featuring Earth Day and statistics to a class of 22 Gifted and Talented students. Students explored earth's land-water ratio via a hands-on, data collection activity (April 2008).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a kindergarten teacher and implemented a three-hour, literature-based, integrated, mathematics and science lesson for a class of 22 Gifted and Talented students. Students explored the mechanics of the sun-earth-moon system (February 2008).

Ward, R. (Invited speaker). West University Methodist Preschool, Houston, TX. Presented an interactive, literature-based, half-hour lesson to PreK students demonstrating the mechanics of a lunar eclipse (February 2008).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a kindergarten teacher and implemented a two-hour, integrated mathematics and art lesson for a class of 22 Gifted and Talented students. Students explored lines, squares, and rectangles while learning about and mimicking the artwork of Piet Mondrian (November 2007).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a kindergarten teacher and implemented a two-hour, integrated mathematics and science lesson for a class of 21 students. Students collected data and then created and analyzed bar graphs of the class' favorite season. Also used *The Graph Club* to generate and analyze bar graphs,. Students learned the science behind the seasons (April 2007).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a kindergarten teacher and implemented a two-day, two-hour, integrated mathematics and art lesson for a class of 21 students. Students explored the artistry of M.C. Escher's tessellations and learned the mathematics to creating such patterns (April 2007).

Ward, R. (Invited speaker). West University Elementary School, Houston, TX. Collaborated with a kindergarten teacher and implemented a two-day, two-hour, literature-based geometry lesson for a class of 21 students. Students explored and articulated the similarities and differences between shapes and solids and then went on a "shape hunt," identifying examples of real life shapes and solids on their school's campus (March 2007).

Ward, R. (Invited speaker). *The Global Village: Connecting Mathematics, Social Studies, and Literature*. San Diego State University, San Diego, CA. Taught a three-hour interdisciplinary lesson featuring children's literature to a graduate Language Arts Methods class (June 2006).

Ward, R., & Muller, D. (Invited speakers). Wilson Middle School, Tucson, AZ. Presented two, half-day explorations to a class of 24 middle school students studying algebra. Students discovered and explored the artistry of Alexander Calder's mobiles and learned how he used algebra, namely the Law of Levers, to balance his creations. Students then created their own Calder-like mobiles (December 2005).

Ward, R. (Invited speaker). *The Global Village: Connecting Mathematics, Social Studies, and Literature*. University of Arizona, Tucson, AZ. Designed and implemented a half-day activity in conjunction with a social studies clinical assistant professor in which K-8 teacher candidates explored real-world data included in the book, *If the World Were a Village* by David Smith. Coordinated and facilitated group activities encouraging students to brainstorm, estimate, graph, and interpret data (October 2003).

Ward, R. (Invited speaker). Booth Ficket Middle School, Tucson, AZ. Designed and implemented a half-

day mathematics activity for gifted 7-8th grade students in which they explored and designed fractals both manually and by using technology (October 2003).

Ward, R. (Invited speaker). *The Mathematics of NASA*. Edwards Air Force Base, Edwards, CA. As part of the "Math and Science Odyssey 2000" program sponsored by the NASA Dryden Flight Research Center and Antelope Valley College, engaged middle school students in a series of activities that reflect the mathematics used by NASA scientists (January 2000).

GRANTS AND CONTRACTS

Federal

Ward, R. Co-Principal Investigator (25%). Proposed a \$299,975 grant from the National Science Foundation entitled, "Rice University E-STEAM Camp for Middle School Students at Energy Institute High School." Grant will provide STEM experiences for middle school students (2018-2019).

Madden, D., McCallum, W., McGraw, R., & Ward, R. Co-Principal Investigator (10%). Awarded a \$5,000,000 grant from the National Science Foundation (NSF 0634532). Goal of grant is to partner with a local school district to develop and implement a vertically integrated, nationally replicable Arizona Teacher Institute which would result in the granting of a master's degree in middle school mathematics leadership, a certificate in mathematics teacher mentoring, and a postdoctoral fellowship in teacher preparation (2006).

Ward, R., & Romano, M. Co-Principal Investigator (20%). Awarded a \$665,358 three-year grant from the U.S. Department of Education entitled, "Preparing Tomorrow's Teachers to Use Technology." Grant provided for select University of Arizona College of Education faculty, teaching methods classes to preservice teachers, to be trained in the effective uses of technology. Also provided technology trainings for preservice and inservice teachers. Involved collaboration with three local school districts (2001-2005).

