



Director: Richard Waring
Mathematics Coordinator: Richard Delaware

August 1, 1994

Vol. 9, No. 1

YEAR 11:
THE SECOND DECADE BEGINS

As we begin our second MPI decade, the largest starting group we have ever had, 88 students, will appear on Sept. 7, including students not only from our usual 6 high schools, but also 7 from St. Mary's, and 1 from Paseo High School! This group is so large that we have had to open a new section E, and reserve a new room, to preserve our small class sizes. In addition, we have had to ask Al Morse (recently retired from Wm. Chrisman High School, but thankfully not from the MPI) to teach two sections of Calculus, and have called back from retirement Calvin Nelson (formerly of Northeast High School) to help with Physics problem solving and labs. Finally this year, we are buying 2 more PCs for our PC lab, to handle the crowd.

Yet this large number of new MPI students is not the only novelty for Year 11: We are also adopting a new Calculus text, Calculus: Graphical, Numerical, Algebraic, by Finney, Thomas, Demana, & Waits, and are welcoming a new Calculus teacher, Tina Knutson from East High School, replacing Joe Kaifes of Van Horn High School who retired last year. [We made certain to see him off well, with a party on May 14 at the Director's house.] Of course, we will continue to require graphics calculators of all our students as we did for the first time last year. [See the graphics calculator article below.]

Among some bits of miscellaneous news: On May 12 all our rooms received new, white miniblinds on doors and windows; we are adopting (finally!) a software package for grading and attendance, Record Breaker!; and, the summer 1994 issue of Perspectives, the Newsmagazine of UMKC, featured the

MPI in a large, very nice, two page article.

So we welcome our 11th class, but with all the changes are taking a collective deep breath.

MPI STUDENT ORIENTATION
SEPT. 7 - 9, 1994

Each year the first three days at the MPI are spent in giving our students an overview of how we operate, a discussion of our policies on attendance, grading, etc., and two diagnostic tests. Time is then set aside for the instructors to informally 'get to know' their classes before we all become preoccupied with class work.

In particular, on the first day, Sept. 7, 1994, we'll provide each student with a packet of information and have each of them fill out a personal data form.

PLEASE BRING, ON SEPT. 7,
7 am, TO ROOM 207

- Your Social Security Number.
Your daily schedule of high school classes.
Your schedule of extra-curricular activities.
Your counselor's name.
Car license number, make and model, for those ever planning to drive to the MPI.
Ideas for Enrichment Speaker topics.

We look forward to seeing our 11th class on Wed. Sept. 7!

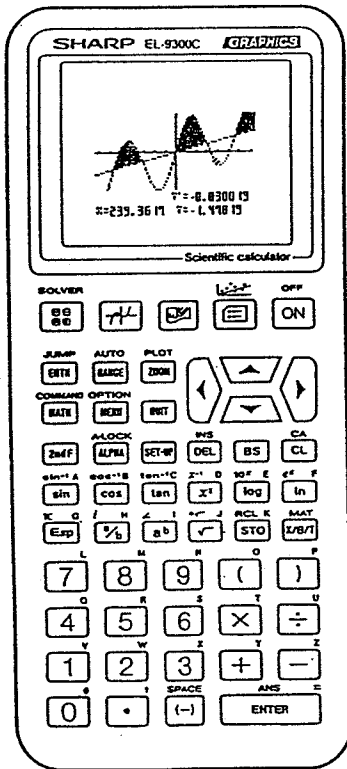
MPI E-MAIL ADDRESS:

rdelaware@vax1.umkc.edu

A list of known MPI Alumni e-mail addresses is available on request.

**SHARP EL-9300C
GRAPHICS CALCULATORS**

The MPI requires ALL students to have and use a graphics calculator in both physics and calculus, and for our purposes we have selected the SHARP EL-9300C. Although it is not the most powerful such graphics calculator on the market, it is ideally suited to the MPI, and its selection of students.



All MPI students are required, within the first few weeks, either to rent a SHARP from us, paying a \$10.00 one-time, non-refundable fee for the entire academic year, with an option to buy the calculator outright at any time [the full price, after the rental fee is deducted, is \$55.00], or to provide themselves with a better graphics calculator, specifically either a TI-85 or an HP 48G. [Information, including cost,

on all these graphics calculators can be gotten from the MPI Mathematics Coordinator by calling 235-1290.] These rented calculators will initially be loaded with a set of 4 AAA batteries, but as these fail over the course of the year, student-renters are entirely responsible for buying and replacing them. (Our experience has been that at most one or two replacements are needed over the year.)

