



FALL 1999

# IMPressions

A NEWSLETTER ABOUT THE INTERACTIVE MATHEMATICS PROGRAM®

## IMP Receives Exemplary Award from the U.S. Department of Education

On Oct. 6th, Assistant Education Secretary Kent McGuire announced the selection of 10 mathematics education programs as exemplary and promising. The K-12 programs were chosen for their outstanding quality and demonstrated effectiveness, following a national search.

Five of the programs, including *IMP*, were designated “exemplary” because they provided convincing evidence of their effectiveness in multiple sites with multiple populations. “The exemplary programs have met the highest standards set by our nation’s leading mathematics experts and educators,” McGuire said. “These programs work, and we encourage teachers, administrators, and policymakers to learn more about them as potential additions to their curriculum.”

The search for quality mathematics programs began in 1994 when Congress directed the department’s Office of Educational Research and Improvement to establish “panels of appropriate qualified experts and practitioners” to evaluate educational programs and recommend the best to the secretary of education. The Expert Panel in Mathematics and Science is comprised of 15 mathematicians, scientists, educators, and policymakers from around the country.

The expert panel began its search by assessing the status of mathematics education in the U.S. Their study showed that 43 states have adopted or substantially incorporated recommendations from the national standards documents into their own standards and curriculum frameworks.

The panel also found that educators are seeking curriculum materials and programs that translate the standards into a useful form for their classrooms. Consequently, the panel

decided to focus its first year’s search on programs that exemplify the standards set by the National Council of Teachers of Mathematics and the American Association for the Advancement of Science benchmarks.

*Exemplary & Promising Mathematics Programs* provides additional information about the 10 programs identified for recognition in 1999. For copies of the publication, call 1-877-4ED-PUBS (1-877-433-7827). Full text of the publication is also available on the web at [www.enc.org/ed/exemplary/](http://www.enc.org/ed/exemplary/).

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PUBLISHED BY

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Innovators in Mathematics Education

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### A special message from Columbine High School

*“As the IMP teachers at Columbine High School, we would like to thank IMP-RMR, Key Curriculum Press, and all the IMP teachers and staff across the nation for their support, thoughts, and prayers.*

*Unfortunately, three of the students killed were IMP students. As you know, we as teachers get to know our IMP students really well and so this—along with losing one of our colleagues—made this tragedy especially difficult. IMP-RMR called immediately with the offer of supplies and help to start school again at Chatfield. We feel that all members of IMP-RMR are like family—the cards, phone calls, offers of support and prayers were constant and greatly appreciated in the weeks following the shootings. When we started school at Chatfield, Key Curriculum had IMP textbooks there for us. IMP-RMR provided many of the supplies and manipulatives we would need to finish the school year.*

*Even though school was quite different at Chatfield, having the familiar books and materials was comforting to our students and us. We are thankful for all of the wonderful people in the world who help us to remember that people like the shooters are very few.”*

*Thank you,  
The Columbine IMP teachers  
Lori McMullen, Gretchen Hazelwood, Michelle Dimanna,  
Shawn Tank, and Ray Bundy*

# IMP™ students score higher than their peers on SAT-9.

*Sylvia Turner, mathematics department chair, Lincoln High School, Stockton, CA*

In the fall of 1989, the mathematics department at Lincoln High School began searching for a different approach to mathematics. The traditional approach of the past had not provided a pathway to mathematics for enough of our students. With the attrition rate high in our courses and frustration rising among some of our teachers, the quest began.

We applied, and were accepted, to become a pilot school for the *Interactive Mathematics Program*®. The impact on our department and school has proven to be beyond our hopes and expectations. The number of students enrolled in a 4th year of mathematics for the fall of 1999 is five times greater than it was just four years ago. In the past we would commonly encounter students in our courses that liked our class but hated math. It is now typical to have students that love mathematics and want to pursue it in college.

