TEACHING & LEARNING

FIGURES

Department Of Mathematics and Science

Mathematics Newsletter

December 2007

The Department of Mathematics wishes all of our readers a joyous holiday season and a happy and successful 2^{11} — 40.

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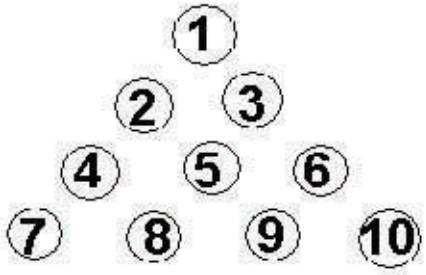
Puzzle of the Month

Triangle Turnover

Place ten coins or counters in the triangular arrangement shown below. By moving **only three coins**, make the triangle point downward.



(Answer next month)

Moody's Mega Math (M^3) Challenge

The 2008 Moody's Mega Math Challenge (M^3 Challenge) will take place on the weekend of March 8-9. Scholarships ranging from $5,000 to $20,000 will be awarded to teams of high school juniors and seniors for excellence, creativity, and originality in quantitative and qualitative reasoning. Teams consisting of a coach and three to five students can be registered online at http://m3challenge.siam.org/register/. Deadline for registration is March 3. All information about the Challenge including registration information and online form, complete rules and guidelines, sample problems, and Challenge problems from the past two years with winning papers can be found at http://m3challenge.siam.org.

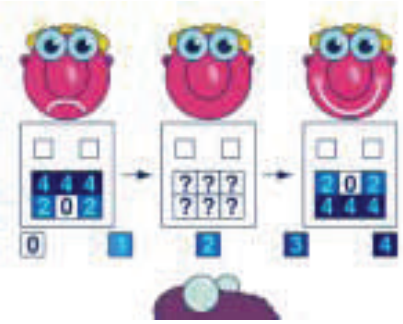
About *Figures*

We chose the name because it refers to numbers, but also much more: there are geometric figures, historical figures, figure drawing and figure skating, and especially thinking (it figures!). Our goal is to provide you with information that is as timely and useful as possible, aimed at the entire Pre-K through 12 New York City mathematics community. Plus we'd like to provide you with food for thought, including a puzzle every month (with the answer published the following month). If you do not currently subscribe and would like to get on our e-mail distribution list, please write us at rschwarz@schools.nyc.gov along with any questions, comments or suggestions you may have.

Website of the Month

Figure This!

Figure This! Mathematical challenges for families provide interesting math challenges that students can do at home with their families. Each challenge features a description of the important math involved, a note on where the math is used in the real world, a hint to get started, complete solutions, a "Try This" section, additional related problems with answers, questions to think about, fun facts related to the math and resources for further exploration.



Click on http://www.figurethis.org/index.html

NYC STUDENTS MAKE GAINS ON 2007 NAEP TESTS IN MATH

New York City students made impressive gains on the 2007 National Assessment of Educational Progress (NAEP) tests, with particularly significant progress achieved by 4th graders in mathematics compared to their peers in other cities and by Black 4th-grade students in both reading and math. Overall, 79% of New York City 4th graders performed at or above basic levels of achievement on the math exam, nearly equaling the 81% average nationally. This performance represents a six percentage point gain since 2005, and a nearly 12 percentage point gain since 2003, when Mayor Michael R. Bloomberg and Schools Chancellor Joel I. Klein introduced the Children First reforms. New York City 8th graders also made progress in math, with 57% performing at or above basic levels of achievement, an increase of three percentage points from the NAEP exam in 2005, when it was last given.