At the beginning of Year 10 (1993-94), 49 MPI students rented our SHARP EL-9300Cs, and at year's end, 24 bought them. 3 MPI students used their own TI-85 all year.

TO ALL MPI ALUMNI:

HAVE YOU GRADUATED FROM COLLEGE?

IF SO:
PLEASE CONSIDER BEING AN MPI ENRICHMENT SPEAKER!

CALL (816) 235-1272

**1994 MPI AWARDS PRESENTATION
AND
TOP 10 MPI STUDENTS OF 1993-94**

Our final awards presentation was held on May 19, 1994, during which we were pleased to present many of our 1993-94 students with the following variety of awards:

Certificates for Outstanding Achievement (college grade of A or B):

CALCULUS I

(Name)	(School)
Matt Barrows	Truman
Matt Cianciolo	Truman
Mark Cleveland	Ft. Osage
Charity Coney	Truman
Jeff Flowers	Wm. Chrisman
Chris Goldsmith	Truman
Mark Hamblin	Truman
Aubrey Hanks	Ft. Osage
Rachel Hayes	Ft. Osage
Bobbi Jo Hopkins	Wm. Chrisman
Amy Hurd	Truman
Dung La	Northeast

Jenna Medina	Wm. Chrisman
Brad Owings	Ft. Osage
Joshua Small	Wm. Chrisman
Joanna Tucker	Wm. Chrisman
Jason Walker	Wm. Chrisman
Mike White, Jr.	Ft. Osage

CALCULUS I and II

Jill Dawson	Truman
Sam Dorton	Wm. Chrisman
Jennifer Yutzzy	Wm. Chrisman

PHYSICS

Chris Allen	Ft. Osage
Matt Barrows	Truman
Matt Cianciolo	Truman
Mark Cleveland	Ft. Osage
Jill Dawson	Truman
Sam Dorton	Wm. Chrisman
Mark Hamblin	Truman
Aubrey Hanks	Ft. Osage
Rachel Hayes	Ft. Osage
Bobbi Jo Hopkins	Wm. Chrisman
Amy Hurd	Truman
Dung La	Northeast
Jenna Medina	Wm. Chrisman
Hanh Phan	Northeast
Joshua Small	Wm. Chrisman
Trang Tran	Northeast
Joanna Tucker	Wm. Chrisman
Mike White, Jr.	Ft. Osage
Jennifer Yutzzy	Wm. Chrisman

students to whom the MPI awarded Chancellor's Scholarships:

UMKC Chancellors Award Winners:

Dung La	Northeast
Hanh Phan	Northeast
Jesse Skinner	Wm. Chrisman
Mike White, Jr.	Ft. Osage

UM Curators Award Winners:

Chris Allen	Ft. Osage
Jill Dawson	Truman
Mark Hamblin	Truman
Aubrey Hanks	Ft. Osage

**ADVICE TO STUDENTS OF YEAR 11
FROM THE STUDENTS OF YEAR 10**

At the end of this last year, in May, we decided once again to have our students write however much they wanted in answer to the question:

"What ADVICE would you give to incoming students about study, attitude, or any other aspect of surviving the MPI in 1994-95?"

We were pleased at how seriously and with what maturity they wrote, and so each incoming student, after a few weeks of class, will receive a complete set of these words of advice from 42 students of Year 10. Here are some excerpts from that document:

We also honored the TOP TEN students (ranked according to the mean of their full-year college calculus and physics grades) by giving them a one year subscription to Scientific American magazine, a copy of the May issue of Scientific American, and a copy of "What's Happening in the Mathematical Sciences":

TOP 10 MPI STUDENTS 1993-94

- | | |
|--------------------|--------------|
| 1) Aubrey Hanks | Ft. Osage |
| 2) Jenna Medina | Wm. Chrisman |
| 3) Joshua Small | Wm. Chrisman |
| 4) Mark Cleveland | Ft. Osage |
| 5) Rachel Hayes | Ft. Osage |
| 6) Sam Dorton | Wm. Chrisman |
| 7) Mike White, Jr. | Ft. Osage |
| 8) Jill Dawson | Truman |
| 9) Bobbi Hopkins | Wm. Chrisman |
| 10) Joanna Tucker | Wm. Chrisman |

"If you're someone who's never had to study to make A's in high school, you need to develop some new study habits. MPI is not like high school. You have to have the time and the energy to learn outside of the classroom. If you're coming in with the attitude that these are just two more classes, think again. To be a success you have to put forth an extra effort and work hard. You either have to make the time, or get used to not coming out on top."