We have had the time and support to get this curriculum up and running with a strong cohort of fully trained IMP teachers. It is now time to take a close look at the statistics.

The California State Board of Education is pressuring schools to raise their expectations of students. They are holding us, as teachers and administrators, accountable for the performance of our classes on the Stanford Test of Academic Skills (SAT-9). The augmented portion of this test addresses the additional standards mandated by the California State Board of Education. Therefore, we have chosen to use these tests as one of our measures. The results follow.

One question we asked was whether the IMP student average on the 9th grade SAT-9 was significantly higher than the Non-IMP student average. Since all students in IMP during their 9th grade year are at grade level or higher, they were compared to 9th grade students in Algebra 1 or higher.

9TH GRADE STUDENTS	AVERAGE RAW SCORE
IMP Students	36.06
Algebra 1/Geometry Students	26.50

A test of significance shows that this difference is significant at the less than 1% level.

We also wanted to know what happens as the years progress. As the students experience the two math programs at our school, do some become better thinkers, better scientists, better writers? These are all questions the department has wondered about, and while the IMP teachers have had a sense that the IMP students were developing skills not tested on the mathematics assessments, we have not had the opportunity to look at the data until now.

The SAT-9 and STAR results for the 1998-99 junior class at Lincoln High School were analyzed next. No one was dropped from the averages for any of the tests. This is due to the comparable mix of students as shown above.

STUDENTS	IMP (N = 125)	Non-IMP (N = 373)
% on grade level	51.4%	45.6%
% honors	18.2%	22.8%
% below grade level	30.4%	31.6%

Following are the results on all of the SAT-9 and STAR tests:

SAT -9 Test	IMP Students	Non-IMP Students
SAT Math	28.87	22.12
SAT Reading	65.65	55.56
SAT Language	34.30	29.00
SAT Language Expressions	17.75	14.96
SAT Science	22.20	18.63
SAT Social Science	22.95	19.08
STAR	22.72	18.11

Each of the above tests show significance at less than 1% and they confirm our hypotheses. We were especially pleased with the STAR or the California Mathematics Content Standards. The Lincoln High School Junior class was ranked in the top 10% for their STAR mathematics results on the Mathematically Correct website. It appears that IMP students' success on this skill-driven test had much to do with Lincoln High School's outstanding ranking.

*Sylvia Turner is the mathematics department chair at Lincoln High School. She has been teaching IMP for eight years. She is currently teaching IMP 3, IMP 4, and AP Statistics.*

## IMP prepares students for International Baccalaureate degree

The IMP curriculum provides an ideal preparation for the International Baccalaureate (IB) examination and certification program, as IMP students in the Midwest Region are proving.

The International Baccalaureate Program originated in Geneva, Switzerland. An IB diploma earns students admission to most universities in the world and sophomore standing at many US colleges and universities.

Mathematics is one of six subjects required for the IB Diploma. Because it's European, the exam focuses on a mathematics syllabus with an integrated approach much like IMP's in which the different strands of mathematics are taught every year, investigations with oral and written exposition are required, and "ways of knowing" are emphasized.

IB students at Patrick Henry High School in Minneapolis take IMP Years 1, 2, and 3, then an IB Math Studies class in their senior year. This class is a mix of IMP students and students who took geometry as freshmen and then Algebra 2 and Math Analysis.

Last year the IMP students outperformed their "accelerated" counterparts on the Math Studies exam. At Southwest High School during 1997, all but one of the IMP Year 4 students took and passed the IB Math Studies examination.

The IB mathematics assessment program in the senior year requires either a student research project or a portfolio of problem-solving projects. The final examinations consist of open-ended questions plus a major problem that must be written up in detail.

For more information on IMP and the IB program contact Ed Andersen at eandarse@mpls.k12.mn.us.

# Professional development opportunities for *IMP*<sup>™</sup> teachers during the 1999–2000 school year

Anyone involved with systemic mathematics reform, including *IMP* teachers, has realized the importance of professional development. The regional *IMP* centers around the country are committed to providing continual, on-going staff development opportunities for *IMP* teachers during this upcoming school year.

