How to run a teacher's math circle

The American Institute of Mathematics

The following compilation of participant contributions is only intended as a lead-in to the ARCC workshop "How to run a teacher's math circle." This material is not for public distribution.

Corrections and new material are welcomed and can be sent to `workshops@aimath.org`

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Chapter A: Participant Contributions

A.1 Adams, Vicki

My interest in Teachers Circle is multifaceted. A jack-of-all-trades or a utility player might be the best description of the role that I will play in the Teachers Circle Group at Washington University in St. Louis, Missouri.

My formal education is in Elementary Education. I have a Masters Degree and additional Gifted and Talented (K-12) Certification. I taught third grade for one year, fifth grade for five years, and I have been a facilitator of gifted and talented children for the past three years. My position as a gifted facilitator gave me the opportunity to form a math club to work with kids who like and dislike math. However, I believe it is my work with a nonprofit organization that has given me this opportunity, and I look forward to performing any role needed to ensure the success of the Teachers Circle.

The nonprofit organizations mission is to open a math center that will provide students with mathematical experiences from interactive full body exhibits and life-size manipulatives. The goal is to become a facility where kids learn to love math. The plans are to locate the center in a school district with a 75% population of underrepresented students. In fact, the five school districts that surround the math centers proposed location have an average underrepresented population of 87%.

In closing, I am not certain as to the groups biggest challenge or what the easiest aspect will be in starting this Teachers Circle, but the product of what we do should always be the sum of making a difference.

A.2 Alibegovic, Emina

I received a Ph.D. in mathematics in 2003 at the University of Utah under the supervision of Mladen Bestvina. After finishing my degree I moved to Ann Arbor as a T.H. Hildebrandt Research Assistant Professor. My research is in geometric group theory, but in last couple of years I have become increasingly interested and involved with teacher education. To further pursue these interests I have accepted a position at the University of Utah to work in their mathematics education program.

Collaboration with in-service teachers is a part of my responsibilities that I am looking forward to, and this is how I came to be connected with Teachers Circles. My expected role is to provide math content for the group, and since I have not done anything remotely similar to this before, this will be my biggest challenge. I expect to get familiar with the resources that others have used, and to search the literature before the meeting. I view the meeting at AIM as an opportunity for me to learn more about the Teachers Circles, the teachers who will be participating in my group, what they find challenging and consequently how and which materials should be chosen. I expect that I will also be involved in leading the problem-solving sessions, and this meeting offers a great opportunity of seeing sessions led by others. I am further hoping to incoorporate techniques used in these sessions into courses for pre-service teachers in hope that this will encourage them to join a similar group once they start their own careers.

A.3 Benson, Steve

As a former university mathematician and mathematics educator, I've worked a lot with inservice and preservice teachers in and out of the university classroom. Since joining EDC nearly 7 years ago, I've spent most of my time writing and facilitating content-based professional development materials for mathematics teachers. One project led to the publication of "Ways to Think About Mathematics: Activities and Investigations for Grade 6-12 Teachers," available through Corwin Press, while another is still in production (preliminary drafts available at http://www2.edc.org/connect). I was also involved with "Problems with a Point," an online, searchable database of focused problem sequences for middle and high school students, as well as a number of research projects.

My participation in the workshop is part of "Focus on Mathematics (FoM)," our NSF-funded Mathematics Science Partnership. I have worked with a number of teacher study groups in the three years of the project and am very interested in learning about ways to sustain these groups when FoM funding ends. I think Teacher Circles provides an exciting opportunity to achieve that goal.

A.4 Bohme, Virginia

My role will be to help schedule coordinate Circle Workshops here in Tucson. Ive heard of several different Circle models. I would like:

an overview of workshop types

resources for good problems

tips for creating successful workshops

sample agendas

anything else you know will be helpful

A.5 Carlson, Nate

A proposal for a teacher's circle at the Univ. of Arizona is in its beginning stages. As a teaching postdoc at the U. of A. I will contribute to the project of getting the circle off the ground. As such, this workshop provides an excellent opportunity to learn more about creating such a circle. I have worked with a math circle at a junior high in Lawrence, Kansas, and saw an inspirational talk by Paul Zeitz (Univ. of San Francisco) at the AMS/MAA conference in New Orleans. This motivated me to explore math circles in more depth and to become involved in creating one. In particular I'm interested in the model the San Francisco Math Circle provides, encouraging participation of underrepresented groups by forming strong relationships with teachers.

