INTERCHANGE

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From the Regional Math & Science Center at Grand Valley State University

Our Vision: *Math and Science: Excitement in Learning for Success in Living*

Our Mission: *Provide and coordinate leadership, programs and services to achieve excellence for all in the teaching, learning and application of mathematics and science.*

In this Issue...

Jump into Math and Literature with David M. Schwartz

You are cordially invited to attend the Spring Science and Math Update Seminar on Wednesday, May 5, 2004 where award-winning children's author, David M. Schwartz will present, *"Math + Literature = Learning + Fun!"* at Grand Valley State University, Allendale, MI. The seminar is a recognition dinner and fun presentation for teachers and their outstanding science or mathematics students. This event is co-sponsored by the Regional Math and Science Center (RMSC) at GVSU and Smiths Aerospace.

David Schwartz is the author of How Much is a Million? and about 30 other books, including If You Made a Million, G is for Googol, Q Is for Quark, If You Hopped Like a Frog, and the Look Once, Look Again science series. A very popular speaker in schools and libraries, Schwartz will be speaking on the excitement of big numbers, and connections between numbers, science and stories. "Children love big numbers in the same way they love big animals like dinosaurs and whales," Schwartz says, "and for that reason big numbers are the perfect way to get kids excited about math." In his presentations, Schwartz does just that, using a wealth of visual aids to make all numbers come to life. He leads his audience on a fascinating journey through a world measured in huge sums, from atoms and cells to continents and the cosmos.

As he speaks, Schwartz also emphasizes the importance of numbers in every aspect of our lives, including literature. "Numbers and stories are related to each other in more ways than most people realize," the author declares. "Once children see the connection, they start writing wonderful numerical stories of their own."

Since publication in 1985, How Much Is A Million? has become the classic children's book on large numbers. Illustrated by Steven Kellogg, it has won several awards and has been featured on Public Television's "Reading Rainbow." It was a main selection of the Children's Book of the Month Club. Inspired by Schwartz's book, children in hundreds of schools have engaged "million projects," which often include the collection of a million of something. Students at some schools and patrons at some libraries have attempted to read a million pages (for a million minutes), and many have gained local or national fame along the way.

see "Math and Literature" on page 3

Author David M. Schwartz

Summer Science Adventure Day Camps

The Regional Math and Science Center at Grand Valley State University will offer a series of Summer Science Adventure Camps during the summer of 2004. The camps are designed for students entering grades 4-8. Camps will run July 6-9, 12-15, 19-22, and 26-29, and August 2-5. Tentative times are 9:00 a.m. to 3:00 p.m. Topics include Flight and Space, Digging Rocks, Forensics Science, and Computer Technology. These camps combine classroom and experiential opportunities as students learn key scientific principles and apply them to real world situations. Camps will take place on the Allendale campus of GVSU and at Aquinas College. The camp brochure will be available the end of March on our website at www.gvsu.edu/rmsc/.

INTERCHANGE

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These materials were developed under a grant awarded by the Michigan State Board of Education.

A tentative schedule is as follows:

- Exploring Flight and Space Camp I (session 1) for students entering grades 4, 5, and 6 will be on July 6-9, 2004.
- Exploring Flight and Space Camp I (session 2) for students entering grades 4, 5, and 6 will be on July 12-15, 2004.
- Exploring Flight and Space Camp II for students entering grades 5, 6, and 7 will be on July 19-22, 2004.
- Digging Rocks for students entering grades 4, 5, and 6 will be on July 26-29, 2004.
- Forensics Science for students enering grades 5, 6, and 7 will be on August 2-5, 2004.
- Get with the Program: Technology Class for students entering grades 6 and 7 will be in July 2004 (dates to be announced).

Sign Up for Air Quality Curriculum Workshop

Did you know that many parts of Michigan will be in non-attainment for ozone standards as of April 15th? Do you know where to get materials for students to understand Ozone Action Days? Have you heard about particle pollution? Your students can make a difference if they are informed about air quality problems.

Do you have creative ideas about how to teach air quality in the classroom for grades 6-9? Would you like a sneak preview of the air quality lessons that are being developed for the CMI Michigan Department of Environmental Quality Environmental Education Curriculum Project? If so, please mark your calendar for an interactive workshop on April 26 from 4:00 to 6:00 p.m. at the GVSU Lake Michigan Center in Muskegon. There is a lot to share about air quality issues at this free workshop. We will have the latest updates on Michigan's air quality problems and what this means to west Michigan along with lesson ideas and resources.