California will conduct *IMP 1, 2, 3,* and *4* training as a follow-up to the summer training with emphasis on the last two units of each year. Those trainings will be conducted in Northern California in Berkeley on January 19–21. The Southern California training will occur in Oxnard on February 2–4.

**Colorado's professional development schedule is listed below:**

August 23	Weekly visitations begin
September 27–28	<i>Year 1</i> Immersion
October 15–16	CCTM
November 13	Gathering—All <i>IMP</i> Participants
January 28–29	Advisory Board Meeting
February 12	Gathering—All <i>IMP</i> Participants
April 29	Gathering—All <i>IMP</i> Participants

**Chicago offers quite an extensive list of workshops and networking opportunities:**

October 29–30	Overland Trail, 8:30–3:00, <i>IMP 1</i>
October 29–30	Do Bees build It Best? 8:30–3:00, <i>IMP 2</i>
February 5	The Pit and the Pendulum, part 1, 8:30–3:00, <i>IMP 1</i>
February 5	Cookies, part 1, 8:30–3:00, <i>IMP 2</i>
February 5	Small World, part 1, 8:30–3:00, <i>IMP 3</i>
February 12	The Pit and the Pendulum, part 2, 8:30–3:00, <i>IMP 1</i>
February 12	Cookies, part 2, 8:30–3:00, <i>IMP 2</i>
February 12	Small World, part 2, 8:30–3:00, <i>IMP 3</i>
March 18	Shadows, part 1, 8:30–3:00, <i>IMP 1</i>
March 18	All About Alice, 8:30–3:00, <i>IMP 2</i>
March 18	Pennant Fever, part 1, 8:30–3:00, <i>IMP 3</i>
March 25	Shadows, part 2, 8:30–3:00, <i>IMP 1</i>
March 25	Pennant Fever, part 2, 8:30–3:00, <i>IMP 3</i>

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## ACTIVITY

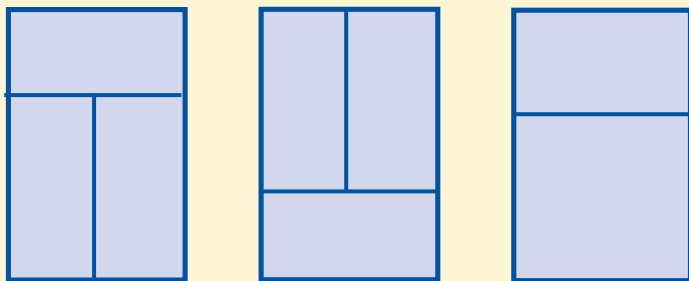
### Paving Patterns

“Patterns” is not just the name of the first *IMP* unit. It is also a theme that runs through many of *IMP*'s Problems of the Week (POWs). “Paving Patterns”, from the *Year 4* unit “High Dive” unit, requires students to gather data and find numerical patterns from a situation involving patterns of paving stones.

#### The Situation

Al and Betty are helping Al's family lay paving stones for a path along the side of their house. The path is to be exactly two feet wide. Each paving stone is rectangular, with dimensions one foot by two feet.

Al and Betty have realized that there are many ways to lay out the stones. For example, here are the arrangements they could use for a three-foot-long section of the path:



(Note: These three arrangements are all considered different, even though the first two are very similar.)

#### The POW

In the POW, students are asked to determine how many arrangements there are for a path that is 20 feet long (and two feet wide). They explore the problem by considering paths that are less than 20 feet long, finding the number of different arrangements for each shorter length. Then they look for a pattern in these numbers, and use the pattern to answer the question for a 20-foot long path.

#### The Challenge

Begin by finding the number of arrangements for paths of different lengths. Then:

- Find a pattern in the data that will allow you to calculate the number of arrangements for a path that is 20 feet long.
- Prove that your pattern is correct.