A.6 Chevaire, Donna

We currently have math study-groups in our district that are co-led by District teachers and mathematicians from area Universities. Our teachers are very enthusiastic and feel that they have deepended their content knowledge. We hope to find a way to continue a similar experience for our teachers when the grant ends. I would be willing to involve other districts in organizing Math Circles. I am a member of the MA DOE Math Liaisons' group which is a group that meets monthly and has representatives from the urban districts in MA including: Boston, Brockton, Cambridge, Chelsea, fall river, Fitchburg, Framingham, Lawrence, Lowell, Lynn, New Bedford, Pittsfield, Revere, Springfield, and Worcester. As District Mathematics

Principal I have contact with the Principals of all of our schools and with the math coaches as well as the teachers.

I would like to understand the logistical structures for Math Circles so that I will be able to speak with other administrators, coaches and teachers to create and sustain Math Circles.

A.7 Cottle, Ormond

I would like to develop forums for teacher's in our district to really analyze the national standards and get into developing engaging lessons especially for our struggling math students.

A.8 Davis, Tom

I will be one of the leaders of the workshop. Last summer I helped organize and run the first Teacher's Circle at AIM and have met with the teachers monthly throughout the school year as a continuation of the initial week.

I have led dozens of sessions of traditional math circles for students in the San Francisco bay area for nine years (we have four bay area math circles now) and have helped organize the circle at San Jose State University.

I was trained as a mathematician (BS from Caltech and PhD from Stanford) and taught college math for a couple of years before I took a post-doc at Stanford in the Electrical Engineering department and moved from there to do computer engineering at Silicon Graphics. I retired about 5 years ago, and that has allowed me to spend more time as a volunteer in mathematical education related activities.

The Teacher's Circle that we started last summer has been quite successful, and I would love to see the same thing happening in other parts of the country. I'm looking forward to working with all the teams to make them as successful as possible.

A.9 Dunbar, Steve

In the Fall Semester of each year, I teach a course on mathematical problem-solving to in-service middle-level teachers. The course covers topics in geometry, number theory, algebra, counting and probability. As such, I am interested in extending teachers' learning and problem solving ability to a context beyond the classroom. I believe that the heart of mathematics is i problem solving at all levels. I am interested in fostering that wide conception of mathematics, as well as the specific crafts of problem-solving.

I am also the Director of the Mathematical Association of America's American Mathematics Competitions program. The AMC creates, distributes, scores, and reports on mathematics problem-solving contests ranging from middle-school level up through the USA Mathematical Olympiad. The AMC is also the sponsor of the USA team to the annual International Mathematical Olympiad. As such, I have an interest in fostering teacher interest in mathematical problems solving, teaching problem solving and rich mathematical competitions. I want to use the opportunity to attend the workshop to find out what resources teachers need for students to participate successfully in mathematics competitions.

A.10 Ellison, Caryn

I have taught our 5-6 gifted and talented class for over twenty years and have always been interested in challenging my most gifted math students. I also want to keep my own

skills sharp and my mind in good working order! I am part of a team who is coming to learn more about the Teacher Math Circles and to think about how this might fit in with the professional development offerings in our area. The teaching staff in our system is aging, and the retiring boomers are being replaced by a lot of bright, young talent coming right out of college. It's fun to see the energy and openness to new ideas that comes with those teachers.

Since I am unfamiliar with the Teacher Math Circles curriculum, I cannot discuss what I will bring to the table...except an open mind and a willingness to learn. AND maybe use my new laptop computer!

It's been too long since I've spent time with colleagues from across the country, and I'm anxious to talk with others and find out what is happening educationally in the different regions.

