

Ohio Journal of School Mathematics

Spring 2009



Number 59

OHIO COUNCIL OF TEACHERS OF MATHEMATICS

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- 3 Editorial: A Call for Dynamic Visualizations in Teaching Algebra
Ed Laughbaum, The Ohio State University

This article is a call for teachers to use visualization properly when teaching concepts and procedural skills. A rationale based in research by neuroscientists on basic brain function is proposed. The purpose is to enhance understanding and create long-term memory with improved recall.

- 6 A Historical Excursion: Carlyle's Geometric Solution to the Quadratic Equation
Ted Hodgson, Northern Kentucky University; **Joe Gore**, Valdosta State University

A study of the history of mathematics offers rich learning opportunities for students. In this article, we present a process for constructing geometric solutions to the quadratic equation that was developed by one 19th century mathematics *student* (Thomas Carlyle). In particular, Carlyle discovered that the x -intercepts of a particular circle (which we define as the Carlyle circle) corresponds to the solutions of quadratic equations of the form $x^2 + bx + c = 0$. With advances in technology, Carlyle's geometric solution to quadratics could now be considered an historical curiosity. As this article demonstrates, however, Carlyle's solution offers an effective context for deepening and connecting students' understanding of both algebra and geometry.

- 13 Helping Students Connect Concepts of Fractions and Decimals
William B. Weber, The University of Toledo

Two of the most difficult topics for students in upper elementary, middle, and high school to understand are fractions and decimals. Students have difficulty with computational procedures and learning the fundamental concepts. Using a model developed by Payne, Towsley, and Huinker (1990) as a framework, students can make connections between the different representations of fractions and decimals. The use of TI-Explorer calculators is examined as a way to help students develop a deeper understanding of both fractions and decimals.

- 17 2009, A Special Year
James E. Schultz, Professor Emeritus, Ohio University

The article describes a special property of the number 2009, the first year to have this property in over 700 years. Ideas in the article may be a useful idea to share with students as an illustration of how numbers can have interesting properties, as a convenient tool for mental arithmetic, as an example of representing something in more than one way (an area

model and an algebraic proof), and as a way of showing the importance of meeting required conditions when drawing a conclusion.

- 21 **FARM-(INFO) WEEK: How Mathematics is Used in Agriculture**
Steve Lifer, Lexington High School

Farm-Fo (short for Farm-Information) is a week spent in a Geometry class relating how mathematics is utilized in the agricultural industry. The lessons could be used in any math course from 7th to 10th grade where students apply mathematical knowledge to a real setting. Enthusiasm for any particular passion or hobby, regardless of the subject matter, can be implemented in a similar manner. Teachers who can show their students a true appreciation of applied problems and bestow a true love of mathematics can accomplish much in the area of math instruction.

- 25 **Get the point? Developing Teachers' Understanding of Real Numbers**
Patrick W. Wachira, Cleveland State University

This paper describes an activity for prospective middle and high school mathematics teachers. The notion of big idea is used to engage teachers in hands-on activities designed to guide them to discover the placement of rational and irrational numbers on the number line to illustrate that both rational and irrational numbers are real numbers.

- 29 **An Example of Professional Staff Development in an Urban Setting**
Honi J. Bamberger, R. Michael Krach, Judith Macks, Todd Moyer, Felice Shore,
Towson University

The article shares what the authors learned after considering student-created concept maps and what they revealed about function understanding. The students in this project were preservice teachers preparing for middle grades certification in mathematics. Examples of student maps are shared and the understanding of function revealed in the maps is related to the formal definition of function.

- 37 **Opportunities with Pascal's Triangle (Mathematics Contest Corner)**
T. Michael Flick & Debora Kuchey Xavier University

- 41 **And the Answer is ... (Activity)**
Tim Tilton, Winton Woods High School

- 45 **The Mathematical Word Wall (Activity)**
Kimberle Kembitzky, Hilliard Davidson High School