

INTERCHANGE

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Volume 11, Number 1

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...

Steps continues for a third summer and a **Genetic Update Conference**, **NEED workshop**, and **Building Confidence** Workshops are offered this spring. *pages 2-3*

Science and Math Update explores UV effects and the effect of space travel and soda on our bones. *pages 4-5*

Math in Action is scheduled to arrive this month followed by the **Chemistry Olympiad** in March. GVSU's **TRiO** Program is looking for teachers for the summer. Always wanted to travel? Check out a **transit of Venus**. *page 6*

Plan your spring using the **Calendar of Events** on *pages 7-8*

Science Olympiad Celebrates 20th Anniversary!

Saturday, March 27, 2004 marks the 20th anniversary celebration of the Region 12 Science Olympiad hosted by Grand Valley State University. This year promises to be an exciting tournament. 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.

The Loosemoore Foundation and GVSU have been proud sponsors of the Science Olympiad Regional Tournament since 1985. Each year, more schools and more students join in the excitement of learning through competition, resulting in GVSU presently hosting 82 middle and high schools. This GVSU initiative supports the largest Michigan Science Olympiad (MSO) Regional Tournament in the nation. GVSU hosted a successful National Science Olympiad tournament in 1998.

Included in this year's celebration will be a special Commemorative Science Celebration from 3:30 – 4:30 p.m. in the Fieldhouse Arena featuring the physical and chemical antics of Professor Ross Reynolds, from GVSU's Physics Dept., Professor Dave Tanis, from GVSU's Chemistry Dept., and Professor Sheldon Knoespel, from Michigan State University's Chemistry Dept. The public is welcome to attend this fun-filled, special celebration event.

Along with familiar events such as "Egg Drop" from previous years, this year's tournament will feature a new competitive event called, "Storm the Castle" which was written and developed by GVSU's Dr. Todd Carlson of the Chemistry Department. The MSO teams will design, construct, calibrate, and operate a trebuchet type device capable of launching a projectile as far and as accurately as possible using only the energy of falling counterweights.



One Michigan Science Olympiad team's version of a trebuchet device for the event, "Storm the Castle."

See "Science Olympiad" on page 2

STEPS Marches ON...

The Regional Math & Science Center, the Padnos School of Engineering and the Society of Manufacturing Engineers Educational Foundation (SME), announce the third summer of the Science, Technology, and Engineering Preview Summer Camps for girls (STEPS).

STEPS is a residential summer camp opportunity for girls who have recently completed 6th grade and are between the ages of 11-13. Middle school girls who attend camp live on the Allendale campus of Grand Valley State University for one week. STEPS is an opportunity for girls to learn more about what engineers do.

Program activities include designing, manufacturing, and flying radio-controlled airplanes, along with recreational and educational experiences.

This summer's camps will be held the weeks of June 20 -24 and June 27 - July 1, 2004 (Sunday - Thursday). Applicants must have

completed 6th grade by 2004, be female, and reside in Michigan. Further information can be found www.engineer.gvsu.edu/steps or call the Regional Math & Science Center at (616) 331-2267. Participants for this year will be selected at random from all eligible applications after March 15 and notified by April 15.

Teacher Field Trip to Costa Rica

Have you been in a dense rain forest recently? Think about Costa Rica! Have you snorkeled in Caribbean waters? Think about the Islands in Panama! Join Sister Alice Wittenbach, Aquinas College Biology Professor, expert guides in both Costa Rica and Panama, for a tropical ecology adventure of 12 days, 11 nights.

Dates: Thursday, June 17 to Tuesday, June 29. **Places:** 1) Osa Peninsula in Costa Rica, which includes Corcovado National Park, a part of La Amistad, a national treasure of diversity and a primary focus of the Nature Conservancy, and a park which extends into Western Panama. Diversity includes hundred of species of plants and animals (900 species of birds, alone) and 2) the Bocas Islands in Panama, where we will snorkel in Coral Key and Mangrove areas looking at myriad colorful fishes, see red frogs and learn about a major Research Institution there. Our visit will also include a day-long visit to the Embera Indian population and, of course, the Panama Canal. Credit (1-3 hours), if you choose, is available through Aquinas College. Costs will range from \$2200-\$2400.00, which includes round trip airfare from Grand Rapids to Costa Rica, and return from Panama. A detailed itinerary can be made available to you. Contact Dr. Wittenbach at witteali@aquinas.edu, at (616) 632 - 2186, or at Aquinas College, 1607 Robinson Rd, SE, 49506, for

additional information. Information about these areas can be found at www.nature.org. This trip is planned in conjunction with rainforestandreef.org in Costa Rica and in Panama.