A.11 Fay-Zenk, Mary

Mary Fay-Zenk, presently serving as the Assistant Principal of Miller Middle School in the Cupertino Union School District, has taught mathematics to middle school students for over twenty years. For the past fifteen years, students at Miller have been involved in math contests and programs, performing particularly well in Mathcounts and in the American Mathematics Competitions. Her ongoing interest in providing quality, meaning-centered mathematics instruction and challenging mathematical experiences for students has prompted her to become involved in several programs that make it possible for middle school teachers to explore problem solving more deeply and to learn mathematics beyond the standard curriculum.

A.12 Graupner, Susan

Sue is currently serving as the district secondary math curriculum and assessment coordinator for Lincoln Public Schools. She is an experienced classroom teacher and has teaching experience from elementary, middle, high school, and college teaching. In 1995 she was selected to be a UNL Math Fellow where she opened the doors for teaching and communicating key educational issues between the LPS and UNL professors. As a math coordinator, Sue oversees the development and implementation of criterion referenced assessments that are used for reporting State Standards, AYP, and the districts math graduation requirement. In addition Sue has been instrumental in moving the math department into the implementation of Professional Learning Communities and working with Staff Development. Her expertise and relationships with teachers has provided a model for the district in working with small teams of teachers in the areas of teaching and learning.

Lincoln Public Schools has ten middle schools and six comprehensive high schools. Approximately 33,000 students are enrolled and 2,900 teachers are under contract K-12.

A.13 Janota-Bzowski, Marek

I'm not sure how I can contribute - I do know that I have been looking for opportunities to teach investigative technique to students and have cried long and hard over the lack of time to give this serious consideration within the time constraints of the academic year. Moreover, getting students in seventh grade who do not know how to conduct an investigation without aiming for the answer and dusting off their hands fills me with dismay. I think it incumbent on all fifth and sixth grade teachers, as well as seventh grade teachers to promote investigations

as exercises in logic and understanding. My aim with participation in the Teachers Circle is to formulate a plan of attack and to campaign by which I can spread the good word around my local city. Private school teachers around me seeem to have done it and I wonder why my colleagues in the inner city statre system have not. Are they too timid or do they not have the necessary skills? Are the kids to unruly, or do the teachers not have the time?

I spent my first fifteen years in teaching (as a late starter) in West London in a multi-cultural, multi-ethnic comprehensive school which was a really liberal environment. A great deal was achieved there; a lot of success was met amd there was a pervasive optimism that somehow ensured that everyone gained some sort of certification, especiallly low-achievers, while the bright young things went on to taste mathematical superstardom by way of becoming national competition winners. The six years after that were either squandered teaching kids-at-risk, or were the repayment of my debt to society. Either way, it was a thankless task that I was involved in for much too long, hence, my move to MA to begin anew, I find muself facing the kinds of hurdles overcome in the UK some ten years previously, what with the education funding issues, inclusion issues, and the search for time for real teaching instead of the need to satisfy the thirst for position in MCAS-generated league tables.

I wish to carve myself a role in MA education - this workshop may help point me in the right direction. I will be a follower until I feel sufficiently confident to lead.

A.14 LaRose, Wendy

I have taken an interest in the AIM workshop because I believe wholeheartedly in the idea of Teacher Circles. We have talked for years about getting area teachers together for this exact sort of thing. I am excited about having organizations, like Washington University and AIM, interested in orchestrating such an opportunity.

I am a sixth grade teacher and we are wrapping up our fourth year using the Connected Math Program. We shifted to our first NCTM standards based program approximately 10 years ago. I am curious whether that may stir up controversy given the diverse demographics of this workshop.

My teaching certification is in Elementary Education with no specific focus on mathematics. I began teaching foru-five subject areas and over the last few years have begun to focus on mathematics. I now teach four heterogeneous math classes daily. After 15 years away from college level courses, my skills are certainly rusty. I enjoy problem solving and I am excited about revisiting higher level math concepts. I am especially excited to learn about Teacher Circles and eager see what comes of Teacher Circles in St. Louis.