Please e-mail Janet Vail at vailj@gvsu.edu or call (616) 331-3048 by April 22 to register for the workshop. If you can't attend the workshop, but would like to be involved in the air quality curriculum project, please let us know.

GLOBE Training Offered

The Michigan Environmental Council, Grand Valley State University (GVSU)/Annis Water Resources Institute and Regional Math and Science Center, and the West Michigan Environmental Council are pleased to offer this popular workshop in "Environmental Education and GLOBE Training" to teachers in our region. This workshop will have three major components: training in the GLOBE protocols for collecting environmental data; instruction in the Murphy Model for Environmental Education; a template for integrating environmental education with other subjects in the curriculum; and an introduction to inquiry-based science instruction, including how to use inquiry within the GLOBE curriculum.

The GLOBE component this year will train teachers in the two most used protocols, atmosphere and hydrology. The atmosphere protocols include weather-related measurements including temperature, clouds, and precipitation. The hydrology protocols focus on water quality measurements. In addition, participants will have the opportunity to choose training in one additional set of protocols: soils, land cover, or ozone. In addition, all participants will be introduced to the new environmental classroom units under development through the Depart-

ment of Environmental Quality of the State of Michigan.

This week-long workshop for middle and high school teachers (grades 5-12) will be held at the Lake Michigan Center of GVSU in Muskegon, MI. Teachers are expected to develop and implement a unit in their classrooms based on workshop materials. Participants must attend the workshop daily, August 9-13 from 8:30 a.m.-4:30 p.m., to receive the GLOBE Program Manual and a $500 stipend. This stipend is contingent upon successful classroom implementation of the training (including evidence of data being entered on GLOBE website). In past years, the payments have been made four to five months following the training because it has taken teachers this long to implement the training.

GLOBE equipment allowance for collecting data to support the classroom unit developed as a result of the workshop is available up to $250.

More information about this workshop as well as the registration and application forms is available on the Regional Math & Science Center website at www.gvsu.edu/rmsc under "Teachers & Administrators, Professional Development Opportunities and Workshops". While there is no registration fee for this workshop, registration is limited. Participants must meet the criterion for selection and submit an application form. Individual teachers may apply for this workshop; however, preference will be given to teams of two or more teachers from a school.

NOTE: The RMSC will not be mailing brochures for this workshop in an effort to cut costs. The brochure is available for download on-line at www.gvsu.edu/rmsc

Questions regarding this workshop may be directed to Karen Meyers, Assistant Director, RMSC, at (616) 331-2515 or meyersk@gvsu.edu.

Math and Literature

continued from page 1

Schwartz's recent book, Q Is for Quark, is a zany, brainy, mind-boggling and amusing romp through the world of measurement. It is written at the upper elementary and middle school level, a higher reading level than his other books except for its companion, G is for Googol: A Math Alphabet Book, which was published to numerous accolades in 1998. His latest book, Millions to Measure, also illustrated by Steven Kellogg, does for measurement what How Much Is a Million? did for big numbers: it renders the subject accessible, mind-boggling, and fun.

As a speaker, Schwartz is entertaining and informative. His presentation makes math and science fun. A New York City native, David Schwarz now lives in Oakland, California. To obtain a brochure for this event or for further information, please contact RMSC at (616) 331-2267 or www.gvsu.edu/rmsc.

Attend the Flinn Chemistry Workshop

The Flinn Foundation Summer Chemistry Workshops are one-week, intensive study workshops that focus on enhancing a high school science teacher's knowledge of using chemical demonstrations, participating in hands-on laboratory activities, and meeting National Education Science Standards for chemistry. The workshops are modeled after the Woodrow Wilson National Fellowship Foundation Torch Program.

The workshops are designed for any high school science instructor teaching chemistry concepts who wishes to learn and practice chemical demonstrations and hands-on laboratory activities. New chemistry teachers are especially encouraged to attend and be exposed to a wealth of tested demonstrations and laboratory activities. More experienced teachers will benefit by being able to improve their demonstration and laboratory skills in addition to learning a few new "tricks" to take back to their classrooms.

The benefits of the workshop are great. The workshop presenters will provide a wealth of teaching materials, laboratory activities, chemical demonstrations, teaching tips, and classroom management styles that the participants can immediately incorporate into their curriculum. All the materials presented at the workshop make reference to science standards and will be provided in an easy-to-use workshop manual. The workshops will offer a forum for high school science teachers to come together to share their experiences, knowledge, and excitement of teaching chemistry. The enthusiasm and love of chemistry experienced at the workshop is contagious and will influence how you teach chemistry for years to come.