**Hint:** Look for a pattern that explains how to find the number of arrangements for a path of a given length if you already know the number of arrangements for certain shorter paths. But be sure to show that your pattern will always hold true.

# Regional IMPressions

## CALIFORNIA

*IMP*<sup>™</sup> teacher Moe Burkhart reminds us that showcasing students' work is perhaps the best testimonial to *IMP*'s effectiveness. Moe uses display cases located across from the main office at John Marshall High School in Los Angeles to regularly display her students' work. Faculty and departments can sign up to use one case for two or three weeks.

Once each semester, Moe displays *IMP* materials such as photos, student work, *IMP* manipulatives, texts, and other materials such as the "Colleges that accept *IMP*" list and important articles including "*IMP* Chosen as Exemplary Program."



*Moe Burkhart's students' work on display*

The displays are an easy way to give teachers, administrators, parents, and students a first-hand look at the many aspects of *IMP*. Students love seeing their pictures and work on display; they take great pride in their work. Teachers pop into *IMP* classrooms because they are curious after seeing the display.

Other possible display venues include your school's district office, local public library, local banks, and stores. It's critical that we continue to take the time to get out positive messages about *IMP* and the great work that our students do!

## HAWAII

Farrington High School's *IMP* classes were visited in April by ten educators from Liaoning Province in northeastern Mainland China (pop. 70 million; 336,700 teachers and administrators). China is just starting to experiment with moving away from teacher-centered instruction to student-centered classrooms. They were surprised that our teachers have their own rooms and can select their own curricula and materials. In China, students remain in the same room all day while teachers roam. Class size can be as large as 60.

Although China has a national curriculum with standardized textbooks, teachers are allowed latitude in how to teach the content and are provided ample time to collaborate. The Chinese visitors were intrigued with the idea of open-ended questions and the method of allowing students to work in groups to solve mathematical problems in *IMP* classes. They felt that what they observed in *IMP* classes at Farrington was the right way to go.

Moanalua High School piloted a "laptop" *IMP Year 2* class during the 1998-99 school year. Students had to provide their own laptop computers and learned to use Microsoft Office to write cover letters and end-of-unit reflection papers, critique POWs, do PowerPoint presentations of their POWs, and use Excel spreadsheets as a tool to organize their work and solve certain POWs.

This year the program will expand to three sections (two *Year 1* classes and one *Year 2* class). Teacher Mike Long initiated the project last year and teacher Lance Ogata will assist him this year.

NCTM's Western Regional meeting was held July 27-30 in Waikiki. Wendy Tokumine and Lynn Otaguro, *IMP* teachers at Farrington High School, provided an informational session on *IMP*. We welcome King Kekaulike High School on Maui to the *IMP* family. Every major island in the Hawaiian Islands now has at least one *IMP* school (one on Moloka'i, one on Kaua'i, one on Maui, five on Hawai'i, and seven on O'ahu).

Nawahiokalani'opu'u, a Hawaiian Immersion school located in Kea'au on the island of Hawaii, held its first graduation ceremony in June, with five students in the senior class. These students were taught three years of *IMP* in Hawaiian. It's interesting to note that *IMP* has helped to add new Hawaiian words to the language. There were a number of mathematics concepts for which there was no equivalent Hawaiian word. A Hawaiian word for the concept had to be created and submitted to the Lexicon Committee for approval. Upon approval, the new word was included in the Lexicon Dictionary of New Words which gets printed every couple of years.

## ILLINOIS

The Illinois Regional Center has had a very successful summer presenting workshops to teachers from 20 different Chicago schools as well as from a school in Cincinnati and one in Michigan.

Fifteen experienced *IMP* teacher-leaders worked to provide the staff development that began in February and lasted into August. Participant response was enthusiastic and resulted in new bonding among teachers from varied schools with a common interest in improving mathematics education. The groups from the *IMP Year 2* and *IMP Year 3* workshops went one evening on an outing to Navy Pier to celebrate a beautiful summer day in Chicago.