A.15 Little, Kate

Having grown up in Southern California, my degrees include a B.S. from Harvey Mudd College and an M.B.A. from the University of Utah. Currently, I volunteer extensively in the Salt Lake City schools as a math coach and a math advocate for gifted students.

Our application for the Teachers' Circle Workshop grew out of a desire to more adequately serve mathematically gifted students in our school district. One key to doing so would be providing teacher development, particularly in the area of mathematical problem solving. The initial aim of our Teachers' Circle will be to provide on-going training for teachers of gifted math students.

The gifted and talented middle-school students in Salt Lake are most highly concentrated in the Extended Learning (ELP) program at West High, and the initiating group of

teachers come from this school. We are partnering with the University of Utah, who will provide expertise for the Teachers' Circle.

I expect the most difficult aspect of the Teachers' Circle will be recruiting participants, as our public school teachers tend to be over-burdened by the educational system. Developing a critical and stable mass of active participants may depend on incentives, which may in turn depend on financial backing. Fund-raising will be one of my primary responsibilities for this Teachers' Circle.

A.16 McLaughlin, Hugh

Collaborative Problem Solving is an activity that will help the students (urban, lower income, and English Language Learners) in my district retain their knowledge longer and perform better on the state mandated tests. For the past three and a half years, I have participated in a program (Focus on Math) which pays teachers to meet in study groups twice a month and work problems. I would like this process to continue if the grant is not renewed. Math study circles seem a method of making this process self-staining within the district.

A.17 Nash, Marilyn

I am participating as a higher education instructor in the AIM workshop for Teacher Math Circle so that I am better prepared to share this teaching methodology with my preservice student teachers enrolled in my math method courses. I also hope to gain a deeper understanding of teacher math circles so that I am able to model the process in my higher education classrooms and with others in our local community.

A.18 Nix, Cheryl

My name is Cheryl Nix and I have been a teacher in the South Bend School Corporation for thirty one years. Although my major undergraduate degree was in math education, my first seventeen years of teaching experience were in various special education programs utilizing my minor degree of deaf education and Masters degree in learning disabilities. During my entire career - even prior to moving back into the general education mathematics classroom, I have been fascinated by how students learn math and why students sometimes struggle with what appear to be basic ideas (fractions come to mind). One of my great concerns is that with the push for standardized performance, an over-emphasis on rote skills is replacing rich, connected mathematics programs that offer long-term solutions for student learning. I also realize that my own attitude about aspects of the curriculum greatly affect my ability to develop the most effective programs for my students. The concept of a teacher circle seems to offer an opportunity for sharing of ideas and experiences and most importantly, for teacher learning. I am always open to new opportunities and strategies and feel that exploring problem solving strategies myself will help me facilitate my students in this area. I cant think of anything more important for me to do as a math teacher.

A.19 Pillsbury, Michael

I would like to become a leader in the Charlotte Metropolitan area in developing a successful teacher's circle. I feel that we as math teachers take much of our time focusing on low performing students and trying to get them to pass our state end of grade tests. We often leave our higher performing students wanting for the challenge of higher level

mathematical thinking. I feel strongly having worked with mostly lower performing students that challenging them with some of the same methods higher level students would enjoy will benefit all. We have "dumbed" down math instruction to the point where it becomes boring and not applicable to students. Most young people in today's society enjoy technology and are very adept at its use. Having them solve meaningless problems with no obvious application does not challenge or interest them. I know that initially there will be resistance or cries of "this is too hard" will be heard however continued exposure will ultimately benefit them as well as the higher level students. As I have told my students no one will walk up to them and ask what -3 and 7 is but instead they may be faced with a negative balance in their account and by adding 7 this would make it a positive 4. They have to see this practically. Crunching numbers is a part of math but application is the bigger part, We should not measure our success by solving equations but by solving "problems." Getting teachers to realize this by being a part of a teacher's circle will expose them to this idea. It will also bring together math teachers in a setting where ideas and teaching techniques can be shared. We as math teachers shouldn't hoard the things we learn in the classroom. Many brains always trumps one.