Johnson, V., Sabers, D., Bailey, R., Umashankar, R., & Ward, R. Co-Principal Investigator (5%). Awarded a \$98,626 planning grant from the National Science Foundation entitled, "Learning by Design: Integrating Preservice Teachers with the Assessment of Engineering Courses." Developed and implemented a program which provided experiences for K-12 preservice teachers to gain more knowledge of engineering concepts by assessing learning in an undergraduate engineering course. Collaborated with faculty from the University of Arizona's College of Education and the Department of Aerospace and Mechanical Engineering (2003-2004).

Ward, R. Principal Investigator (10%). Awarded a \$15,000 two-year grant from the NASA Dryden Flight Research Center entitled, "Integrating NASA Dryden Research Endeavors into the Teaching and Learning of Mathematics in the K-12 Classroom via the World Wide Web." Developed web-based mathematics lesson plans for K-12 teachers that showcase the mathematics used by scientists working on projects based at the NASA Dryden Flight Research Center. Activities are posted at: <http://www.ed.arizona.edu/ward/math-nasa.htm> (2000-2002).

Ward, R. (Principal Investigator (10%). Awarded a \$35,000 grant from the National Science Foundation (NSF 9850981). Established a mathematics education center at California Polytechnic State University used to improve the preparation of both pre-service and in-service teachers and serve as a model for Centers at other universities (1998-2000).

Biezd, D., & Ward, R. Co-Principal Investigator (10%). Awarded a \$50,000 one-year grant from the NASA Dryden Flight Research Center entitled, "K-12 Teacher Education with NASA Aeronautics Themes." Developed web-based mathematics lesson plans for K-12 teachers that showcase the mathematics used by scientists working on projects based at the NASA Dryden Flight Research Center. Activities are posted at: <http://www.ed.arizona.edu/ward/math-nasa.htm> (1998).

State

Ward, R. Co-Principal Investigator (25%). Awarded a \$762,500 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for Mathematics Teachers (Grades 1-12)." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2016-

2017).

Ward, R. Co-Principal Investigator (25%). Awarded a \$30,000 supplemental grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2014-2016).

Ward, R. Co-Principal Investigator (25%). Awarded a \$549,475 supplemental grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2014-2016).

Ward, R. Co-Principal Investigator (25%). Awarded an \$1,129,475 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2014-2016).

Ward, R. Co-Principal Investigator (16%). Awarded an \$550,000 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2014-2015).

Ward, R. Co-Principal Investigator (16%). Awarded an \$982,884 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2012-2014).

Ward, R. Co-Principal Investigator (25%). Awarded a \$432,957 supplemental grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2012- 2013).

Ward, R. Co-Principal Investigator (25%). Awarded a \$865,969 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2012-2013).

Ward, R. Co-Principal Investigator (16%). Awarded a \$433,012 supplemental grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will help increase the number of well-prepared, highly-effective mathematics teachers in HISD (2011-2012).

Ward, R. Co-Principal Investigator (25%). Awarded a \$124,400 supplemental grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will develop lead teachers in the area of mathematics (2010-2011).

Ward, R. Co-Principal Investigator (25%). Awarded a \$750,000 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for K-12 Mathematics Teachers." Program will develop lead teachers in the area of mathematics (2009-2011).

Ward, R. Co-Principal Investigator (15%). Awarded an \$87,000 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for Elementary School Teachers." Program will develop lead elementary teachers in the area of mathematics (2008).

Ward, R. Co-Principal Investigator (15%). Awarded an \$87,000 grant from the Texas Higher Education Coordinating Board entitled, "The RUSMP Program for Intermediate Teachers." Program will develop lead middle school teachers in the area of mathematics (2008).

Ward, R. Principal Investigator (10%). Awarded a three-year \$180,000 grant from the Arizona Board of Regents entitled, "Mentoring Development Project: Technology-Based Training for Cooperating Teachers." Designed, implemented, managed, and evaluated a technology-based mentoring training program for cooperating teachers (2003-2006).

