

## **Mathematical Connections**

# **Guidelines for Manuscripts**

delta-K is a professional journal for mathematics teachers in Alberta. It is published twice a year to

- promote the professional development of mathematics educators and
- stimulate thinking, explore new ideas and offer various viewpoints.

Submissions are requested that have a classroom as well as a scholarly focus. They may include

- personal explorations of significant classroom experiences;
- descriptions of innovative classroom and school practices;
- · reviews or evaluations of instructional and curricular methods, programs or materials;
- · discussions of trends, issues or policies;
- a specific focus on technology in the classroom; or
- a focus on the curriculum, professional and assessment standards of the NCTM.

## **Suggestions for Writers**

- 1. *delta-K* is a refereed journal. Manuscripts submitted to *delta-K* should be original material. Articles currently under consideration by other journals will not be reviewed.
- 2. If a manuscript is accepted for publication, its author(s) will agree to transfer copyright to the Mathematics Council of the Alberta Teachers' Association for the republication, representation and distribution of the original and derivative material.
- 3. Peer-reviewed articles are normally 8-10 pages in length.
- 4. All manuscripts should be typewritten, double-spaced and properly referenced. All pages should be numbered.
- 5. The author's name and full address should be provided on a separate page. If an article has more than one author, the contact author must be clearly identified. Authors should avoid all other references that may reveal their identities to the reviewers.
- 6. All manuscripts should be submitted electronically, using Microsoft Word format.
- 7. Pictures or illustrations should be clearly labelled and placed where you want them to appear in the article. A caption and photo credit should accompany each photograph.
- 8. References and citations should be formatted consistently using *The Chicago Manual of Style's* author-date system.
- 9. If any student sample work is included, please provide a consent form from the student's parent/guardian allowing publication in the journal. The editor will provide this form on request.
- 10. Letters to the editor, description of teaching practices or reviews of curriculum materials are welcome.
- 11. Send manuscripts and inquiries to the editor: Lorelei Boschman, c/o Medicine Hat College, Division of Arts and Education, 299 College Drive SE, Medicine Hat, AB T1A 3Y6; e-mail lboschman@mhc.ab.ca.

#### **MCATA Mission Statement**

Providing leadership to encourage the continuing enhancement of teaching, learning and understanding mathematics.



Volume 55, Number 1

From the Editor's Desk

## CONTENTS

**CONVERSATION STARTERS: ISSUES IN THE FIELD** Developing a Passion for Mathematics Through History 4 Armand Doucet and Jata MacCabe **PROBLEM-SOLVING MOMENT** Lorelei Boschman **Open-Ended** Questions 8 **RESEARCH ARTICLE** Intersections in Reasoning Within Science and Mathematics 9 Ashley Pisesky, Janelle McFeetors and Mijung Kim **TEACHING IDEAS** Leibniz's Heuristic Derivation of the Product Rule and Quotient Rule 19 Indy Lagu Backing Up and Moving Forward in Fractional Understanding 21 Angela T Barlow, Alyson E Lischka, James C Willingham and Kristin S Hartland 27 Sarah B Bush. An Architecture Design Project: Building Understanding Judith Albanese, Karen S Karp and

#### Contents continued on page 2

Copyright © 2018 by The Alberta Teachers' Association (ATA). 11010 142 Street NW, Edmonton, AB T5N 2R1. Permission to use or to reproduce any part of this publication for classroom purposes, except for articles published with permission of the author and noted as "not for reproduction," is hereby granted. *delta-K* is published by the ATA for the Mathematics Council (MCATA). EDITOR: Lorelei Boschman, e-mail lboschman@mhc.ab.ca. EDITORIAL AND PRODUCTION SERVICES: Document Production staff, ATA. Opinions expressed herein are not necessarily those of MCATA or of the ATA. Address correspondence regarding this publication to the editor. *delta-K* is indexed in CBCA Education. ISSN 0319-8367

Individual copies of this journal can be ordered at the following prices: 1 to 4 copies, \$7.50 each: 5 to 10 copies, \$5.00 each; more than 10 copies, \$3.50 each. Please add 5 per cent shipping and handling and 5 per cent GST. Please contact Distribution at Barnett House to place your order at distribution@ata.ab.ca.

Personal information regarding any person named in this document is for the sole purpose of professional consultation between members of The Alberta Teachers' Association.

### June 2018

Lorelei Boschman

Matthew Karp

3

Instruction and Learning Through Formative Assessments	35	Michael J Bossé, Kathleen Lynch-Davis, Kwaku Adu-Gyamfi and Kayla Chandler
MATH COMPETITIONS		
Alberta High School Mathematics Competition 2016/17	41	
Calgary Junior High School Mathematics Competition 2016/17	49	
Edmonton Junior High School Mathematics Competition 2016/17	56	
BOOK REVIEW		
Mathematical Mindsets, by Jo Boaler	62	Ashley Durbeniuk and Terry Freeman
WEBSITE HIGHLIGHT		

Mathematics of Planet Earth

63 Lorelei Boschman