Science Olympiad

continued from page 1

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 will feature several of these students, tracing their progress from past to present.

Attend the Genetic Update Conference

On Wednesday, March 3, 2004, the Regional Math & Science Center at GVSU will host a *Genetic Update Conference* featuring the nationally known lecturer, Sam Rhine. The 2003-2004 school year marks the 21st year that Sam Rhine has given his presentations on current research in genetics around the US and Canada. In developing his programs, Sam scours over 1500 scientific articles from more than 100 journals monthly to make sure every presentation has the very latest information. He will also be a featured speaker at MST A in March.

This program, designed for high school students and their teachers, will include up-to-date information on topics such as Pre-Zygotic and Post-Zygotic Reprogramming, Hox Genes and Segmental Determination, Stem Cells for Medical Therapy, Gemellology, and more. Many schools bring their AP biology students to this type of

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conference as well as those students who are interested in careers in medicine or the life sciences.

This all day conference, 8:30 a.m. to 2:30 p.m., will be held in the Cook-DeWitt Center Auditorium on the Allendale Campus of Grand Valley State University. The cost of the conference is \$15 per person (lunch is not included). Additional information about this conference and registration forms are available on the Genetic Update Conference website, www.samrhine.com or by contacting the Genetic Ed Center, (800) 727-2315, srhine@aol.com.

NEED Workshop for Teachers

The Regional Math and Science Center at Grand Valley State University invites upper elementary and middle school teachers to register for an National Energy Education Workshop to be held at the Allendale campus on March 17, 2004. Thanks to the sponsorship of the Dart Foundation and the Michigan Oil and Gas Association, NEED is able to provide free registrations to those who attend. We are able to accommodate thirty registrants on a first-come, first-served basis.

The NEED Project's mission is to promote an energy conscious and educated society. The workshop helps to achieve that mission by addressing the concepts of force, motion, light, sound, heat, electricity, magnetism, and energy transformations through hands-on activities, games, songs, and much more. The session will be held in the Pere Marquette room at Kirkhof Center, with registration starting at 8:30 a.m. and the workshop concluding at 3:00 p.m. A continental breakfast and lunch will be provided.

Participation in this workshop entitles teachers to free use of the

NEED Science of Energy Kit for teaching key energy concepts. Shelly Baumann, a teacher from North Rockford Middle School, and a team of her students, will lead teachers through activity stations, introduce games, plays and songs, and work with experiment kits that help discover these key concepts.

All workshop expenses, including lunch, building substitute costs, and curriculum materials necessary to carry out the activities covered in the training will be provided by Project NEED, with additional support contributed by the RMSC at GVSU.

To obtain more information about the NEED Project, go to www.need.org. To learn more about the workshop being offered at GVSU, contact the Regional Math and Science Center at (616) 331-2267. Electronic forms are available at www.gvsu.edu.rmsc.

Building Confidence Workshops Offered

Join us at the Regional Math and Science Center at Grand Valley State University for a series of workshops designed to give teachers the content knowledge they need to effectively teach elementary science concepts.

Each session is designed to:

- Provide science content that is the foundation for the benchmarks of the Michigan Curriculum Framework.
- Include hands-on activities that can be adapted for classroom use.
- Include discussion and techniques for connecting hands-on experiences with conceptual understanding through the constructing and reflecting benchmarks.

Topics in physical, life, and earth science have been selected and sessions planned around specific

content benchmarks from the Michigan Curriculum Framework as listed below. Faculty from the Integrated Science Program for elementary teachers and Geology Department are teaching this series. Recent MEAP data was used to select topics that would most help improve student performance in science.

