

The Research Council on Mathematics Learning seeks to stimulate, generate, coordinate, and disseminate research efforts designed to understand and/or influence factors that affect mathematics learning.

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PRESIDENT'S COLUMN

Bea Babbit, President

"Changing Perspectives"

Have you ever stood on a hill or flown over a familiar landmark to view it in a new way? When you do so you will often make remarks such as "oh, I didn't realize it was that large" or "it looks so different from this vantage point." Two items hit me that way in the last couple months.

First, as a member or an organization one tends to take the operation of the organization for granted. As an officer, you realize that people doing tasks in a timely fashion actually keep an organization on target. Hence, even though our February conference seems a long way off, certain actions must be completed shortly. This is your yearly reminder that according to Article VII of the Constitution, "Amendments to the Constitution can be submitted to the Executive Committee, [by any regular member], not less than sixty days prior to the annual business meeting.

These proposed amendments shall be considered by the Executive Committee with recommendations to the regular members at the annual meeting." Similarly, according to Article VI of the By-Laws, "The Executive Committee shall distribute in writing all proposed amendments to the By-Laws together with its recommendations for approval or rejection to the regular members not less than thirty days prior to the annual business meeting of the Council." This means suggestions for bylaws changes should be sent to me by early December so the Executive Committee would have the opportunity to review them and make recommendations to the members in accordance with our Constitution and By-laws.

My second new view of a familiar world came on August 1st of this year, as I took on a new position as Interim Director of

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Academic Assessment for UNLV. Instead of focusing on the work of my department (Special Education) and college (Education), I am now looking across programs and colleges at the university. In particular, I am reviewing the learning outcomes and assessment plans of over 230 programs serving over 25,000 students at UNLV. In addition, I am reviewing these same definitional and assessment efforts at institutions of higher education across the country in search of examples of best practice. The efforts to define learning outcomes and implement assessment plans are motivated by higher education regional accreditation bodies and internal self-improvement efforts of higher education institutions.

So what are my initial perceptions of this new view of higher education? Frankly, I am surprised at the difficulty the math and science community is having with defining learning outcomes and developing programmatic assessments. Having experienced the conversations surrounding the NCTM Standards for over 16 years, it is difficult to imagine a mathematician who has escaped its influence. Having worked in a College of Education where all syllabi are required to list the learning outcomes (objectives) for each course, I simply assumed that all fields of study had clearly defined what they wanted students to know and be able to do. Instead, I have found, that this is a new endeavor for many faculty members. I've been particularly surprised to discover math and science departments in higher education struggle with defining learning outcomes. In some cases the outcome is assumed to be obvious, "students need to know calculus" as if all mathematicians would automatically agree on what it means to be proficient in calculus. In other cases, defining outcomes is thought to be impossible, "the field of physics is so complex there is no way to define what students should know." In some cases the responses are consistent with the Standards, "students need to be able to problem solve," but ignore the need to differentiate the problem solving expectations for college students versus high school

students, for example. While some of these comments may reflect resistance to what may be considered another administrative task, I believe many math and science faculty in higher education have not yet made the shift from "this is what I teach" to "this is what I expect students to learn." I am sure RCML members may have other hypotheses about this issue.

On the positive side, I am finding that when I sit down and converse with scientists and mathematicians and ask focused questions about what students should know, they can usually begin to reach agreement on the major content to be learned along with the major skills that they expect students to demonstrate. Through responding to questions such as "what would you expect of your graduate students that goes beyond what you expect of undergraduates", they are also able to differentiate outcomes across academic levels. The process is time intensive and requires thought and debate among program faculty. In the end, it is hoped that faculty will define learning outcomes that can be understood by themselves, by their students, and by other interested parties. Perhaps some RCML members have been part of these conversations at their colleges or universities.

I started by saying that looking at something familiar from a new perspective often provides new insights. I'm hoping that you'll give me your perspectives on defining and assessing learning outcomes in mathematics for higher education at the RCML Conference in Las Vegas in February.

Research Council on Mathematics Learning
Thirty-Third Annual Conference
Las Vegas, Nevada
February 23-25, 2006

We are looking forward to welcoming you to the thirty-third annual RCML conference. There is something special about the RCML conference- an opportunity to meet together with colleagues to share and grow professionally. And what better place for mathematics educators to gather than Venice, Rome, Italy, or France? Of course, you have all of these options in Las Vegas, as well as the newly built 2.7 billion (yes, that's a "b") dollar Wynn Hotel.