The Center has had a lot of new interest from Chicago schools. Four schools—Crane, Flower, Harper, and Manley—will be beginning partial or full implementation of *IMP* this fall. South Shore high school, which has had one enthusiastic teacher, Mark Jackson, using *IMP* for the last two years, now has all its teachers coming aboard after seeing the success Mark is having with his students.

There's been much interest—and requests for presentations—from Wisconsin school districts. Districts are apparently responding to the new state mathematics graduation exam and the need for new curriculum to prepare students for the content of this exam.

The Illinois co-directors and those from Minnesota have been asked to present the curriculum to committees of teachers. We've gone to Racine, Sheboygan, and Milwaukee. Most districts seem to be looking at two or more of the NSF-funded curricula. Wisconsin is in a good position to receive staff-development support, situated as it is between the Minnesota and Illinois Centers.

Milwaukee already has a strong *IMP* school, Grand Avenue, under the capable leadership of Mike Endress, known to many of you from the *IMP* teach listserve.

## MIDWEST

Jane Kostik, an *IMP*<sup>™</sup> teacher at Patrick Henry High School in Minneapolis, was honored recently with Minnesota's Presidential Award for Excellence in Teaching Secondary Mathematics. The award was presented June 7 at a ceremony in Washington, DC,



*Presidential Awardee Jane Kostik*

at the National Academy of Sciences. Her school will receive a \$7,500 grant from the National Science Foundation.

The 104 secondary mathematics and science awardees met in Washington for a four-day whirlwind of formal events. These included the awards ceremony and reception at the National Academy of Sciences, semiformal

dinner at the State Department, private reception at the Smithsonian Air and Space Museum, and breakfast on Capitol Hill with legislators.

Jane's "Best Lesson", on the statistics taught in "Is There Really a Difference?", was published in a booklet along with the lessons of the other award-winners. There was structured time to network and exchange "Best Lessons" with the other math teachers. The trip was a thrill of a lifetime, and an opportunity to meet and make new friends—particularly *IMP* teacher JoAnn Vana from Vermont. (See New England regional news, at right.)

## MIDDLE COLLEGE HIGH SCHOOL CONSORTIUM

The Middle College High School Consortium, a collection of alternative high schools on community college campuses across the country, is entering the third year of its grant to improve the quality of mathematics instruction in the Consortium. *IMP* has been a part of that improvement process.

There are now five Consortium schools implementing *IMP*: Middle College High School at Los Angeles Southwest College in California; Mott Middle College High School in Flint, Michigan; Lowell Middlesex Academy at Middlesex Community College in Lowell, Massachusetts; Benjamin Mays Academy at Kennedy-King College in Chicago; and Boyce Campus Middle College High School at Community College of Allegheny County in Monroeville, Pennsylvania. In July *IMP* teachers from these five schools completed five days of training in July in Glen Cove, New York.

There are several features about Middle College High Schools which make them unique. These schools are alternative high schools. They generally have a student population of kids who were not successful in the traditional high school setting for a variety of reasons. Students are drawn to the middle college high school because they have smaller class sizes and a great deal of contact

with and support from caring teachers. Many of these high schools offer special programs to facilitate a student's transition to college.

The schools in the Consortium implementing *IMP* also share a unique feature. They each have a college instructor who is teaming with a high school instructor in teaching *IMP*. As a result, the community college is learning more about reform mathematics and student-centered learning environments. The students will then have an easier time when they make the transition from their *IMP* mathematics classes to a more traditional mathematics class on the community college campus.

The unique features of the Middle College High Schools and their students present their own unique challenges. Networking, communication, and support is difficult when these schools are spread out across the country. The Consortium is now trying a new technique to bring Consortium teachers closer together. They are starting a new Consortium Web site.