- Wednesday, 2/25/04 Ellen Yeziarski, GVSU Chem *Strand IV: Physical Science* Standard 3: Motions of Objects-Elementary Benchmarks 4 & 5
- Tuesday, 3/02/04 Chris Dobson, GVSU Bio *Strand III: Life Science* Standard 2: Organization of Living Things-Elementary Benchmarks 1 & 2
- Wednesday, 3/10/04 Ellen Yeziarski, GVSU Chem *Strand IV: Physical Science* Standard 4: Waves & Vibrations-Elementary Benchmarks 1, 2, & 3
- Tuesday, 3/23/04 Larry Fegel, GVSU Geo *Strand V: Earth Science* Standard 1: Geosphere-Elementary Benchmarks 1, 3, & 5
- Tuesday, 4/13/04 Chris Dobson, GVSU Bio *Strand III: Life Science* Standard 3: Heredity-Elementary Benchmark 1
- Tuesday, 4/20/04 Larry Fegel, GVSU Geo *Strand V: Earth Science* Standard 4: Solar System, Galaxy, & Universe-Elementary Benchmarks 1 & 2

Participants may elect to attend the entire series or select individual sessions that meet their specific classroom needs. All sessions will run from 4:30 - 8:30 p.m. The cost of the workshop is \$20 per session.

For a full description of the workshop and registration form, visit the RMSC website at www.gvsu.edu/rmsc or call the RMSC office at (616) 331-2267 to have a brochure mailed to you. Questions regarding this workshop series may be directed to Karen Meyers at meyersk@gvsu.edu.

UV Effects

Bopi Biddanda, Annis Water Resources Institute

No one doubts that solar radiation is a fundamental force in nature. Topics such as “Ozone Depletion” are in the popular domain today, along with “Climate Change” and “Global Warming”. Ozone functions as Earth’s natural sunscreen by allowing photosynthetically active radiation to pass through while withholding harmful ultraviolet (UV) radiation. The ever-expanding “Ozone Hole” over Earth’s poles is no longer considered a myth - as it was just a quarter century ago. One major consequence of increased Ozone destruction caused by anthropogenic emissions is the enhanced penetration of ultraviolet (UV) radiation into the biosphere. Although life presumably originated in a UV-rich environment of the past, present day life forms, their interactions, and the cyclic/seasonal movement of elements (such as carbon and oxygen) within ecosystems can be adversely affected by increased exposure to UV radiation. Thus the light climate in the biosphere presents a dilemma: We cannot live without enough of it; we cannot live with too much of it!

During the last two decades, at least two earlier books have dealt with the premise that solar ultraviolet (UV) radiation penetrating our watery planet profoundly impacts both the living as well as the non-living components. Today, in an age of rapidly ongoing climate change around the globe, the subject of the linkage between

sunlight and life is a critically important area of emerging interest and research. Therefore, a new book - *UV Effects in Aquatic Organisms and Ecosystems*, compiled by Helbling and Zagarese, is very timely. Their book is volume 1 in the series – Comprehensive Series in Photochemistry and Photobiology – compiled by the European Society for Photobiology.

In the Preface to the book, the editors state that their objective is to provide evidence that UV

One major consequence of increased Ozone destruction ...enhanced penetration of ultraviolet (UV) radiation.

radiation is a major environmental force operating within aquatic ecosystems. The book is divided into five sections: The basics of light in the environment, physics of light, chemistry of light, effects on organisms, and effects on ecosystems. Each section comprises between one and six chapters. The book consists of seventeen chapters that are authored by thirty-one well-known researchers in their respective areas of expertise. The different chapters cover diverse subjects such as: UV as a master modulator influencing ecosystem processes and evolution, planetary UV climatology, penetration of UV in water, kinetics of UV exposure and response, role of UV

in elemental cycles, UV influence on carbon capture and storage, photoactivated toxicity, DNA damage by UV, photoprotective mechanisms in organisms, adaptive significance of UV vision, UV influence on species interactions, UV environments of the geologic past, and UV under current/future climate scenarios. Long after I read this book, several of these emerging areas of research remained in my memory. It is my opinion that the contents of the book do fulfill the objectives set forth in the preface by the editors, by providing ample evidence of the importance of UV-driven processes in the environment.