For more information and for registration forms visit www.flinnsci.com/Sections/Foundation/documents/info.asp. Mail the registration form and payment to Jan Foulkes, Flinn Scientific Foundation, P. O. Box 808, Batavia, IL 60510.

The workshop is July 12-15 from 8:00 a.m. to 4:30 p.m. and July 16 from 8:00 a.m. to 1:00 p.m. on the Allendale Campus of GVSU. Lee Marek, Jesse Bernstein, and Mike Roadruck are the presenters. The workshop costs $290 and includes continental breakfast, lunch, workshop supplies and manual. Room and board are available at GVSU at a modest cost. Two graduate credits are available. For more information contact Dave Tanis at (616) 331-2238 or email tanisd@gvsu.edu.

SCIENCE AND MATH UPDATE

From Euclid to the Internet: the Search for Prime Numbers

Matt Boelkins, Mathematics Department

The Greek mathematician Euclid lived around 300 B.C. While you probably know Euclid as the founder of Euclidean geometry, he made other wonderful contributions to mathematics. One is the following beautiful theorem:

There are infinitely many prime numbers.

A prime number, of course, is a whole number (larger than 1) whose only factors are 1 and itself. For example, 2, 3, 5, 7, and 11 are all prime. Numbers that are not prime, like 4, 12, and 20, are said to be *composite*. The concept seems simple enough, but prime numbers turn out to be incredibly important: they are the building blocks from which all numbers are created.

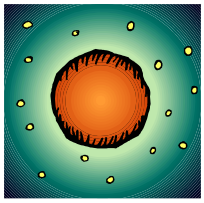
Primes (in particular, large primes) have turned out to play a critical role in our modern electronic world: the field of public-key cryptography relies on using hard-to-factor integers whose factors are large primes. Knowing how to factor a big number (which turns out to be very hard to do) is the secret behind many codes. This idea, among others, leads mathematicians to search for larger and larger primes. Of course, part of the search is just the thrill of discovery. Will I be the person to find the next largest prime?

While Euclid proved that infinitely many primes exist, he didn't provide a formula for how to find them. In the 2300 years since Euclid, no one else has come up with a predictor of the next prime, either. Thus, the process for searching for prime numbers rests on the need to check super large numbers to see if they are divisible by anything else – a task that only computers (as harnessed by research mathematicians) can really tackle.

In the quest for ever-larger prime numbers, there is a special class of primes called "Mersenne primes" that have provided several of the largest primes ever found. A Mersenne prime is a number of the form $2^p - 1$, where p is itself prime. There are many primes p for which $2^p - 1$ is not prime; in fact, there are only 40 known Mersenne primes (and it remains unknown whether there are infinitely many Mersenne primes or not). The most recently discovered Mersenne prime was found just a few months ago on November 17, 2003, by the computer of Michael Shafer: this number is $2^{20,996,011} - 1$, which, if expanded, has over *6 million digits* – a number that, if written out, would fill a 2,000 page book. This, of course, is the world's current largest known prime. From Euclid's theorem, we know that there are still *infinitely many primes larger than this one!*

> **"public-key cryptography relies on using hard-to-factor integers whose factors are large primes"**

You can learn more about GIMPS (the Great Internet Mersenne Prime Search) at www.mersenne.org. Perhaps you and your students will enter the search! Any computer can join the fun, and classrooms all around the country are joining in, both for the opportunity to learn about prime numbers, as well as for the possibility of becoming famous for discovering the next greatest prime. While Euclid knew that there were infinitely many primes, he might have been surprised to know the challenge that "finding the next prime" remains to this day.



A Hole in One

Douglas Furton, Department of Physics

On the 25th of January this year, NASA scored what it called a "300-million mile interplanetary hole-in-one" when the rover Opportunity burned, bounced and rolled to rest in a tiny crater on Meridiani Planum on Mars. The truth is that Opportunity missed the landing site it was aiming for when it was launched seven months earlier by 15 miles. Still, not bad.

As a testament to NASA navigators' ability to guide interplanetary spacecraft, however, another current NASA mission named STARDUST is even more telling. STARDUST is an interplanetary probe that has been winding its

way through the inner part of the Solar System since its launch on February 7, 1999 to rendezvous with a comet named Wild-2 and collect and return to Earth samples of interplanetary and cometary dust.

