



Director: Richard Waring
Mathematics Coordinator: Richard Delaware
Academic Coordinator: Teddy Lambson

February 1, 1987

Vol. 1, No. 3

SEMESTER GRADES

Well, we've reached the halfway mark, and here are the combined results for all four sections: The HIGH SCHOOL grades, recorded at each school as semester grades, were:

Calculus Physics

Table with 3 columns: Grade, Calculus %, Physics %
High School A's: 56%, 34%
High School B's: 22%, 46%
High School C's: 15%, 11%
High School D's: 7%, 9%
High School F's: NONE, NONE

COLLEGE grades are not officially recorded until the end of the year, but here is an idea of how our students are doing at this mid-point:

Calculus Physics

Table with 3 columns: Grade, Calculus %, Physics %
College A's: 9%, 15%
College B's: 46%, 35%
College C's: 22%, 32%
College D's: 15%, 9%
College F's: 8%, 9%

This total percentage of college A's and B's (55% in Calculus, and 50% in Physics) approximately doubles the usual percentages in these freshman classes at UMKC - and our students are only seniors in high school!

We also extend special congratulations to our current TOP NINE students (Listed below alphabetically by schools):

- Maria Aguilera (Ft. Osage)
Thien Bui (Northeast)
Eugene Bae (Raytown)
Eric Butkovich (Raytown)
Suzanne Breshears (Truman)
John Buckley (Truman)
John Winkler (Truman)
Tim Bacchus (Wm. Chrisman)
Leanna VanTuyl (Wm. Chrisman)

OUR HIGH SCHOOL TEACHERS 1986-87

This month we profile one of our physics teachers, who has been with the MPI all of its three years: CALVIN NELSON from Northeast High School.

At age 19, after only one summer of college classes himself (!), Calvin began teaching grades 1-8 in a one-room country school in Nodaway County. Four years later he was drafted and didn't complete his education until after World War II. At that time he earned both a BA and MA in Secondary Education and eventually received an MST (Master of Science for Teachers) in Mathematics.

He has now been at Northeast for 31 years, teaching mathematics and physics and, at various times, acting as mathematics or science chairman. Presently he is Northeast's Athletic Director and Senior Class sponsor.

We also learned at our fall MPI Open House that Calvin taught the fathers of our current students Amy Modrell (Raytown

South High School) and Brian Zelk (Truman High School) and thereby has become a second generation influence on these families!

In recent MPI instructor evaluations our present students spoke well of Calvin:

"He's great to be around because he talks to you like he cares about your learning."

"He makes me feel as though I am the most important student."

"... he is always there when I need him."

We of course continue to be very pleased to have Calvin's long experience and tempered expertise here at the Institute.

FROM THE PREVIOUS NEWSLETTER:

10, 40, 90, 61, 52, 63, 94, 46, ___ ...

WHAT'S NEXT?

The next number is: 18. Here are four ways to see this. Let x be the last, unknown number above:

1) Symmetry: Moving from the center of the sequence outward (with x in place) we notice that $52 - 52 = 0$, $63 - 61 = 2$, $94 - 90 = 4$, and $46 - 40 = 6$, suggesting that $x - 10 = 8$, hence $x = 18$.

2) Second Differences: In adjacent pairs in the given sequence (such as 10, 40, etc.), subtracting leftmost from rightmost yields the First Difference sequence: 30, 50, -29, -9, 11, 31, -48, $x - 46$. Repeating this idea yields the Second Difference sequence: 20, -79, 20, 20, 20, -79, $x + 2$. Symmetry now

suggests that $x + 2 = 20$, hence $x = 18$ again.

3) Modulo Arithmetic: In a fit of complexity one might notice that $(10 + 30) \bmod 99 = 40$, $(40 + 50) \bmod 99 = 90$, $(90 + 70) \bmod 99 = 61$, ..., and so, $(46 + 170) \bmod 99 = 18$, as desired.

4) THE EASY WAY!: Reversing the digits of the members of the given sequence yields the sequence: 01, 04, 09, 16, 25, 36, 49, 64, ___, i.e., the sequence of perfect squares (!), hence the last is 81, meaning once again $x = 18$.

ENRICHMENTS

On Jan. 7 we once again held the annual MPI Panel Discussion and Reunion, during which some of our former students came to address our present ones on the subject of what college is REALLY like, giving advice from their immediate experience. Their comments were honest, direct, incisive, and often funny. After an hour of the panel, moderated by Teddy Lambson, we adjourned to nearby tables to chat informally with the nearly 30 of our former students who were able to attend.