On the whole, I find this book to be a comprehensive and timely source material for students and researchers interested in the role of UV in the environment.

The book, *UV Effects in Aquatic Organisms and Ecosystems* is edited by E. W. Helbling and H. Zagarese (\$290, 576 pages, published by The Royal Society of Chemistry, January 2003).

Mars and Bust! ... Bone

Steve Glass, Department of Movement Science

As our eyes continue to point outward toward the moon (again) and Mars, visions of humans landing and exploring distant planets occupy our thoughts. Unfortunately, we may not be in the best of shape when we arrive on Mars, and in fact, may have trouble even getting out of bed!

SCIENCE *AND* MATH UPDATE

The problem is not Mars, it's the long trip (6 months) in a weightless environment that has researchers stymied. Data from Skylab, Mir, the International Space Station and a host of shuttle flights have shown that a weightless environment creates a severe case of deconditioning. Research shows that almost immediately upon entering a weightless environment there is a substantial decrease in protein synthesis, thus promoting a loss of muscle mass. In addition, there is a shift in blood volume, where blood pools centrally (rather than in your legs when standing on earth). This shift in fluid causes the kidneys to drain the body of fluid and blood volume. The result is less blood circulating and a reduction in the size of the heart.

Other issues that will face the explorer upon landing on Mars is the loss of balance and orientation control and blood pressure sensors, which will mean that changing posture (reclining to standing) will be a challenge. Even sensing the ground beneath them is compromised after spending extended time in a weightlessness environment.

Most disturbing is the loss of bone that is seen after only short periods of time in space. These losses seem to be permanent, and mimic the loss of bone seen in elderly. If enough bone density is lost, the bone can easily reach a fracture threshold, and break during even minor exertion.

The cure? Right now, exercise seems to fend off much of the losses. Astronauts currently exercise almost 2 hours each day.

Studies show that muscle loss can be minimized. However, bone loss is still prevalent without some type of gravitational loading, so engineers are studying ways to create a gravity environment within the space capsule to allow period exposure. Drug treatment to prevent bone breakdown is also being examined. We'll need to conquer this problem if we are going to make successful ventures beyond our own planet.



research has linked this massive consumption of soda to weakening of the bones



Think Before You Drink!

Dawn P. Coe, Department of Movement Science

Did you know that the average American consumes approximately 55 gallons of soda per year? Current research has linked this massive consumption of soda to weakening of the bones and more seriously, osteoporosis. Osteoporosis is characterized by decreased bone mass and bone mineral density, which typically results in frailty of bones and an increased incidence of bone fractures. There are approximately 10 million Americans afflicted with this

disease, of which 80% are women. A recent study conducted at Tufts University revealed that women who consumed more than 36 ounces of cola per day had a bone mineral density 2.3-5.1% lower than their counterparts who had fewer than 12 ounces of cola per day. This relationship was not found in men. A factor that has been deemed the culprit in lowering bone mineral density is the phosphoric acid contained in cola beverages. Phosphoric acid has a tendency to bind with calcium, making it hard for calcium to be absorbed by bone. Calcium absorption by bone causes the bone to become more dense and stronger. Decreased absorption weakens bones and puts the person at risk for fractures. Osteoporosis prevention should begin early in life. However, the average teenage girl drinks about 2 cans of soda a day. A Harvard study showed that girls who drank soda had triple the risk of fracturing a bone. It appears that even at an early age, the phosphoric acid in soda effects bone density. Ladies, keep this in mind the next time you open a soda!



These pages are produced by faculty from GVSU.

Help the TRiO Program

Grand Valley State University's TRiO Program will be looking for individuals to teach during the six week summer component in June and July 2004. Individuals who would like to receive more information and/or be considered should contact the TRiO office (616) 331-3441 by March 1, 2004. A list of available positions will be sent to those individuals who contact the office and indicate an interest.

Transit of Venus

On June 8, 2004 people in West Michigan will experience (assuming the sky is clear) an event that no human alive today has ever seen—a transit of Venus. This is a wonderful teaching opportunity and to assist educators, the Great Lakes Planetarium Association (GLPA), a regional group of astronomy educators, has produced a DVD detailing historical, education, and observational information for only \$15.00. This stand alone DVD can be used in the classroom as well as the planetarium. For information on this product and for any other information you wanted to know about the transit but were afraid to ask, see www.transitofvenus.org.