STARDUST was initially launched into an elliptical orbit around the Sun with an aphelion distance (greatest distance from the Sun) of 2.7 astronomical units (2.7 times the Earth-Sun distance), taking the probe far beyond the orbit of Mars. Then, on January 15, 2001, STARDUST swung back by Earth, passing only 3,700 miles above the southern tip of Africa at a speed of 22,400 miles per hour in order to get a kick into an even larger orbit that put it on track to rendezvous with Wild-2.

After a quiet three-year cruise back to aphelion, things began to happen aboard STARDUST. On November 4, 2004, the probe sped past an asteroid named Annefrank taking more than 70 pictures from a distance as near as 2,000 miles. On January 2, 2004, STARDUST encountered comet Wild 2 just as planned. The much faster moving comet swept to within 150 miles of STARDUST at 13,000 miles per hour, while the probe took pictures and collected samples of cometary debris.

NASA navigators now have STARDUST settled into a new orbit that will cruise the probe back toward Earth over the next 1.5 years. They have planned for STARDUST's 125-pound sample-return capsule to re-enter Earth's atmosphere and parachute to a military test and training range in Utah on January 15, 2006.

Upon re-entry the capsule will be moving at 28,000 miles per hour and the predicted landing area is an ellipse about 20 miles wide and 50 miles long. This, after a journey of seven years and nearly 3.5 billion miles. Now that's a hole in one.

Much more information about this amazing mission, including animations of STARDUST's intricate orbit and complete descriptions of the science experiments it carries, is available at stardust.jpl.nasa.gov.

"Obesity during adulthood is more likely to be seen in low birth weight babies"

Mom – It's all your fault…

Dawn Coe, Department of Motion Science

…well you are at least partially at fault for the obesity epidemic. The levels of obesity are growing at epidemic proportions. Sedentary behaviors are also increasing and contributing to the increased levels of obesity in the United States. (32% of the U.S. is obese). Current research may have elucidated a biological cause from this problem that was previously thought to be due to environmental conditions. Research studies have suggested that the fetal environment and adaptations by the fetus in the womb may be associated with obesity and sedentary lifestyles. Obesity during adulthood is more likely to be seen in low birth weight babies than those who were born at a normal weight. These studies suggest that the fetal environment plays a vital role in the development of disease later in life. It appears that maternal nutritional status during pregnancy may be the culprit. This "fetal programming" that occurs in the womb may alter gene expression that may lead to a person to be predisposed to obesity and/or sedentary behaviors. A recent study using an animal model (rats) looked at the prenatal environment and its role in programming behaviors. The rats were assigned to one of two groups (undernourished during pregnancy and complete standard diet during pregnancy). Offspring of the undernourished mothers were more sedentary than their well-nourished counterparts. This inactive lifestyle led to an increase in maturity-onset obesity in the offspring. Overall, results show that in malnourished offspring there is an increase in sedentary behaviors as well as an increase in overeating, both major contributing factors to obesity. Although it may partially be mom's fault for the obesity epidemic, it is still important to exercise and eat nutritiously to help prevent and decrease the current levels of obesity.

These pages are produced by faculty from GVSU.

Thanks to Science Olympiad Supervisors

Saturday, March 27, 2004 marked the 20th year of the Region 12 Science Olympiad hosted by Grand Valley State University. During the celebration, special recognition was given to the following people who have served as Regional Event Supervisors for at least 15 of the 20 years: Dale Berglund, Ruth Ann Britnall, Todd Carlson, Kevin Col, Dave DeBruyn, Linda Goosen, Charles Knop, Sheldon Kopperl, Ross Reynolds, Gary Richmond, Gary Slykhouse, Jim Strickland, Dave Tanis, Patrick Thorpe, and Gary Tomlinson.

Funding for Region 12 Michigan Science Olympiad has been provided by David Hecht of the Loosemore Foundation, and GVSU. David and his wife, Joyce Hecht, have been proud sponsors of the Science Olympiad Regional Tournament since 1996. Founding members who were also honored are Rose Stein, in honor of the late Professor Howard Stein, P. Douglas Kindschi, Dean of the Math and Science Division, Sandi Bacon, from the GVSU Chemistry Department, Mary Ann Sheline, Director of the Regional Math and Science Center, and Joyce Paggeot, former secretary for the Regional Math & Science Center.

Included in this year's celebration was a special commemorative Science Celebration featuring the physical and chemical antics of Professor Ross Reynolds, from GVSU's Physics Department, Professor Dave Tanis, from GVSU's Chemistry Department, and Professor Sheldon Knoespel, from Michigan State University's Chemistry Department.