Although the achievement gap among ethnic groups remains large, this year's NAEP math results reflect New York City's significant progress in narrowing that gap. The City's Black and Hispanic 4th graders outperformed similar students in "large central" cities (cities with a population of 250,000 and above) nationwide, and among the 11 urban districts—including New York City—that participated in the NAEP Trial Urban District Assessment (TUDA). In 4th grade, 72% of the City's Black students scored at or above basic levels in math, a gain of 14 percentage points since 2003. By comparison, 58% of 4th-grade Black students in other large central cities and 63% nationally scored at or above basic levels in math. Black 4th-grade students ranked second among their peers in TUDA districts in both their level of achievement and gains in math.

Additionally, 74% of Hispanic 4th graders achieved at or above basic levels in math, a 14 percentage point gain since 2002. By comparison, 66% of Hispanics in other large central cities and 69% nationally scored at or above basic levels. Hispanic 4th-grade students ranked fifth among their peers in TUDA districts in their level of achievement and third in gains.

2008 T³ International Conference
February 29-March 2, 2008
Hyatt Regency – Dallas

The 2008 T³ International Conference in Dallas presents professional development and networking opportunities for middle grades through college math and science teachers. The two-and-a-half-day event (their 20th anniversary conference) offers an opportunity to build your teaching skills, enhance your curriculum and lead your students to higher achievement, all by learning to integrate the latest TI technology into your classroom. There will be more than 400 sessions to attend, filled with hands-on activities and led by some of the most respected presenters in math and science education. For more information, visit http://education.ti.com/educationportal/sites/US/nonProductMulti/pd_conferences_dallas.html

December Birthday

Isaac Newton ***December 25, 1642***

In mathematics, Newton shares the credit with Gottfried Leibniz for the development of the calculus. He also demonstrated the generalized binomial theorem, developed the so-called "Newton's method" for approximating the zeroes of a function, and contributed to the study of power series. (from *Wikipedia*)

Per-Session for Scoring Regents and Grades 3-8 Math Exams

Postings #64 and #65 have just come out from the Division of Assessment and Accountability for teachers and administrators, advertising per-session availability for scoring of the Regents and the grades 3-8 state tests. Applications can be downloaded here: http://schools.nyc.gov/NR/rdonlyres/4505DB19-8089-4CC5-A47F-BCDA2FB6FE73/0/PSVacCirc62thru65PostedNovember272007.pdf
While we don't have any further details, we do know that the deadline for submission of applications is January 2.

German Polyhedra Stamps

Solution to last month's puzzle Digit Decoding):

Probably the most common approach is to begin with a simple solution, usually 9,000,000,000; this is incorrect, since the first digit does represent the number of zeros but the last digit (which represents the number of nines) is not zero. However this effort does establish the useful notion that the most common digit is pretty likely to be zero. And with further thought some people come to the realization that the sum of the digits would have to be ten. (Can you figure out why?) So the next attempt is usually to adjust for the first digit, for example 8,000,000,010 which is still not correct; though it does account for the number of zeros and the eight, now we've introduced a 1 which must be accounted for. But this produces a delicious paradox: by placing a 1 as the second digit we've changed the number of ones in the solution! And like many paradoxes this one brings us to a better understanding. For if there have to be at least two ones, there has to be at least one two and some number of zeros. 6,210,001,000 meets these conditions. One final question: I've got a hunch that this is the only solution, but can think of no convincing reason why it should be. Does anyone have another solution or a plausible explanation as to why this one is unique? Contact me at rschwarz@schools.nyc.gov

SED Sets Date of New Integrated Algebra Regents Exam

Memo from SED: "…We will be administering the Regents Examination in Integrated Algebra on the morning of Tuesday, June 17, 2008. This will be the only State examination administered that morning. This additional half day of testing in the June examination period will aid in the implementation, standard setting and subsequent examination score validation studies associated with the implementation of the three new Regents Examinations in mathematics being phased in, one new examination per year, over this current and the next two school years. The Department will not be adding any extra time beyond this additional half day of testing to either the June 2009 or June 2010 examination periods as the new Regents Examinations in Geometry and Algebra 2 / Trigonometry are phased in. It is our intention that the first time each of these examinations is administered it will be on the first day of that testing session.