Kelly Beale
Wm. Chrisman High School

Finally, we list those MPI students planning to attend UMKC who received various scholarships from UMKC; included here are those

"If you haven't had trig. don't panic. It's not impossible to do well if you haven't had it. Use the problem solving days wisely. After you've had a lecture, work on problems for about an hour. Then

when you come to a problem solving day you have questions, and get them answered so the questions don't pop up the night before the test when you're cramming."

Mark Cleveland
Ft. Osage High School

"If you plan on making the grade at MPI, plan on spending a lot of late nights doing labs, problems, or studying for a test. It helps a lot to do all of the problems early so you can ask questions during problem solving before the tests. I suggest on using all resources available to you; Derive, your calculator, your partner's work (Ha Ha!). Always try to keep up with the studies and remember, this is your first glimpse of college class. Plus it is college credit for free, so take advantage of it. And remember -
- DON'T SLEEP IN CLASS! Good luck!"

Matt Cianciolo
Truman High School

"DON'T EVER slack off. You can't afford to or you will get behind very quickly. I found out the hard way. If you ever have a question about something you don't understand, ask your teacher. They will try to help answer your questions. When tutoring is offered, I would recommend going. Overall MPI has been very rewarding to me. It has taught me that things in life need to have hard work put into them, or nothing will ever be given back."

Derek Fisher
Truman High School

"My first piece of advice for MPI students in 1994-95 is to take both physics and calculus. If you take both, then you'll get to know your classmates better and be able to take full advantage of the varieties of learning at MPI.

Once you get to MPI, be prepared to work. Success won't come unless there is time spent studying. I know that with all the other high school activities and your upcoming graduations that it is hard to find free time, but you have to try and schedule in the time. Also, I recommend not putting things off until the last minute. If you're trying to cram for a test and run

into a topic you don't understand there won't be teachers around to ask. Take advantage of the limited problem solving sessions. They are invaluable.

Finally, don't get frustrated, but definitely don't give up! Sometimes assignments will seem impossible, but don't forget there is always partial credit!"

Aubrey Hanks
Ft. Osage High School

"MPI will be the most intense learning you've ever had. You're in for early mornings and late nights, especially if you have a job. Your social life will diminish to nothing. Your spare time will be spent studying.

However, I strongly urge you to stick with the program no matter how frustrated you get. Your instructors are always available for tutoring and extra help—all you have to do is ask. And if you hit a brick wall while studying, don't keep working because you'll only get more frustrated and confused. Just put it away and forget about it for awhile. You'll be surprised at how much easier it is with a clear head."

Michelle Peterson
Wm. Chrisman High School

"When the teacher lectures, take a few minutes to review those notes that day. Don't wait until next week because by then you will have forgotten how to solve those problems. At the beginning of each chapter, you will have a sheet listing the suggested problems. Even though the teachers rarely collect them, you'll be a lot better off with them done. As the year progresses, many of you will see that MPI is nothing like high school. But don't worry—if you did your homework and reviewed your notes—you'll be alright."

Hanh Phan
Northeast High School

"It was a total shock to me. I'd never really had to study before. I had to make a lot of decisions and sacrifices and I had to basically give up my social life. Usually weekends were a time to catch up on work and study for tests. I tried to

stay in sports but it got so difficult being involved in so many activities that I eventually had to quit sports altogether. Be prepared to make a lot of personal sacrifices and study—I didn't do it as much as I should have and now I regret it!"

Jessica Schmitt
St. Mary's High School

"Never keep to yourself, make friends with everybody. STUDY, yes that is one major priority in MPI! If you don't understand always put your hand up and ask questions, never think you will get it later because you won't! Never let a problem bring you down, just keep working at it!"