The Science Olympiad organization is dedicated to improving the quality of science education, creating renewed interest in learning science and providing recognition of exemplary achievement in science education by students and teachers. Over the years, students who have participated in the spirit of MSO have developed strengths in problem-solving abilities and critical thinking skills, while gaining a deeper understanding of science. These skills follow them in life, influencing graduate studies and careers in science research, teaching, medicine, and other science-related jobs. This year's 20th Anniversary Commemorative Program featured several of these students, tracing their progress from past to present.

Conversations Among Math Colleagues

On Saturday, March 20, 2004, more than 130 mathematics educators representing over 50 institutions and organizations took the opportunity to participate in the conference, *Conversations Among Colleagues: Collaborating to Improve the Mathematical Education of Our Students*. Designed to foster communication among the many parties responsible for the mathematics education of teachers in Michigan, the conference attracted college and university mathematicians and mathematics educators, K – 12 mathematics supervisors, curriculum directors, and classroom teachers who mentor teacher interns.

The keynote address was given by Hyman Bass from the University of Michigan Center for Proficiency in Teaching Mathematics (CPTM). In the work session that followed, using examples from number theory, the group was led in a conversation about how college students learn mathematics and how that learning can be transferred to teaching mathematics to K – 12 students.

Three consecutive sets of concurrent sessions offered participants choices of content organized around the themes of:

- How college students learn mathematics.
- The mathematics K – 12 teachers need to know and how it should be learned.
- The impact of initiatives and directives such as No Child Left Behind, MEAP, and Michigan Framework on the mathematical education of teachers, and Mathematical Education of Teachers Projects around the state.

The conference concluded with remarks by Glenda Lappan from Michigan State University based on the day's activities, with a focus on how future teachers should learn the mathematics they will teach.

The conference was organized by a joint committee of members of the Michigan Mathematics Teacher Educators, the Michigan Council of Teachers of Mathematics, the Michigan section of the Mathematics Association of America, and the Michigan Mathematical Association of Two Year Colleges, with additional support by GVSU's Department of Mathematics, GVSU Division of Science and Mathematics, GVSU Pew Faculty Teaching and Learning Center, Center for Proficiency in Teaching Mathematics at U of M, and MSU Division of Science and Mathematics Education.

CALENDAR OF EVENTS

APRIL

1 Thursday

A seminar on **Soil And Vegetation Responses To Municipal Solid Waste Leachate Applications At The Fenske Landfill** by Neil MacDonald, Ph.D. and Associate Professor at Grand Valley State University, will be presented at 3 p.m. in the Multi-purpose Room, Lake Michigan Center, Muskegon, Michigan. A brief reception will follow the seminar.

13 Tuesday

Building Confidence Through Content Series: Heredity**. For elementary school teachers. 4:30 – 8:30 p.m. Sessions conclude April 20. 303 Henry Hall, Allendale Campus, GVSU. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.**

20 Tuesday

Building Confidence Through Content Series: Solar System, Galaxy, and Universe**. For elementary school teachers. 4:30 – 8:30 p.m. Final sessions. 303 Henry Hall, Allendale Campus, GVSU. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.**

20 Tuesday

Stream Sampling presented by the Educator's Professional Development Institute. Includes chemical, biological, and physical sampling procedures, and more. GVSU Annis Water Resources Institute, Muskegon. Contact Lori Witting at (906) 487-2263 or lori@mtu.edu.

22 Thursday

Free **Earth Day Activities** at the Wittenbach Center in Lowell from 10 a.m. to 12:30 p.m. for 4th graders, home school groups, and parents. Sponsored by the Lowell High School Environmental Club. You must RSVP to Wittenbach Center at (616) 987-1002 to attend.

26 Monday

Air Quality Curriculum Workshop. 4:00 to 6:00 p.m. at the GVSU Lake Michigan Center in Muskegon. Contact Janet Vail at vailj@gvsu.edu or call (616) 331-3048

JUNE

17-18 Thursday-Friday

WMU's **Paper Making in the Classroom** by Dr. David Peterson. For teachers of grades 7-12. Class meets at WMU Parkview Campus, Kalamazoo. 8:30 a.m. - 4:00 p.m. 1 graduate credit hour available. For additional information, call the WMU's Center for Science Education at (269) 387-3337 or e-mail cse@wmich.edu.