On Jan 21, Dr. Richard Gentile, a UMKC Professor of Geology, spoke to us on 'Ancient Life Found in Rocks in the Kansas City Area,' showing some fascinating slides of fossilized coral, ferns, shark teeth, and other flora and fauna from a time when the Kansas City area was at the bottom of a shallow sea.

Feb. 4's speaker is still unknown, but TORNADOES will be the topic on Feb. 18, when Preston Leftwich of the National Severe

Storms Forecast Center visits us for the second time (he first came during our first year), bringing a short National Weather Service film on tornadoes, and giving a no doubt enlightening lecture.

Mar. 4's speaker has yet to be announced, but on Mar. 18, Steve Steinacker, Supervisor of Technical Services at UMKC's Truman Campus, will demonstrate to us the marvelous new Apollo Computer Series 3000 Workstations, a collection of up-to-date personal computers capable of superb 2D and 3D graphics, which were recently bought by the UMKC Coordinated Engineering Programs.

Finally, on April 1 and 6 we hope to be a part of the celebration of National Science and Technology Week organized by the Triangle Coalition, consisting of a National Balloon Launch, in which 1000 balloons will be launched by students at 50 national sites. Each balloon will contain a card including the name of the student releasing it, the time, date, and location of release, with a space left for a finder's name and location. It is hoped that if the balloons are found, the cards will be filled in and mailed to the Triangle Coalition Center where the data on the balloon's path of flight will be analyzed and then reported back to each of the 50 participating release sites nationwide.

We have applied to be one of these 50 national sites, and will let you know in the April newsletter how it all turned out.

HIGH SCHOOL VISITS

Every year, beginning in

January, the MPI staff visits each of the 8 participating high schools and gives a slide presentation describing the Institute, what we offer, and what the requirements are for entry. We also make time during these presentations for present MPI students from the high school we are visiting to share their thoughts about the MPI experience.

The students who see these presentations are usually those who have the required background (Alg. I, Geometry, Alg. II, and preferably Trigonometry), and others who have been more-or-less screened for talent and motivation by their counselors or mathematics and science teachers.

After our visits, students interested in applying to the Institute contact their counselors and then are scheduled to take the MAA Calculus Readiness Test, which we administer at each school. If they pass, they are automatically accepted to the Institute. If not, they may still be accepted after we receive copies of their high school math and science grade records and two recommendations from math or science teachers, and they interview with the MPI Director.

We've already visited both Raytown High School on Jan. 21, and Raytown South High School on Jan. 26, and are now scheduling our other visits. We hope to see some of you there!

MORE QUOTES FROM OUR STUDENTS

" MPI offers a challenge to those willing to work a little harder than usual. I have always enjoyed math and science, but they are

even more enjoyable this year because of the faster pace at which they are taught and the higher level of difficulty."

Cynthia Gillespie
Raytown High School
Raytown School District

"After being at the Institute, I can easily say that it gives a great challenge. Plus, it offers free college credit!"

David Taylor
Fort Osage High School
Fort Osage District

"The Institute provides a good stepping stone between high school and college. We're given responsibility, but not more than we can handle. Sometimes when the old calculus book is open with the recommended problems circled, it's hard to sit down and do them, knowing they won't be collected. But that helps me get used to the fact that learning is becoming more my responsibility than the teacher's. Helping to make this jump is one of the many advantages I've found at MPI."

Leanna VanTuyl
William Chrisman High School
Independence District

"My experience at the Institute is very helpful because I think it has prepared me for college by 'forcing' me to get organized and develop study habits. If you get behind you'll never get caught up, and it shows on the tests."

Darrell Kempker
Van Horn High School
Kansas City, MO District

TV 5 VISITS!

On Friday, Jan. 16, the last day of the MPI semester, in the midst of returning exams, we received a visit from a TV 5 newsman, Reed Black, and his cameraman. Apparently they'd read an article in the KC Times about the educational gap between the US and Japan and decided to do a piece on the MPI as a program contributing to bridging that gap.

They spent 30-45 minutes taking some background shots of students in lab, and conducting an on-camera interview with Richard Waring and a brief interview with a couple of students (Rob Crosby from Raytown, and Amy Modrell from Raytown South high schools). The feature, introduced by Wendell Anschutz, aired that evening on the 6 pm Channel 5 news, and though short, will perhaps bring the MPI to the attention of more students and their parents!

(This was NOT our television debut; we were briefly profiled last year by Claire Roberts of Channel 19 on Kansas City Illustrated.)

Editor/Writer: Richard Delaware

Contributing Writer: Teddy Lambson

The MPI Newsletter is published on the first of the month during the months of August, October, December, February, and April at The Mathematics and Physics Institute, 600 W. Mechanic, Independence, Mo. 64050, phone (816) 276-1272. Please address all letters concerning this newsletter to 'Newsletter'.