A.20 Podleski, Ann

I got my PhD in mathematics at Washington University in St. Louis. I have been a mathematics professor at Harris-Stowe State University (HSSU) in St. Louis since 1989. HSSU is a historically black college in downtown St. Louis and started as the teachers college for St. Louis public schools. The university now has 12 degree programs, but Teacher Education is still one of the largest programs and many of the students in my mathematics classes are pre service teachers. The St. Louis public school district has recently lost their accreditation and there is a real need for professional development support for the teachers.

The role I plan to play in the Teachers Circles is to lead problem solving sessions and help recruit teachers. I think collaborating with middle school teachers who have the experience in the classroom with the students is extremely important.

A.21 Reiter, Harold

Biography: I am a 64-year-old newly promoted professor in a highly ambitious math dept with a PhD program at a university of roughly 21000 mostly urban, first or second generation, students. I teach beginning level courses except during the summer when I teach a two-week intensive Problem Solving in Discrete Mathematics course aimed at middle school teachers. My research interest is in combinatorial games.

Charlotte Teachers Circle: The Charlotte Teachers Circle will draw mostly from the Charlotte Mecklenburg School (CMS) system, 127,000 students in 150 schools. In addition, there are three very strong independent schools, a dozen or so parochial schools, and a few popular urban school systems in counties adjacent to Mecklenburg County.

Together with my new math-education colleague Jeong-Lim Chae, I will select the mathematical content and lead most problem-solving sessions. I hope that my teammates Ormond Cottle (CMS middle school math specialist) and David Royster (head of the UNCC Math-Science Education Center (MSEC)) will help in recruiting teachers.

The venue is fairly clear. Providence Day School, one of the three independent schools mentioned above, has hosted both the Charlotte Math Club (math circle for grades 7-12)

and the Mecklenburg Math Club (for grades 4 to 6) for many years. Meeting at the same time and place as these clubs has great advantages.

Fund-raising is our biggest challenge. I have not figured out how to do this. I am planning to write some grant proposals.

The easiest aspect for our group will be running the sessions, provided that I can find some funds to make presenting more than a volunteer effort. I have half a dozen or so colleagues both from UNCC and from Davidson College who are interested in helping, some (the Russians) of whom have participated in math circles as students. I have no trouble finding good problems to work on.

A.22 Rishor, Donna

My undergraduate degree is in Business Administration from the University of Arizona. I worked for several years in the finance industry before finally deciding that I wanted to work as an educator helping students to see how their classroom mathematics learning connects to the real world. I earned a masters degree in Curriculum and Instruction from Chapman University in 1998 and have been teaching middle school math ever since. Ive taken teams of students to the state championship level of the Arizona Stock Market Simulation and have worked with students to participate in Math Olympiads and Mathcounts competitions. Ive enjoyed implementing the Connected Math series as a supplement to our regular curriculum materials and enjoy the richness of the discussions that take place when students are engaged in higher order thinking and problem solving rather than rote textbook work.

Im not sure what my role will be in creating a Math Circle here in Tucson but I am very excited about the prospect and looking forward to new challenges.

A.23 Rosenfeld, Deborah

For the past 3 years I have been working at the Education Development Center (EDC). I first joined EDC as a curriculum writer for the NSF-funded Think Math elementary curriculum, which is being published by Harcourt School Publishers. I found that I really enjoyed thinking about how to communicate ideas to students while simultaneously keeping the subject matter engaging for teachers who are then able to convey their enthusiasm for the material to their students. My excitement for this project led me to Focus on Mathematics (FoM), where I continue to see knowledge and enthusiasm for mathematics growing in students and teachers.

FoM is an Math/Science Partnership involving EDC, Boston University, 5 local public school systems, and 3 other universities. Through the partnership, hundreds of teachers engage in professional development activities that always keep mathematics at the core. One such activity that has been immensely popular and successful is study groups of mathematicians and teachers that meet regularly in the schools. As our funding ends, we are looking for ways to sustain the mathematical community that we have seen develop. I am attending this workshop to gather logistical information regarding starting and sustaining a Teachers Circle.