Slater, T., Ward, R., & Johnson, B. Worked collaboratively with a faculty member from the University of Arizona's College of Education and from the Astronomy Department in completing work on a \$264,000 grant awarded by the Arizona Board of Regents (ABOR). Developed and delivered a web-based course focused on the uses of mathematics and science technology in middle and secondary classrooms (June 2003).

Ward, R. Principal Investigator. Awarded a \$2000 College of Education Research Facilitation Grant to carry out research investigating the use of representation in K-8 preservice teachers' mathematics and science lesson plans (May 2003).

Local

Ward, R. Research Evaluator (10%). Lead research evaluator for the 2010 Project GRAD/Rice University Advanced Summer Mathematics Institute. \$74,000 grant funded by Shell Oil (June 2010).

Ward, R. Research Evaluator (10%). Lead research evaluator for the 2009 Project GRAD/Rice University Advanced Summer Mathematics Institute. \$57,000 grant funded by Shell Oil (June 2009).

Ward, R. Research Evaluator (10%). Lead research evaluator for the 2008 Project GRAD/Rice University Advanced Summer Mathematics Institute. \$100,215 grant funded by Shell Oil (June 2008).

TRADEMARKS AND PATENTS

Creator and owner of *Math Goggles*; US Trademark Serial No. 85856090 (2014)

Creator and owner of *GEMS (Girls Excelling in Math and Science)* - math and science camps for girls; US Trademark Serial No. 85181978 (2011)

Creator and owner of *GEM (Girls Excelling in Math)* - math camps for girls; US Trademark Serial No. 77260057 (2009)

HONORS AND AWARDS

Named as "Outstanding Mother" at the 2015 *Hats Off to Mothers Luncheon* sponsored by Easter Seals (2015)

Named to *Who's Who in America* (2015)

Names as Honorary Chair, Leapfrog Committee, Kinderfrogs School, Fort Worth, TX (2012)

Nominated for the Immaculata University Alumni Association Amethyst Award (2011)

Named to the *National Association of Professional Women* (2011)

Named to the *National Register's Who's Who in Executives and Professionals* (2004, 2011, 2014)

Honored panelist at the Rice University 2008 Friends of Fondren Library Authors Reception (February 2009)

Honored as a Rice University author at the 2007 Friends of Fondren Library Authors Reception (February 2008)

Named to *Who's Who in Education* (2003-2008)

Named as the University of Arizona College of Education's Outstanding Teacher (2005)

Invited special guest at the launch of the Space Shuttle *Discovery* (December 1999)

Ward, R. Web site (<http://www.ed.arizona.edu/ward/math-nasa.htm>) chosen as a "Network Nugget Selection" by the *Community Learning Network* (November 1999).

Ward, R. Web site (<http://www.ed.arizona.edu/ward/math-nasa.htm>) named as one of the "best educational resources" by *StudyWeb* (October 1999)

Ward, R. Web site (<http://www.ed.arizona.edu/ward/math-nasa.htm>) named as one of June's "Digital Dozen" by the *Eisenhower National Clearinghouse for Mathematics and Science Education* (June 1999)

Ward, R. Web site (<http://www.ed.arizona.edu/ward/math-nasa.htm>) featured as one of the National Council of Teachers of Mathematics (NCTM) *Web Bytes* in its monthly newsletter (March 1999)

Ward, R. Web site (<http://www.ed.arizona.edu/ward/math-nasa.htm>) named as one of the "Best of February" web sites by *Education World*, assigning the site a score of A+ (February 1999)

Recipient of a \$10,000 NASA-ASEE Summer Faculty Fellowship (1998, 1999)

Nominated as *Cal Poly Faculty Woman of the Year* (February 1999)

Named as a lead technology specialist by the National Council of Teachers of Mathematics (NCTM) *Standards 2000* Writing Group, Alexandria, VA (June 1998)

PARTICIPATION IN PROFESSIONAL DEVELOPMENT COURSES

Kandinsky, Klee and Mondrian: Using Abstract Art to Teach Geometric Concepts and Fractions (Grades 6-8), webinar offered by NCTM (July 2020)
Arts Integration and STEAM in Early Childhood, webinar offered by EducationCloset (February 2015)
Arts and Inquiry: Museum Teaching Strategies for your Classroom, Coursera online course offered by the Museum of Modern Art (April 2014)