All schools administering the Regents Examination in Integrated Algebra in June 2008 will be participating in a post-operational score collection for standard setting this examination. Schools will ship their scored answer sheets to the Department's contractor for score collection and standard setting by handing them to their UPS delivery person on Wednesday, June 18, 2008. Administering the Regents Examination in Integrated Algebra on Tuesday morning will help to facilitate the prompt submission by schools of their scored answer sheets for the score collection. With the cooperation of all schools, the Department will be able to post the conversion chart for Integrated Algebra on its web site by the Rating Day, Thursday, June 26, as schools have requested. A memorandum detailing the procedures necessary for the administration and scoring of this June 2008 examination will be provided to school administrators later this fall." Link to Schedule: http://www.emsc.nysed.gov/osa/schedules/june08.pdf

Quotes of the Month

...it is the glory of geometry that from so few principles, fetched from without, it is able to produce so many things.

Sir Isaac Newton
Mathematical Principles of Natural Philosophy
Preface to the First Edition

Geometry is the art of correct reasoning on incorrect figures.

George Polya
How to Solve It
(page 181)

Upcoming Workshops

Our department is offering numerous mathematics workshops in the next several months. Here are the details:

Elementary Schools

Taking a Deeper Look at the Assessment Components of the 3rd Edition of Everyday Mathematics, Session 2
(Target Audience: Coaches who attended Session 1 in November, Grades K-5)

Prerequisite: Taking a Deeper Look at the Assessment Components of the 3rd Edition of Everyday Mathematics, Session 1

This workshop is a continuation of *Taking a Deeper Look at the Assessment Components of the 3rd Edition of Everyday Mathematics, Session 1*. In addition to looking at the Everyday Mathematics grade-level goals and the New York State Standard grade level performance indicators, participants will also spend time looking at the Acuity System to learn how this assessment program can assist teachers in making informed instructional decisions while using Everyday Mathematics. The Quality Review process will also be discussed. Each participant will receive a CD with the presentation materials. No food will be provided.

Tuesday January 8 9:00 a.m. - 3:00 p..m.

Location TBA **Presenter:** TBA **Cost:** $125 **Max. No. Participants:** 40 **Contact:** Lisa Emond at lemond@schools.nyc.gov

To Register: Protraxx **FAMIS Item Number:** TLMATH033

Pre-Kindergarten Everyday Mathematics: Mathematics Around the Classroom, Session 2
(Target Audience: Pre-Kindergarten Teachers who attended Session 1 in October or November, 2007)

Prerequisite: Pre-Kindergarten Everyday Mathematics: An Overview, Session 1

This workshop focuses on *Mathematics All Around* to help teachers become more familiar with child-initiated activities and explorations. Mathematical opportunities naturally occur throughout the day as Pre-Kindergarten children work and play at school (i.e., Art, Science, Dramatic Play, etc.). Participants will have an opportunity to do several interactive Everyday Mathematics Pre-K activities and will identify the mathematics embedded within these activities. Participants will also discuss questioning techniques, "kid watching," and ways to engage young children in meaningful mathematical conversations. Each participant will receive a book. No food will be provided. Materials to bring: Pre-K Teacher's Guide to Activities and Pre-K Assessment Handbook.

Choose one: **Three dates in January TBA** 9:00 a.m. - 3:00 p.m. Location TBA

Presenter: Debbie Leslie, Author of Pre-Kindergarten Everyday Mathematics 3rd Edition-UCSMP; Sandra Jenoure, Wright Group/McGraw-Hill Consultant

Cost: $125 **Max. No. Participants:** 30 **Contact:** Lisa Emond at lemond@schools.nyc.gov

To Register: Protraxx **FAMIS Item Numbers:** TLMATH034 (1st date); TLMATH035 (2nd date); TLMATH036 (3rd date)