Janice Wallace
Van Horn High School

THE 1994-95 CLASS (TO DATE)

Section A

Jennifer Brown	Wm. Chrisman
Jeremy Corcoran	Ft. Osage
Phuoc Dang	Northeast
Kathy Hall	Wm. Chrisman
Nathan Haynes	East
Jennifer Keeling	Truman
Pamela Moseley	Wm. Chrisman
Daniel Navarro	Northeast
Long Nguyen	Northeast
Suong Nguyen	Northeast
Derek Olson	Ft. Osage
Lochna Patel	Truman
Phillip Prince	Wm. Chrisman
Nicole Puhr	St. Mary's
Christi Redman	St. Mary's
Phillip Tivis	Wm. Chrisman
Hattie Williams	Van Horn
Sheeneka Wright	Northeast

Section B

Bethany Dade	Wm. Chrisman
Heather Daniel	Wm. Chrisman
Tim Davis	Ft. Osage
Chris Fugate	St. Mary's
Rachael Gard	Truman
Matt Heide	Wm. Chrisman
Robin Karn	Northeast
Antonio King	Van Horn
Nicole LanFranca	Truman
Jamila Mathis	Van Horn
Ben Moore	Wm. Chrisman
Lam Phan	Northeast
Linh Phan	Northeast
Peniata Tali	Northeast
Marlene Toole	Ft. Osage
Sandra Werner	St. Mary's
Jennifer Woolsey	Northeast

Section C

Devin Allen	Truman
Peter Anderson	Wm. Chrisman
Amy Bentz	Truman
Anne Croston	Ft. Osage
Josiah Freeman	Truman
Joseph Haney	Wm. Chrisman
Eric Huss	Truman
Randon Kent	Wm. Chrisman
Dana Kliethermes	Truman
Lisa Martin	Truman
James McIntosh	Truman
Mark Molder	Wm. Chrisman
Aimee Newell	Wm. Chrisman
Hung Nguyen	Northeast
Vu Nguyen	Wm. Chrisman
Rachel Roberts	Truman
Rebecca Schwietz	Ft. Osage
Jennifer Stafford	Truman
Ted Verren	Ft. Osage

Section D

Amy Coop	Wm. Chrisman
Angelynn Eickhoff	Truman
J.J. Fields	Paseo
Jamie Green	Ft. Osage
Douglas Hallmon III	Northeast
Brian Hampton	Wm. Chrisman
Charles Langley	Northeast
Thinh Le	Northeast
Greg Long	Van Horn
Rachel Lykens	Wm. Chrisman
Shalyn Martin	Northeast
Carrie Morey	St. Mary's
Rosa Nunez	Northeast
Daniel Skelton	Wm. Chrisman
David Stephenson	Truman
Tafe Tonga	Truman
David Visnich	Ft. Osage

Section E

Nicole Baltrusaitis	St. Mary's
Patrick Brown	Ft. Osage
Michael Dang	Northeast
Chuck Dilley	Wm. Chrisman
Tim Gamboa	Wm. Chrisman
Leslie Gross	Ft. Osage
Ahmad Latifzai	Van Horn
Frank Macke	St. Mary's
Crystal McNeil	Northeast
Jennifer Musil	Truman
Hang Nguyen	Northeast
Linh Nguyen	Northeast
Dawn Oliver	Van Horn
Kathy Owen	Truman
Brian Stuck	Wm. Chrisman
Hien Tran	Northeast
Roger Webb	Wm. Chrisman

These are the total of 88 students (as of this newsletter) who will be enrolled. As usual there

will be additions and deletions through September.

THE 1994-95 STAFF

In PHYSICS:

Larry Harding from Fort Osage, Jim Graczyk from Van Horn, and Calvin Nelson (back from retirement!)

and, in CALCULUS:

Sheri Adams from Truman, Tina Knutson from East, and Al Morse (retired) from Wm. Chrisman.

Our University staff is listed in the heading of this newsletter, and our half-time secretary and assistant is Doris Kirst.

MPI T-SHIRTS!

Beginning in about October, we will once again be selling bright blue MPI T-shirts and sweatshirts to our students. These shirts have a classy 3D graph ($z = \cos x \cdot \sin y$) on the back and our student-designed MPI logo on the left front.

ENRICHMENTS

FOLLOW UP

On March 25 Tony Hancock, a British chemist and science administrator at Marion, Merrell, Dow, Inc., spoke on MOLECULAR ARCHITECTURE.

Student comments follow:

--He spoke of the behavior of two molecules, the oldest pub in England, fat, and ear wax. As dull as this may seem, it is the basis for his topic, glycerol. Freeze glycerol to examine how it reacts. He spoke clearly with an understanding of what our minds could absorb. Great accent! He was extremely friendly and personable. Bring him back.