Prior to coming to EDC, I was a 1st grade teaching intern at the Hong Kong International School, a 4th grade teaching assistant and 8th grade algebra teacher at a private school in the Boston area, and an undergraduate at Harvard where I studied psychology.

A.24 Sakashita, Phillip

Background information: West High School is a comprehensive urban high school serving a diverse socio-economic and ethnic community. West offers over 200 courses ranging from remedial courses to vocational and college-level academics, including the prestigious Advanced Placement and International Baccalaureate programs, designed for serious academic students. West High School has a large ESL population with about 41 different languages spoken at home. Over 50

I have 19 years of teaching experience. I have been awarded the State of Utah Office of the Governor Excellence Award, 2002,State of Utah Office of Asian Affairs and Asian-American Advisory Council Mentoring Award, 2001, University of Utah Outstanding School Teacher Award, 2000, the George Shell Award for Excellence in Secondary Mathematics Education, 1994, Morris Travel Award for Teaching Excellence (trip to Japan), 1994, and the Most Valuable Member Award, Highland High School, March 1989.

Since I am new to participating in a teacher's math circle. anything would be helpful. I teach both extremes at West. I have taught everything from basics math facts for Resource students to calculus and linear algebra for IB math HL, so I would be interested in a broad range of resources.

A.25 Savitt, David

I received my PhD at Harvard in 2001, held postdoctoral positions at McGill (2001-02 and 2003-05) and IHES (2002-03), and since 2005 I have been a faculty member at the University of Arizona. For a little more than ten years I have been involved with Canada/USA Mathcamp, a summer program for mathematically talented high school students, as an instructor and (for the past five years) as deputy director. I will be the faculty advisor/liaison for the Math Circle(s) that we will be initiaiting in Tucson.

A.26 Schmidt, Anne

I am a twenty two year veteran of teaching middle school mathematics in Lincoln, Nebraska. Through my tenure, I have seen many ebbs and flows in the goals for students in math class. With the recent emphasis on assessment due to No Child Left Behind, has shone a spotlight on current practices. Recently, I was made aware of research that showed proficiency in mathematics is crucial to the future success of students.

I recently received my Masters degree in Teaching Middle School Mathematics from the University of Nebraska-Lincoln. The degree was offered through the Math in the Middle program funded by the National Science Foundation. The program emphasized the use of problem solving to help students develop mathematical skills. Program participants found that collaboration and discussion of mathematics and teaching and learning had a positive impact on our individual classroom environment. The process of learning the mathematics together through a specific problem led to many different interpretations and insights from a variety of people.

I found that the best ideas came from the synergy of committed educators. My own classroom structure and group and small group practices were more beneficial to student success and provided a forum to further challenge students to dig deeper into the mathematics. My hope is that we can find ways to continue to encourage this collaborative practice in and around my school district by finding a structure that will allow for teachers to meet on a regular basis for discourse on teaching and learning mathematics.

A.27 Serenevy, Amanda

Here is some information about my background:

I recently completed my PhD in mathematics with a dissertation on the dynamics of networks of inhibitory neurons in the hippocampus. I have published research on iterated matrix maps and have additional research interests in geometric topology and mathematical origami. I have been active in math outreach for many years. As an undergraduate and graduate student, I designed fractal workshops, organized math fairs and activity days, and led trainings for youth leaders and teachers. During the 2002-2003 academic year, I and fellow graduate student Joyce Macabea obtained a grant to visit five universities with significant populations of minority students majoring in mathematics to tell the undergraduates there about research, graduate school, and careers in the sciences. I taught 8 classes in the Boston Math Circle founded by Bob and Ellen Kaplan and served as a mentor to a new Math Circle instructor. Last fall, my husband and I founded Riverbend Community Math Center in north-central Indiana. This non-profit organization promotes enthusiasm for mathematics among people of all ages and backgrounds through programs such as weekly family math activities, a math studio program at local Boys and Girls clubs, enrichment activities for students in GED classes, tutoring for adult students wishing to enter apprenticeship programs in the building trades, teacher workshops, a summer math academy, and Math Circle classes.