*IMP* teachers can communicate with each other via the Web site, posing questions, sharing ideas, and exhibiting exemplary student work. More importantly, *IMP* students from the Consortium schools can have e-mail pen pals. They can work on Problems of the Week with students from another state and can share processes and strategies. They can also solve Problems of the Month in a competitive process. Feel free to visit our new site at [www.mcconsortium.org](http://www.mcconsortium.org).

## NEW ENGLAND

The New England regional center is pleased to announce receipt of awards by two wonderful teachers in our *IMP* family. Kudos and warm wishes to these two fabulous teachers!

Carla Oblas was selected in June for the Excellence in Teaching Award from Boston's Northeastern University—an extremely prestigious honor from such a huge university. Carla is the PI on the New England *IMP* grant, manages Balfour Academy, a school-year and summer academic program for inner city youth, and still has time to teach at the University. The particular class for which she was cited is called "Interactive Mathematics."

*IMP* teacher JoAnn Vana from North Country Union High School in Vermont has been selected to receive the state's Presidential Award for Excellence in Secondary Mathematics Teaching. She reports: "I used my experiences with the *IMP* program, complete with student work and pictures from my



*Northeastern University awardee Carla Oblas*

continued next page ►

# Regional IMPressions

*Year 1 and half of Year 2 curricula....”*

Our Regional Center had quite a busy summer. We led a series of four Year 1 workshops, including our first in Vermont and western Massachusetts, introducing almost 130 teachers to *IMP*<sup>™</sup>. In addition we held a total of five workshops in *Years 2-4*.

As our NSF grant comes to an end, we are directing more of our attention to leadership training. We held a well-attended leadership retreat for New England teachers in the spring. We are thankful to the Center for Enhancement of Science and Mathematics Education for funding our lead teachers to continue their training by co-leading many of our summer and follow-up workshops.

## NEW YORK

In June 1999, New York State introduced a new Regents exam for high school mathematics students. Over the next few years, this new Regents exam, known as the Form A exam, will gradually replace the old version. The Form A will eventually be a requirement for all New York state high school students to take and pass in order to graduate. In addition, a Form B exam will soon be introduced involving more advanced mathematics.

The implications of these new Regents Form A & B exams for nationally-validated curricula, such as *IMP*, are potentially enormous. For example, the Form A exam is made up of four parts. The first part includes fairly traditional multiple choice questions, but the next three parts are all *IMP*-like opened ended problems which are graded using rubrics.

Moreover, unlike the previous Regents exams in which students could avoid answering statistics and probability questions because they were given a choice of problems to answer, the new Regents exams require students to answer all types of mathematics problems and to justify their solutions.

New York City has more than 200 high schools and more than 300,000 students. For the past three years, the Philadelphia Regional *IMP* Center has been providing *IMP* training for over 100 New York City teachers from over 25 NYC high schools. More recently, Joseph Merlino and Ned Wolff—Philadelphia *IMP* co-directors, and currently Project Directors of the Greater Philadelphia Secondary Mathematics Project, an NSF Local Systemic Change project—have been asked to participate in and facilitate on-going discussions with New York City’s superintendents and central staff about rethinking mathematics instruction for high school students.

## NORTHWEST

*IMP*-NW just completed its sixth summer institute. This year’s institute was held at Pacific University in Forest Grove, Oregon. It was made possible by the fact that *IMP*-NW, in partnership with Pacific, received a one-year \$30,000 Eisenhower grant to help up to six Oregon schools offset the professional development costs associated with implementing *IMP*.

This year *IMP*-NW will be supporting schools located from

southern Oregon to Tacoma, Washington. These schools range from very small—with only one math teacher in the school district—to schools of up to 2,000 students; schools that offer *IMP* as their sole mathematics curriculum and schools that offer a dual program in mathematics; and schools that are offering *IMP Year 1* to 8th graders, as well as schools that are planning honors options for their *IMP* students.