--The speaker was very enjoyable. He was in touch with our audience and smoothly put intricate details onto our level of understanding. He was also interesting and kept my full attention, even though I was a bit boggled by what he was saying.

--He stressed that the reactions between molecules are really what makes things happen. The structure (shape) changes when molecules melt. He proved through explanation of his experiments that the structure of molecules makes a difference. He kept it simple enough to understand but not below what we are able to comprehend. He talked to us, not at us. It wasn't just a lecture and it was very enjoyable.

--He talked about how the field of science has changed over the past 20 years and did a lot of comparisons. He also told us about his field and everything he is involved with. I like how he stressed understanding the ideas rather than everything on the charts.

--Mr. Hancock outlined for us the research program he worked on for many years until his laboratory burnt, and he lost his materials. His basic experiment was to determine if the rotating bonds between the carbon compounds on a lipid affected the molecule in any way. To test this he created many ring bounded isomers of the lipid in question-glycerol. He explained to us how complicated the field of science is, and how a scientist must find his own funding for research. Mr. Hancock actually tried to speak on our level and didn't bore us with details that mean nothing to us.

On April 15 Brent Harding (MPI 84-85), now an aerospace engineer at McDonnell-Douglas, spoke on HUBBLE REPAIR, ASTEROID MISSIONS, AND A COMET STRIKE ON JUPITER:

--He used the computer to show pictures taken in space. Neat. There is going to be trouble when bits of a meteor hit the face of Jupiter this summer. Some satellites will be able to record it. Possibly dinosaur extinction answers. Very good presentation.

--He helped work on repairing the Hubble telescope. Even when Hubble was "blind", it could see better than any telescope on Earth. People were afraid of breaking it during repairs on the mirror. Fortunately, the repairs were a big success and we got to see some really cool pictures from outer space. We now have proof that a moon orbits around an asteroid. We have been trying to learn more about

Jupiter, and have launched "Galileo" to send a probe and collect information.

--The subject Brent spoke about was really interesting. He is fulfilling a dream I've had by working with McDonnell Douglas, and working with NASA on all these satellites. Brent had excellent pictures to show us of planets and asteroids. He spoke of the Hubble satellite as well as comets and planets. I found the info given concerning the comet pieces crashing into Jupiter to be most exciting. EXCELLENT ENRICHMENT.

--Mr. Harding's lecture was one of the best and most informative ever. The computer generated graphics were spectacular. He brought photos taken by the Hubble telescope both before and after it was fixed, and he explained how they fixed it. He also showed us a broken comet that will collapse into the surface of Jupiter in summer months. His lecture wasn't too difficult to understand plus he was a good speaker making for a very enjoyable experience.

--Harding had a very enthusiastic speech, which I think everyone liked. He explained about the Space Shuttle, stars, planets, and the equipment used to observe them. We learned that this summer a comet that is traveling in a string (each particle the size of a mountain) will be impacting on Jupiter. The occurrence is being observed so closely because the sun has a comet orbiting it on the same path as Earth. Sometime in about 150 years this comet will come very close to Earth and the Department of Defense wants to observe the effects of Jupiter's comet so that they can take precautions about ours. This has been the most interesting by far of all the enrichments.

--I was very impressed with Mr. Harding's enrichment. The photos were great and really kept my attention focused on what he was saying. I found it interesting that asteroids have moons. Also, I was amazed at our ability to take photographs of something in space (that is only a few miles wide) from 3 thousand miles away! That is almost like viewing something in California from South Carolina! He was very friendly and kept the subject matter at our interest level--one of the best!

--Brent showed us some really beautiful pictures of outer space. Different stars, galaxies, and planets were included. A comet is supposed to hit Jupiter in 1994 and 3 different satellites should be able to get pictures. The Hubble telescope, even though it didn't work properly, still brought in space pictures that were better than pictures taken on Earth. Now that Hubble is fixed, the pictures it takes of other galaxies and stars are amazingly clear.

On April 29th Shelley Wolff, a civil engineer, discussed **HIGHWAY SLOPE DESIGN**. The students responded:

--She showed us slides of roads and bridges and explained how they are designed. She told us about some of the problems related to highway slope design, and the good things about it. She explained how they use the computers to help with their work and let us "drive" on a road that isn't even built yet.