BOARDS/SERVICE

Glow in the Park Advisory Board, Austin TX (2022)
Foster Angels of Central Texas Community Advisory Board (2021-present)
Helping Hands Home Community Advisory Board (2021-present)
Texas Cultural Trust Arts Education Task Force (2019-present)
University of Texas Neighborhood Longhorns Program (2019-present)
University of Texas Fine Arts Advisory Council (2019-present)
University of Texas Libraries Advisory Council (2018-present)
University of Texas Campus Beautification Council (2018-present)
Member, TCU College of Science and Engineering External Advisory Board (2016-2019)
FAME (Fine Arts Matter in Education) committee member, All Saints' Episcopal School, Fort Worth, TX (2015-2018)
Volunteer at SafeHaven Women's Shelter, Fort Worth, TX (2014–2016)
Volunteer Educational Consultant at Educational First Steps, Fort Worth, TX (2014–2018)
Honorary Chair, *KinderFrogs* Fundraising Event, Fort Worth, TX (2013)
MathCounts Advisory Board, All Saints' Episcopal School, Fort Worth, TX (2012-2014)
Educational Advisory Committee, The Hill School, Fort Worth, TX (2012-2018)
Mathematics Curriculum Committee, All Saints' Episcopal School, Fort Worth, TX (2011-2018)
Parent Ambassador, All Saints' Episcopal School, Fort Worth, TX (2011-2018)
VP Curriculum Enrichment, West University Elementary School PTO (2009-2010)
University of Arizona Teacher Institute (2006)
St. Mark's Preschool Advisory Board, Tucson, AZ (2005-2006)
University of Arizona Task Force on Core Mathematics at the University of Arizona (2005-2006)
University of Arizona Noyce Scholarships Advisory Board (2005-2006)
University of Arizona Steering Committee for Mathematics Educator Appreciation Day (2005)
Pima County Mathematics Advisory Board, Tucson, AZ (2004-2006)
University of Arizona Science and Mathematics Education (SAMEC) Advisory Board (2004-2006)
Technology consultant at Anne E. Rogers Elementary School, Tucson, AZ (2003-2004)
Arizona Scholarship Committee of the National Board Certification for K-12 Teachers (2002-2006)
University of Arizona College of Education representative for the Southeast Consortium for Minorities in Engineering (SECME) Summer Institute (July 2001)

REVIEWER/CONSULTANT

Co-Editor, "For the Love of Mathematics" department in *Mathematics Teacher: Learning and Teaching PK-12*, published by NCTM (2020-present)
Associate Editor, *The Charter Schools Resource Journal* (2016-2020)
Reviewer, *The African Educational Research Journal* (2015-2016)
Mathematics Consultant, Educational First Steps (2014-2018)
PreK-12 Mathematics Consultant, All Saints' Episcopal School (2010-2018)
Reviewer, *Asia-Pacific Education Researcher* (2013-2015)
Reviewer, Merrill Prentice Hall publications (2007-2008)
Endorser, *Teaching and Literacy through the Arts* by N. L. McDonald and D. Fisher, Guilford Publications (2006)
Reviewer, *After Math and Ten Ways to Count to One* by R.G. Levings (2006)
Reviewer, *U.S. Dept. of Education on Teacher Education Programs and Technology Survey* (2005)
Reviewer, Addison-Wesley publications (2004-2006)
Reviewer, *Eye on Education Annual*, published by The National Council of Teachers of Mathematics (2002)
Reviewer, *Computers & Education* (2001-2003)
Reviewer, *FOCUS on Learning Problems in Mathematics*, published by The Research Council for Mathematics Learning (RCML) (1999-2004)

Reviewer, *Teaching Children Mathematics*, *Mathematics Teaching in the Middle School* and the *Mathematics Teacher*, published by The National Council of Teachers of Mathematics (NCTM) (1999-2005)

MEMBERSHIPS

Kimbell Art Museum (2007-2018)

The Modern Art Museum of Fort Worth (2007-2018)

Kindergarten Teachers of Texas (2009–2012)

Texas Council of Teachers of Mathematics (TCTM) (2009–2013)

National Council of Teachers of Mathematics (NCTM) (1997-present)

Association for Women in Mathematics (1998-2000, 2005-2007)

Research Council on Mathematics Learning (RCML) (1997-2006)

Women in Mathematics Poster Group (2005-06)