## PENNSYLVANIA

With the support of our NSF Local Systemic Change grant, the Philadelphia regional *IMP* family continues to grow. We are focusing the majority of our efforts on schools committed to making whole-school change, wherein nearly every member of the mathematics department will participate in inservice programs and eventually teach the curriculum.

To help schools reach that level of commitment, we work with them in a systematic process for eight to twelve months to prepare them to adopt reform mathematics curricula such as *IMP*. The preparation for change includes starting with general awareness workshops, self-assessment, looking at student work, visiting other schools, and trying out the *Baker’s Choice IMP* replacement unit.

Our seven years of *IMP* experience have convinced us that the program has a dramatically higher probability of long-lasting success when an entire school—including teachers and administrators—are committed to change.

Another component that we have found to be necessary for long-term success is the collection and analysis of student achievement data. Towards this end, we’ve received \$75,000 from the National Science Foundation to design and implement a four-year longitudinal study analyzing the impact of *IMP* and block scheduling at Strath Haven High School, an all-*IMP* school in suburban Philadelphia. That study, to begin this fall, will be done in collaboration with researchers at the University of Maryland.

Our project now has a cadre of over forty mentors and inservice presenters. To assure continued high quality and adherence to the *IMP* philosophy, we have initiated a series of workshops for ten of our most experienced teacher-leaders. Modeled after national *IMP*’s TOPS program, these workshops give participants the opportunity to discuss presentation strategies, design inservice agendas, and develop effective ways to mentor other teachers.

## ROCKY MOUNTAIN

We have much to celebrate. With the completion of our Rendezvous the first week of August, teachers are gearing up for the beginning of the school year. Our summer institutes had more than a hundred participants, all of them looking forward to an exciting year of teaching *IMP*.

We are also celebrating that Dottie Kielian from Skyline High School in Longmont, Colorado, and a participant in our project for five years, has received the Presidential Award for Excellence in Secondary Mathematics Teaching. Finalists for this coming year’s Presidential Award include four-year *IMP* veteran Cathy Martin

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from South High School in the Denver Public Schools and Alan Tennison, a two-year *IMP*<sup>™</sup> teacher from Valley High School in the Albuquerque Public Schools.

All of us at *IMP*-RMR, in Colorado, and across the nation are also celebrating the reopening of Columbine High School. (Please see a special message from Columbine High's *IMP* teachers on Page 1.)

## NOVA SCOTIA

Nova Scotia French mathematics teachers had a very successful summer at the *IMP Year 4* training Institute. Dennis Cavaille, *IMP* teacher-leader from San Lorenzo Valley High School in Felton, California, was the instructor. Attendees included Christine Deveau of l'école secondaire de Clare; Kenneith Pothier and Thomas Boudreau of l'école Sainte-Anne-du-Ruisseau; Cyril Camus of l'école NDA; Michel Gagnon of l'école du Carrefour du Grand Havre; Elie Saab and Georges Saba of Sir John A. Macdonald High School; Maureen Finlynson of Halifax Regional school Board; and Alvin Gallant and Julie Gauthier from Prince Edward Island French Schools.

The agenda of our summer institute included the following topics: the *IMP*acts Mathématiques Year 4 and its correspondence, with the specific outcomes of the FEPA Mathematics Curriculum and the "High Dive," "As The Cube Turns," and the "The World of Functions" units.

"My students will bring to the calculus classroom a clear notion of functions and a conceptual understanding of rates of change and the derivative," Cyril Camus says. Julie Gauthier tells Dennis Cavaille and Antoine Jarjoura, the Regional Director of *IMP*, "Our students will arrive at universities believing that mathematics requires deep thinking. From their experiences, they will be confident in their own ability to think mathematically, and they will have excellent strategies to solve real-life problems and communicate results appropriately."

Workshops during the coming school year include fall and winter sessions on "Know How" and "Pollster's Dilemma" units and a second cycle of professional development for new *IMP* teachers.