Two words of warning: You need safe solar observing filters and you'll need an optical aid to see the event. Here in West Michigan, the transit is already underway at sunrise and will end about 20 minutes later so it is very important to have a clear east-northeastern horizon. In fact, you should watch the sunrise a couple of days before from the location you are observing the event from to insure your horizon is without obstructions. Sunrise on June 8, 2004 is 6:04 EDT here in West

Michigan.

At transit is basically the same as a solar eclipse except, in this case, instead of the Moon getting between the Earth and the Sun, Venus gets in the "way." Because Venus is so far away from the Earth, it will only appear as a small round dot crossing the southern part of the Sun

Math In Action Conference is Coming

The annual Math In Action conference will be held on Thursday, February 26 in the Eberhard Center on GVSU's Robert C. Pew Campus in downtown Grand Rapids and will run from 8:30 a.m. to 3:00 p.m. The theme for this year is "Data Analysis throughout the Mathematics Curriculum."

There will be four sets of concurrent sessions addressing this theme. They will offer teachers the opportunity to experience a variety of interactive projects and activities that other educators have found successful. Each session will offer possibilities from across the K-12 curriculum on a host of topics.

This year we are pleased to have Professor Deborah Ball from the University of Michigan giving an address for all to hear. She is a former elementary teacher who now chairs several national panels and study committees including the Glenn Commission on Improving Mathematics Education for the 21st Century and the National Research Council study panel that produced Adding It Up.

Please consider joining us for an exciting and energizing day consisting of four sessions, hearing Dr. Ball, and a box lunch, all for \$22. (Preservice teachers pay \$11.) A copy of the full brochure can be obtained, along with further information, at the website www.gvsu.edu/math/MathInAction. Your completed registra-

tion form needs to be postmarked by Friday, February 13, 2004.

Chemistry Olympiad Update

The Education Committee of the Western Michigan American Chemical Society will again be offering the local and national qualifying exams for the National Chemistry Olympiad program. The goal of this program is to stimulate interest and achievement in chemistry and to recognize outstanding chemistry students and teachers. For more information on the ACS's National Chemistry Olympiad program, or to view old exams, please go to: www.chemistry.org/portal/a/c/s/_/1/acdisplay.html?DOC=-education\student\olympiad.html.

The local qualifying exam will be held at Grand Valley State University on Monday, March 15. The exam will be given in the Kirkhof Center from 8:30 to 11:00 a.m. Any area high school student is welcome to participate and there is no limit on the number of students from any one school who may take the 110-minute multiple-choice exam.

The top eight students (no more than two students from any one school) will be invited to take the national qualifying exam on Friday, April 16, also at Grand Valley. The top 20 students nationwide will attend a training camp at the U.S. Air Force Academy in June. From there, the top four students will compete internationally in Kiel, Germany.

If your students wish to take the exam and your school has not received a letter announcing the exam, please call or email Julie Henderleiter ((616) 331-2542, henderlj@gvsu.edu) for more information and a registration form. See you on March 15!

CALENDAR OF EVENTS

FEBRUARY

5 Thursday

Wisconsin Fast Plants workshop continues. 4:30-8:30 p.m. in 303 Henry, GVSU Allendale Campus. For additional information, contact Mary Watters, Regional Math and Science Center, (616) 331-2273 or go to www.gvsu.edu/rmsc/2004fastplants.pdf

18 Wednesday

Biological Indicators presented by the Educator's Professional Development Institute. Includes stream tables, erosion, insect morphology, life cycles, and more. GVSU Annis Water Resources Institute, Muskegon. Contact Lori Witting at (906) 487-2263 or lori@mtu.edu.

19 Thursday

Wisconsin Fast Plants workshop continues. 4:30-8:30 p.m. in 303 Henry, GVSU Allendale Campus. For additional information, contact Mary Watters, Regional Math and Science Center, (616) 331-2273 or go to www.gvsu.edu/rmsc/2004fastplants.pdf

20-21 Friday-Saturday

Seventh annual **User's Conference for the Connected Mathematics Project curriculum**. Kellogg Hotel & Conference center at Michigan State University. For more information contact Judith Miller at miller@math.msu.edu or (517) 432-2870.