21-25 Monday-Friday

WMU's **BioBuddies**, a course in microbiology for elementary and middle-school teachers, by Dr. John Goudie. Class meets at Kalamazoo Area Math and Science Center, 600 W. Vine St., Kalamazoo, MI. 8:30 a.m. - 4:00 p.m. 2 graduate credit hours available. For additional information, call the WMU's Center for Science Education at (269) 387-3337 or e-mail cse@wmich.edu.

21-25 Monday-Friday

WMU's **Watershed Science Education Academy** by Mr. David Krebs and Mr. Jeff Auch. For teachers of grades 6-12. Class meets at Girls Scouts of MI Pine and Dunes, Kiskey Env. Ctr., 1217 E. River Rd., North Muskegon. 8:30 a.m. - 4:00 p.m. 2 graduate credit hours available. For additional information, call the WMU's Center for Science Education at (269) 387-3337 or e-mail cse@wmich.edu.

21-25 Monday-Friday

Workshop on **Getting to Know the Connected Mathematics Project** for teachers and administrators grades 6-8. 8:15 a.m.-4:20 p.m. Michigan State University's Union Building. For more information see www.math.mus.edu/cmp or contact Judith Miller at (517) 432-2870 or miller@math.msu.edu .

28-July 2

WMU's **Crystals, Minerals and Rocks for Teachers** by Dr. John Grace. For teachers of grades 7-12. Class meets at Room 1120 Rood Hall, WMU Campus. 8:30 a.m. - 4:00 p.m. 2 graduate credit hours available. For additional information, call the WMU's Center for Science Education at (269) 387-3337 or e-mail cse@wmich.edu.

JULY

6-9 Tuesday-Friday

Exploring Flight and Space Camp I (session 1) for students grades 4, 5, and 6. Additional details available at www.gvsu.edu/rmsc/.

12-15 Monday-Thursday

Exploring Flight and Space Camp I (session 2) for students grades 4, 5, and 6. Additional details available at www.gvsu.edu/rmsc/.

12-16 Monday-Friday

WMU's **Activities in Outdoor Education** by Mr. Larry Fegel. For teachers of grades 3-9. Class meets at Outdoor Discovery Center, A-4204 56th St., Holland, MI. 8:30 a.m. - 4:00 p.m. 2 graduate credit hours available. For additional information, call the WMU's Center for Science Education at (269) 387-3337 or e-mail cse@wmich.edu.

12-16 Monday-Friday

Flinn Foundation Summer Chemistry Workshop. The workshop is July 12-15 from 8:00 a.m. to 4:30 p.m. and July 16 from 8:00 a.m. to 1:00 p.m. on the Allendale Campus of GVSU. See article on p. 3 for more details. For more information and for registration forms visit www.flinnsci.com/Sections/Foundation/documents/info.asp. Two graduate credits are available. For more information contact Dave Tanis at (616) 331-2238 or email tanisd@gvsu.edu.

Test Environmental Materials!

A select group of teachers, grades 4-9, is being recruited to field test one of five Michigan environmental education units in Fall, 2004, and provide detailed feedback about these units. The unit topics include: Ecosystems (Grades 4,5,6), Water Quality (Grades 6,7,8), Energy and Resources (Grades 6,7,8, 9), Air Quality (Grades 6, 7, 8, 9), and Human Impact on the Land (Grades 5, 6, 7). These units may be field tested by either Science or Social Studies teachers.

All field test teachers will:

- Participate in a 2-day summer workshop (August 2-3, 2004 in Kalamazoo for west Michigan).
- Receive all materials and instruction for conducting the field test.
- Conduct the field test during a two-week period from mid-September through mid-November 2004.
- Receive a $300 stipend ($100 for workshop participation and travel expenses, $200 when field test is complete).

Approximately 100 teachers will be selected to participate, based on grade level and school demographics. Applications must be received by May 1, 2004. For more information contact Michael Libbee, Central Michigan University, (800) 279-1423. michael.libbee@cmich.edu, or Tom Occhipinti, Michigan Department of Environmental Quality, occhipit@michigan.gov.

Chemistry Olympians Advance

Congratulations to the 143 area high school students who competed in the Local Qualifying Exam for the International Chemistry Olympiad hosted by GVSU Chemistry on March 15. The top eight students, coming from East Kentwood, Fruitport, Grandville, Rockford, West Catholic, and West Ottawa High Schools will be competing in the National Qualifying exam on April 16. The top 20 students nationwide will attend a training camp at the Air Force Academy in Colorado Springs in June, and the top 4 from the camp will compete internationally in Kiel, Germany, July 18-27. Thank you, teachers, for challenging your students to succeed in chemistry. Good luck to the top 8!

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