--We talked about the new designs systems civil engineers are using, and some of the new beliefs. Anymore they try to make the roads environmentally safe, and landscaped. The most interesting aspect of a civil engineer's job is that they don't use calculus at all, which really surprised me. The help of lots of pictures and diagrams made the lecture pretty interesting.

--They now have computers that simulate a highway so that you can see it as you would if actually driving on it. Ramps must be sloped so that rainwater runs off them, hills must be flattened so that a driver may see over them, and overall an even roadway so that the driver doesn't go on a roller-coaster ride. My favorite part was the simulated highway on the computer. The bridges were interesting also.

--I was very surprised to learn that new highway projects must be done in metric measurement--one never thinks of such expenses as changing road signs to "kilometers" instead of "miles". In fact, she brought up several ideas that were new to me and will make me think a bit more as I drive.

--There are many types of engineers--the speaker was a civil engineer. I've always thought of this field as rather dull, but she changed my mind. Building bridges, highways, and airport runways are quite interesting.

--Civil engineering is more than just building bridges. It also involves water treatment making sure water stays clean. Civil engineering also includes airport design, designing airports for safety. Mass transit is another to create better ways of transit, and highway design, building highways to create safety for people on the highway with all the cars.

--She gave us a basic description of her job, road and bridge design, she explained what techniques they used, showed us slides, computer drafting, and even a computer animated film. She was an excellent speaker with a well prepared easily understood presentation.

UPCOMING

One of the special features of the MPI is its biweekly enrichment series, in which on alternate Fridays either professionals in the sciences, engineering, mathematics, etc., speak to our MPI students, or, we have a field trip to such places as the nuclear research reactor in Columbia, various science exhibits, or Worlds of Fun for some 'hands on' physics.

The October 1 newsletter will report on those speakers scheduled for October and beyond. But as part of our first three days of orientation, Debra Gaggens of UMKC, will speak on **Friday, Sept. 9** about college admissions in general, and the importance of thinking about applications **EARLY**. (This is not intended to be a recruitment for UMKC, but a general discussion to help sensitize our students to the importance for colleges of deadlines.)

During the first two weeks of classes at the MPI we will also spend one day discussing three topics which we have come to believe are vital study and college survival skills that are too often not directly addressed. Specifically, these are: **TEST-TAKING, READING A TEXTBOOK,** and lastly, and perhaps most importantly, **TIME MANAGEMENT**. These sessions will

be jointly presented by Augusta Nichols from UMKC's Academic Support Services, and the MPI Mathematics Coordinator on **Friday, Sept. 16**.

On **Sept. 30**, Mitch Dobson (MPI 89-90), currently the resident Prosthetist/Orthotist at Certified Orthotics and Prosthetics Associates in Lenexa, KS, will speak on **PRINCIPLES AND ADVANCEMENTS IN PROSTHETIC TECHNOLOGY**.

**TO THE PARENTS OF THE 1994-95
CLASS AT THE MPI**

[Modified from the August 1, 1987 newsletter.]

This newsletter is written for YOUR information, and there will be one sent to you every two months during this year while your son or daughter is at the MPI.

We firmly believe that without your support and concern at home students cannot succeed in such a rigorous program as the MPI. Our classes are NOT high schools classes, and require both study skills and a commitment that students still in high school, however talented, have not experienced before. In both of these areas YOU as parents can be of enormous help.

One of the first facts we have learned to face in the last ten years is that many bright students never learn to study efficiently; they have often gotten along very well with a 'wait and cram' attitude, giving textbooks only an occasional cursory look in time for testing, and relying on their innate ability to absorb information and skills in the classroom. However, in coming to the MPI these same students always find themselves at first, and suddenly, falling behind.

In general, in college classes **MORE MATERIAL** is covered, and **MORE SKILL** with concepts is required, i.e., **THINKING** is expected regularly. This comes as a shock to many talented students. One of the MPI's goals is to expose students to this shock, and help them overcome it by learning effective study skills in actual practice. But YOU as parents can help this transition enormously, by suggesting that your children actually spend the minimum of one