We will have over sixty sessions and expect over one hundred attendees at the conference. After an opening speaker on Thursday late afternoon, conference attendees will fully experience the Las Vegas Gaming Institute, participating in games of chance for fun and prizes (and honing your skills for later). At what other conference do you get to gamble alongside a RCML Founding Member? Friday will include our Business meeting luncheon and Wilson Memorial Speaker, while Saturday will highlight incoming **NCTM President Skip Fennell**, who will give the Heddens Founder Lecture on what it REALLY means to be a "highly qualified teacher, student, and parent."

Information about registration is located at the RCML web site (<http://www.unlv.edu/RCML>).

Hotel accommodations can be made by contacting the AmeriSuites Hotel (<http://www.amerisuites.com/reservations/locationdetail.asp?facid=4032>; phone: 702-369-3366). The hotel is located at 4520 Paradise Road on the western border of the UNLV campus (and just across the street from the Hard Rock Hotel).

We plan to continue the soliciting of exemplary papers for awards and possible publication in our journal. Award categories are the same as before: Most Outstanding Young Career Research, Most Outstanding Empirical Research, and Most Outstanding Historical/Theoretical Research. Full papers are due by January XX, 2006.

We are extremely excited about the conference and hope to see you in Las Vegas. We are hoping our conference plays out, as our organization has evolved, as an opportunity to visit our past and mentor the next generation of outstanding mathematics educators for the future. See you in February when we can all try to make sure that: **What happens in Las Vegas at RCML, doesn't stay in Las Vegas.**

– Jeff Shih

Slate of RCML Candidate for Offices (2006-2008/09)

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(2006-2009)

Conference Committee 1: Frances Thompson and Stacy Reeder
Conference Committee 2: Keith Adolphson and James Telese

Read their biographies online: www.unlv.edu/RCML

Points of Puzzlement

by Michael Naylor

Last issue's puzzle: **MIDPOINTS AND GRIDPOINTS** is as follows: How can 5 points be placed on a square lattice so that no midpoints between any pair of points lies on a lattice point?

The puzzle was solved by Melfried Olson and Bob Quinn: it is impossible. Bob explains that there are four possibilities for the coordinates of the points on the grid: (even, even), (odd, even), (even, odd), and (odd, odd). Any two points having the even/odd configuration will have a midpoint that lies on a lattice point. As Melfried points out, you've been pigeon-holed out of a 5 point solution.

Each of this issues winners will be receiving a big box full of intrinsic rewards. Well done!

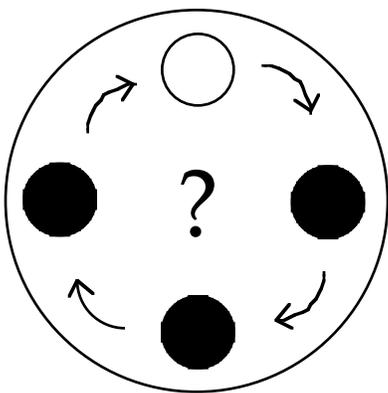
This week's puzzle takes a minute to get the hang of, but you'll find it delightfully puzzling and worth the effort.

HOCKEY PUCK MIND EXPERIMENT

Imagine a circular table which can spin in place. 4 pockets are equally spaced around the edge, and in each pocket there is a hockey puck which is white on one side and black on the other. You can't see the hockey pucks but they're either white side up or black side up, and you'd like to flip them so they all have the same color facing up.

You may reach into two pockets at the same time and pull out two pucks, look at them, flip them however you like, and then return them to their pockets. Now here's the catch: the table is spun, and you now you don't know which pockets are which. Once again you can choose two pockets, pull out two pucks at the same time, set them either side up, and the table is again spun. The game ends when all four pucks are either all white- or all black-side up.

Is it possible to guarantee a solution in a finite number of turns, or is might it be that if you were terribly unlucky you might never succeed?



Email your solution to mnaylor@cc.wvu.edu. Best solutions win valuable intrinsic rewards.

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