25 Wednesday

Building Confidence Through Content Series: **Motion of Objects**. For elementary school teachers. 4:30 – 8:30 p.m. Sessions continue March 2, March 10, March 23, April 13, and April 20. 303 Henry Hall, Allendale Campus, GVSU. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.

26 Thursday

Math in Action Conference: Data Analysis Throughout the Mathematics Curriculum. 8:30 a.m.-3:00 p.m. Eberhard Center of the GVSU Pew Campus, Grand Rapids. Additional info in the February *Interchange* or at www.gvsu.edu/math/MathInAction. Registration information available from Mary Watters at (616) 331-2273 or wattersm@gvsu.edu.

27 Friday

Deadline for the **2004 Michigan Statistics Poster Competition**. For additional information visit www.gvsu.edu/stat/statposter/index.htm.

28 Saturday

Learn Winter Tree Identification. 9 a.m. – noon. MSU Biological Station, Kellogg Forest, 7060 N. 42nd St., north of Augusta, MI. Register at (269) 671-2263 or fyevents@kbs.msu.edu.

MARCH

1 Monday

Deadline for applications for the **Mary Jane Dockeray Scholarship**. See Volume 10 Number 8 of the *Interchange* for more details or contact the Regional Math and Science Center at (616) 331-2267.

2 Tuesday

Building Confidence Through Content Series: **Organization of Living Things**. For elementary school teachers. 4:40 – 8:30 p.m. Sessions continue March 10, March 23, April 13, and April 20. 303 Henry Hall, Allendale Campus, GVSU. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.

3 Wednesday

Genetic Update Conference for high school students and their teachers. 8:30 a.m. to 2:30 p.m. at the Cook-DeWitt Center Auditorium on the Allendale Campus of Grand Valley State University. Additional information at www.samrhine.com or (800) 727-2315.

4-6 Thursday-Saturday

Michigan Science Teachers Association Conference in Lansing. Details at www.msta-mich.org.

10 Wednesday

Building Confidence Through Content Series: **Waves and Vibrations**. For elementary school teachers. 4:40 – 8:30 p.m. Sessions continue March 23, April 13, and April 20. 303 Henry Hall, Allendale Campus, GVSU. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.

11 Thursday

Wisconsin Fast Plants workshop concludes. 4:30-8:30 p.m. in 303 Henry, GVSU Allendale Campus. For additional information, contact Mary Watters, Regional Math and Science Center, (616) 331-2273 or go to www.gvsu.edu/rmsc/2004fastplants.pdf

15 Monday

Local qualifying exam for the **National Chemistry Olympiad** program. See article in February *Interchange*. The exam will be given at GVSU's Kirkhof Center from 8:30 to 11:00 a.m. Contact Julie Henderleiter at (616) 331-2542 or henderlj@gvsu.edu.

17 Wednesday

National Energy Education Workshop at GVSU's Kirkhof Center on the Allendale campus from 8:30 a.m. to 3:00 p.m. For more information contact the Regional Math and Science Center at (616) 331-2267. or www.gvsu.edu/rmsc.

20 Saturday

Conversations Among Colleagues Conference: Collaborating to **Improve the Mathematical Education** of Our Students. 8:00 a.m.- 4:30 p.m. GVSU Pew Campus, Grand Rapids. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.

23 Tuesday

Building Confidence Through Content Series: **Geosphere**. For elementary school teachers. 4:30 – 8:30 p.m. Sessions continue April 13, and April 20. 303 Henry Hall, Allendale Campus, GVSU. Contact the Regional Math Science Center at (616) 331-2267 or www.gvsu.edu/rmsc.

27 Saturday

GVSU Regional Science Olympiad Tournament. See article in this issue. Contact Mary Watters at (616) 331-2273 for additional details.

A P R I L

13 Tuesday

Building Confidence Through Content Series: **Heredity**. For elementary school teachers. 4:40 – 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

J U N E

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 miller@math-msu.edu or (517) 432-2870.

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