Mathematics and Physics Institute

CALENDAR 1994 - 1995

MPI Begins	September 7, 1994
Mid-1st Quarter Progress Reports Sent	October 7, 1994
1st Quarter Grade Reports Sent	October 28, 1994
MPI OPEN HOUSE for Parents/Teachers/etc.	Sunday, November 6, 1994
Thanksgiving Holiday	November 24-25, 1994
Mid-2nd Quarter Progress Reports Sent	December 16, 1994
Christmas Holiday	December 21, 1994 - January 2, 1995
MPI Classes Resume	January 3, 1995
College Credit WD Deadline (Math C Only)	January 13, 1995
Martin Luther King Holiday	January 16, 1995
Final Exam - Calculus I - (Math C Only)	January 17, 1995
Deadline for Transfer from Math C to Math A, B, D	January 18, 1995
2nd Quarter/1st Semester Grade Reports Sent	January 18, 1995
Mid-3rd Quarter Progress Reports Sent	February 17, 1995
Presidents' Day Holiday	February 20, 1995
3rd Quarter Grade Reports Sent	March 24, 1995
MPI Spring Break	March 27-31, 1995
MPI Classes Resume	April 3, 1995
Mid-4th Quarter Progress Reports Sent	April 21, 1995
Final Exams - Calculus I (A, B, D) and Calculus II (Math C Only)	May 15, 1995
Final Exam - Physics (A, B, C, D)	May 16, 1995
MPI Picnic Breakfast (McCoy Park)	May 17, 1995
MPI Awards Presentation/Last Day of Classes	May 18, 1995
4th Quarter/2nd Semester Grade Reports Sent	May 19, 1995

hour per subject, per night of study that we here at the MPI urge. They must come to realize that longer study times reflect the new rigor of the COURSES, not their lack of talent. This is a point of view that many students find hard to accept at first. Your encouragement can help them over this hump. Encourage them to seek the help of all the teachers involved in the program, and to put aside the false idea that only remedial students need to TALK about mathematics and physics. The fact is that true understanding comes only from learning to discuss and explain a subject, and this is ESPECIALLY SO in physics and mathematics.

Finally, we urge you to call us if you ever have a question, and we hope that you will find time to visit the MPI during our annual **OPEN HOUSE** on Sunday afternoon, **November 6, 1994**. (More about this in the October newsletter.)

WE HEAR FROM PAST STUDENTS

JEFF THATE (89-90)
(Mechanical Engineering Major)

"The teaching is excellent at MPI. The degree of personalized attention you receive, such as during problem solving sessions on the blackboards, is rarely given in college classrooms and really helps you understand how to work the problems better and faster.

Recently in one of my classes on linkage dynamics we've been using the calculus principles that are taught in Calc I. We've been taking a lot of derivatives that require the use of the chain rule. Every time I take a derivative I can hear Mr. Kaifes reminding me to use the chain rule—and now I guess I'll never forget."

MATT ROBERDS (90-91)
(Computer Science Major)

"The MPI courses were a bit better than the math (calc 2.3) and physics (1 & 2) classes I took at UMR. This was due I think to the smaller class sizes and greater involvement of the instructors at the MPI.

I had to re-take Physics 1 because the MPI physics is "not

calculus based". I thought this was BS because the "calculus based" physics at UMR always seemed to have the calculus part 'tacked on' as an afterthought (i.e., in the last 5 minutes of the lecture on position, velocity, and acceleration, the Prof. might show how those were derivatives of one another.)

In the 'use of computers' field, such as Derive, and the graphing calculators, I would suggest, if you all can get access to VAX1 accounts @ UMKC, to perhaps get some for the students and let them use them at a basic level (mail, logging in/out). You could use some of the math software on VAX, and also give students computer experience—many classes at UMKC are on class e-mail lists whereby homework, reminders, class changes etc. are sent out. This would get students familiar with using a college mainframe—this is almost becoming as useful as a telephone at many schools."

NATE MOORE (87-88)
(BS Electrical Engineering,
MBA Business Administration)

"Feel free to distribute my internet address to all other MPI alums out there in cyberspace. (Nate_Moore@notes.pw.com) I'd also like the "list of known MPI alums with e-mail addresses".

FYI, at present, I am working for Price Waterhouse, the accounting and consulting giant as a high-tech business consultant. Advise them on lots of EE/business cross-issues and the like."

EUGENE BAE (86-87)
(BS Electrical Engineering,
MA Technology and Policy)

[An excerpt of these comments was included in the Summer 1994 issue of PERSPECTIVES, the Newsmagazine of the University of Missouri-Kansas City.]