Middle Schools

Level One Exemplars Professional Development – Introduction
(Target Audience: Mathematics Coaches, Mathematics Lead Teachers, and Supervisors, Grades 3-8)

How do we give each student individual attention? Capturing and celebrating individual mathematical goals met by students is essential to their personal growth. Participants in this workshop will learn to effectively analyze students' mathematics work in a way that will individually communicate to their students what is expected, and how effectively each student has meet that expectation. Analysis will be based upon holistically-scored student work samples correlated to Impact Mathematics in grades 6, 7, and 8. Effective tools and strategies will be explored to help teachers develop lesson plans based on students' work.

Friday January 25 8:30 a.m. – 3:30 p.m.

JHS 167M 220 East 76th Street

Presenter: Jacqueline Labate, Exemplars **Cost:** $200 **To Register:** Protraxx **Contact:** Elaine Carman at ecarman@schools.nyc.gov **FAMIS Item Number:** TLMATH037

Supporting Teachers in the Implementation of Impact Mathematics
(Target Audience: Mathematics Coaches, Mathematics Lead Teachers, and Supervisors, Grades 6-8)

Participants in this workshop series will explore the sixth, seventh and eighth grade Impact Mathematics core curriculum and develop strategies to differentiate instruction for all students as they progress through the course work. Pacing will be reviewed, assessments will be explored, and the various component pieces of Impact Math will be integrated to provide models of support that should be delivered to the math teachers in the participants' schools.

Tuesday December 11, Wednesday January 30, **Tuesday February 26** Time: TBA

Dr. Charlotte K. Frank Education Center, CCNY 138th Street & Convent Avenue NAC Building Room 3/218

Presenter: Donna Davis, Glencoe, McGraw-Hill **Cost:** $200 **To Register:** Protraxx **Contact:** Elaine Carman at ecarman@schools.nyc.gov **FAMIS Item Number:** TLMATH038

The Nature of Mathematical Tasks: Learning to Think, Reason, and Problem Solve
(Target Audience: Mathematics Teachers, Coaches, and Assistant Principals, Grades 6-8)

This is a series of two all-day workshops, where participants will explore, analyze, and categorize middle school mathematics tasks. Participants will develop a lens for high level tasks in mathematics. Moreover, mathematics tasks from the New York State Middle School Mathematics Assessments will be discussed in terms of their cognitive demands on students. Breakfast will be included.

Tuesdays January 8 and 22 9:00 a.m. – 3:00 p.m.

Dr. Charlotte K. Frank Education Center, CCNY 138th Street & Convent Avenue NAC Building Room 3/218

Presenter: Dr. William L. Farber, NYCDOE Director, The

Dr. Charlotte K. Frank Mathematics Education Center

Cost: $170 **Max. No. Participants:** 25 **To Register:** Protraxx **Contact:** Dr. William Farber at WFarber@schools.nyc.gov **FAMIS Item Number:** TLMATH025

How to Use the TI-34II Scientific Calculator as a Teaching and Learning Tool in the Middle School Mathematics Classroom
(Target Audience: Mathematics Teachers, Coaches, and Assistant Principals, Grades 6-8)
This is a series of two all-day workshops, where participants will explore the effective uses of the scientific calculator (TI-34 II) in the middle school mathematics classroom. Activities will include how the calculator can serve as a learning tool for students as well as a teaching tool for teachers. Test items from the New York State Middle School Mathematics Assessments will be explored and discussed in terms of calculator use. Breakfast will be included.

Fridays January 11 and 25 9:00 a.m. – 3:00 p.m.