In Nova Scotia's Fracophone and French Immersion schools, the interest in *IMP* is growing, and the Ministère de l'Éducation, Direction des Services Acadiens et de Langue Française, continues to conduct productive professional development sessions, providing an opportunity for all French mathematics teachers to become familiar with the *IMP* units and associated technology.



INTERACTIVE MATHEMATICS PROGRAM

## Professional development . . .

*continued from page 3*

### Minnesota provides continued training in *IMP 1, 2, 3, and 4* according to the following dates:

<i>IMP Year 1</i>	September 28, November 22, January 20, March 16
<i>IMP Year 2</i>	October 5–6 and February 14–15
<i>IMP Year 3</i>	October 14–15 and January 14
<i>IMP Year 4</i>	October 21 and November 9

Minnesota *IMP* also provides *IMP 1* training in Wisconsin. Those dates are October 6, February 1–2, and March 30.

The **New England Regional *IMP* Center** offers *IMP 1* training in Boston, MA, Newport, VT, and Northampton, MA all on the same dates: September 24, October 29, December 10, February 1, and March 3. *IMP 2* training will be in Boston on October 1, November 2, January 2, and April 2. *IMP 3* training will also be in Boston on October 15, November 19, February 11, and March 10. *IMP 4* training will likewise be in Boston on October 22, December 3, March 31, and April 28.

The **Northwest Regional *IMP* Center** in Oregon will be hosting their winter retreat on February 3–5. They will also have focus sessions throughout the year on October 2, October 16, December 4, January, and April.

### The Pennsylvania Regional *IMP* Center has tentatively set their dates as follows:

<i>IMP Year 1</i>	September 25, October 23, December 4, February 5, and March 4.
<i>IMP Year 2</i>	October 16, November 20, December 11, February 26, and April 8.
<i>IMP Year 3</i>	October 2, November 6, December 4, February 5, and March 4.
<i>IMP Year 4</i>	October 2, November 6, and others TBA

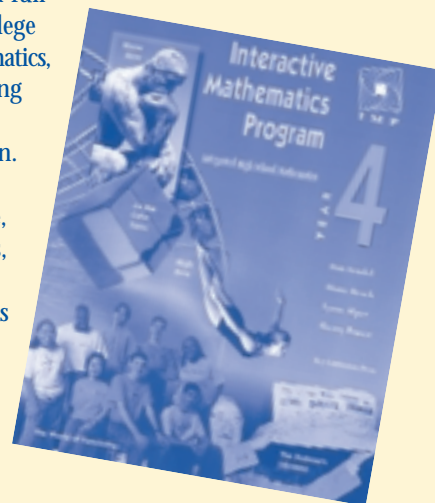
Anyone seeking the exact dates and/or content of the inservices should call (215)951-1987. There will be additional *IMP Year 1* sessions scheduled in surrounding suburbs. Call the aforementioned number for details.


For additional information about any of the professional development opportunities listed, or for information from one of the regional *IMP* centers not mentioned, please contact the regional *IMP* center directly.

## Key Comments

The long-awaited *Interactive Mathematics Program® Year 4* is finally here! *IMP 4*, the fourth in a series of four, completes the set. Shaped by ten years of field testing, *IMP 4* completes a full curriculum for college preparatory mathematics, created with backing from the National Science Foundation.

*IMP 4*'s units include High Dive, As the Cube Turns, Know How, The World of Functions and The Pollster's Dilemma. Your students will continue to think creatively and critically through problem-centered approaches that allow them to draw from many areas of mathematics and to solve real-life problems.



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Innovators in Mathematics Education  
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**IMP**

*IMPressions* is published by Key Curriculum Press each fall and spring. We invite readers to send *IMP*-related ideas and comments to us at: *IMPressions*, 1150 65th Street, Emeryville, CA 94608.

Publisher: Steve Rasmussen  
Editors: Lynne Alper, Mona Helen Preuss  
Production and Layout: Peter Sy Chua