"With the head start MPI provided me, I was able to take advanced engineering courses earlier in my college career, and that allowed greater flexibility in shaping my degree program. When I chose electrical engineering as my major, I had enough exposure to make

an informed decision. Also, I was able to utilize the added flexibility in my curriculum to pursue outside interests, one of them being politics.

I have since completed my masters degree in Technology and Policy from MIT, and I am a part of the Clinton Administration team as a program manager in the Defense Department with responsibilities in Environmental Technology. Without question, the MPI experience played a significant role in helping me get to where I am today.

The opportunity to interact with students from other area schools is one of the greatest assets of the program. Not only did I develop team-building and group problem solving skills, but I also developed a number of close friendships that I still maintain.

Looking back, many students chose not to participate in the program because the classes were held at the UMKC Truman Campus, a non-trivial commute for high school students at 7:00 in the morning. However, I believe the same issue served a benefit in promoting greater academic independence and responsibility. As a high school student, I didn't have to attend MPI; I could have chosen to take the easier path and taken other course offerings. Inasmuch as I had the choice of which classes to take, the practice of choosing the most challenging courses was a great service to me. Rather than simply "getting by," I was able to fully utilize my college experience and get the best possible education for my money."

A SOLUTION TO MATHEMATICS CHALLENGE #33

Recall the problem statement:

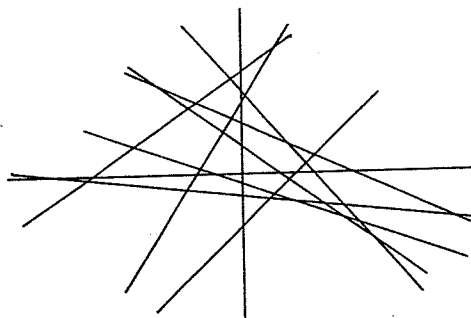
A city has 10 bus routes. Is it possible to arrange the routes and the bus stops so that if only ONE route is closed, it is still possible to get from any one stop to any other (possibly changing busses along the way), but if any TWO routes are closed, then there are at least 2

stops for which it is impossible to get from one to the other?

[From: Challenging Mathematical Problems with Elementary Solutions, Vol.II, by Yaglom & Yaglom.]

SOLUTION:

The answer is YES, there is such an arrangement of bus routes. As one example, suppose you have 10 lines in the plane, no two of which are parallel, and no three of which intersect in the same point. The lines represent bus routes and the points of intersection are the bus stops.



Clearly we can get from any one bus stop (intersection point) to any other. In fact, we can do this without changing buses, if the bus stops lie on one line; if not, it's still possible, by changing buses at most once.

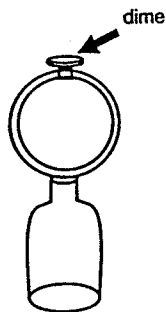
Now, if we discard one line, it's still possible to get from any one bus stop to any other, changing buses at most once. However, if we discard TWO lines, then one bus stop (the point of intersection of the two lines) will have NO bus routes passing through it, and so it will be impossible to get from this bus stop to any other.

A SOLUTION TO PHYSICS CHALLENGE #24

Recall the problem statement:

Balance a wooden embroidery hoop on the top of an empty bottle whose opening is larger than a dime. Place the dime on the hoop as shown.

PHYSICS CHALLENGE #25

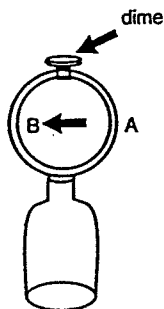


How can you knock the hoop away with your finger so that the dime falls into the bottle?

[From: The Physics Teacher, Feb. '94]

SOLUTION:

See the picture below:



If you strike the hoop at point A, then it buckles into a vertical oval that sends the dime flying across the room before the hoop falls away. However, if you strike the hoop as shown at point B, then it buckles into a horizontal oval before falling away, and the dime falls straight down into the bottle.

MATHEMATICS CHALLENGE #34

Show that any convex polygon of area 1 can be enclosed in a parallelogram of area 2.

[DEF: A polygon is convex if the line segment between any two points on or in the polygon is entirely contained inside the polygon.]

[From: Challenging Mathematical Problems with Elementary Solutions, Vol. II, by Yaglom & Yaglom.]

Given a candle that is the diameter of a small birthday candle, but five miles high, how long (in days) would it burn, to the nearest power of 10?

[From: Physics Olympic Handbook]

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