Dr. Charlotte K. Frank Education Center, CCNY 138th Street & Convent Avenue NAC Building Room 3/218

Presenter: Dr. William L. Farber, NYCDOE Director, The Dr. Charlotte K. Frank Mathematics Education Center

Cost: $170 **To Register:** Protraxx

Contact: Dr. William Farber at WFarber@schools.nyc.gov **FAMIS Item Number:** TLMATH026

Using Released Test Items to Improve ELL Mathematics Instruction
Middle Schools / December 20
Middle school math teachers of ELLs, math lead teachers, and math coaches can attend a three-session workshop series that focuses on how to identify the language and cognitive demands of state math assessments for different strands and grade levels. The first session, scheduled for **December 20**, 8:30 a.m.-3:00 p.m. at the Hispanic Federation (55 Exchange Place, Manhattan), will provide participants with the information and skills necessary to interpret released test items so that they can be used to maximize ELL achievement. Participants will develop approaches to pedagogy, curriculum design, and teacher development appropriate for ELL contexts. The conference costs $225 per participant (FAMIS #TLELL0032) but is free for middle school initiative schools. For more information, contact Dionisio Rodriguez at DRodrig10@schools.nyc.gov or (212) 374-6673.

Mathematics workshops on *Exemplars* (Level 2)
Middle Schools / Events: December 8, January 26 and March 8
Level Two *Exemplars* Professional Development will take place on **December 8, January 26** and **March 8** from 9:00 a.m. to 3:00 p.m. at Stuyvesant High School. In order to participate in this series, participants must have participated in the Summer 2007 or November 6 Level One *Exemplars* professional development**.**
Participants in this series will continue to explore the use of *Exemplars* to reinforce the mathematics instruction at the middle school level. Student work samples correlated to grades 6, 7, and 8 will be investigated. Additional training will include the examination of the work of the participants' students and the development of instructional plans based upon the work of individual students. Work will focus on intervention strategies to complement the instructional model. Registration for this program must be completed on Protraxx at http://pd.nycoit.org and paid for on FAMIS, item number TLMATH001. For additional information contact Elaine Carman at Ecarman@schools.nyc.gov.

High Schools

Brain Research: How Students Learn Mathematics
(Target Audience: Mathematics Teachers, Coaches, and Assistant Principals)
Neuroscience, like pedagogy, looks at learning but from a substantially different point of view. This difference can be illuminating and exciting in its implications for classroom practice. In this session, participants will explore the latest research in neurobiology; the emphasis will be on the practical applications of this research to math instruction. In addition, participants will become familiar with the latest research on how people learn mathematics and will explore practical applications, as well as the implications in creating an enriched environment in math classes.

Mondays December 17 and January 14 9:00 a.m. – 3:00 p.m.

Charlotte K. Frank Mathematics Education Center CCNY (NAC Building Room 3/218) 138th St. and Convent Ave.

Cost: $175 Contact: Miguel Cordero, mcordero@schools.nyc.gov

To Register: Protraxx FAMIS Item Number: TLMATH027

Breakfast will be included.

Integrated Algebra
(Target Audience: Mathematics Teachers, Coaches, and Assistant Principals, Grades 9-12)
This is a series of three all-day workshops where participants will explore the wealth of ancillary materials which accompany the new Integrated Algebra book, including transparencies, graphing calculator resources, class sets of manipulatives, Spanish-language materials, review book, workbooks, assessment options and especially the new online resources. In addition, ExamView, TeacherExpress, and other technology that is now a part of daily instruction will be reviewed. They will also plan instruction for the next three chapters and practice pedagogical strategies (e.g., Think-Pair-Share, Numbered Heads, Jigsaw) to better reach their students. Breakfast will be included.

Tuesdays December 11, January 15 and February 5, 9:00 a.m. – 3:00 p.m.

Charlotte K. Frank Mathematics Education Center CCNY (NAC Building Room 3/218) 138th St. and Convent Ave.

Presenters: Dr. William L. Farber, Director, Mathematics Education Center and Gerald Haber, Prentice Hall Mathematics Consultant

Cost: $255 To Register: Protraxx Contact:Dr. William Farber WFarber@schools.nyc.gov FAMIS Item Number: TLMATH024