The other members of our team are in a better position to answer demographic questions about the local school districts. However, here are my impressions based on presentations I have heard. (I could be wrong about some of this – I do not have easy access to statistics about the school districts.)

There are three major public school districts in our area that may be involved with a Teacher Circle program: South Bend Community School Corporation, School City of Mishawaka, and Penn Harris-Madison School Corporation. Of the three, South Bend Community School Corporation is the largest. South Bend schools serve mostly urban students and over half of their students are below the poverty line. South Bend schools are racially and ethnically diverse and serve many students for whom English is a second language. School City of Mishawaka also serves many students who are below the poverty line. Most students come from families with much less than the national median income. Mishawaka schools are historically less racially and ethnically diverse than South Bend Schools. Penn Harris-Madison School Corporation serves a mixture of poorer rural students and affluent students. Penn Harris-Madison is also less racially and ethnically diverse than South Bend.

My Role in Forming Teacher Circles

I plan to lead the formation of our Teacher Circle. I will also be primarily responsible for the mathematical content, with input from several other members of our team. Other members of our team will assist with logistics, grants and fundraising, publicity, and assessment.

Of the aspects of the Teacher's Circle mentioned, I believe that selecting appropriate mathematical content, leading a problem-solving session, and finding a venue will be the easiest to achieve. The difficult aspects include recruiting teachers to attend, and fund-raising. An aspect of forming a Teacher's Circle that we need to consider carefully is determining an approach that will benefit both experienced and new teachers, both mathematically trained and generally trained teachers. Based on conversations with teachers in our district, I believe

that having a lesson study component would be useful in addition to problem-solving and content knowledge components.

Some good resources for math and pedagogical content include:

Kaplan, Robert and Ellen. Out of the Labyrinth: Setting Mathematics Free.

Polster, Burkard. The Shoelace Book: A Mathematical Guide to the Best (and Worst) Ways to Lace your Shoes.

Adams, Colin. The Knot Book: An Elementary Introduction to the Mathematical Theory of Knots.

Franco, Betsy. Unfolding Mathematics with Unit Origami.

Hull, Thomas. Project Origami: Activities for Exploring Mathematics.

Gallivan, Britney C. How to Fold Paper in Half Twelve Times: An "Impossible Challenge" Solved and Explained.

Abbott, Edwin A. Flatland: A Romance of Many Dimensions.

Sved, Marta. Journey into Geometries.

Weeks, Jeffrey. The Shape of Space: How to Visualize Surfaces and Three-Dimensional Manifolds.

Needham, Tristan. Visual Complex Analysis.

Mumford, David, Caroline Series, David Wright. Indra's Pearls: The Vision of Felix Klein.

McGuire, Michael. An Eye for Fractals: A Graphic and Photographic Essay.

Devaney, Robert L. A First Course in Chaotic Dynamical Systems: Theory and Experiment.

Perl, Teri. Math Equals: Biographies of Women Mathematicians and Related Activities.

Sobel, Dava and William J. H. Andrews. Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time.

Bucciarelli, Louis L. and Nancy Dworski. Sophie Germain: An Essay on the History of the Theory of Elasticiy.

Friedman, Elizebeth and William. The Shakespearean Ciphers Examined.

Jackson, Allyn. Careers that Count: Opportunities in the Mathematical Sciences.

Gerdes, Paulus. Geometry From Africa.

Kinsey, L. Christine and Teresa E. Moore. Symmetry, Shape, and Space: An Introduction to Mathematics Through Geometry.

Moscovich, Ivan. Mastermind Collection Series.

National Council of Teachers of Mathematics. The Navigation Series.

American Forest Foundation. Project Learning Tree: Environmental Education Activity Guide – Pre K - 8.

A.28 Swartman, Amy

I am a graduate of Harris-Stowe State University (1999) with a BA in Middle School Education and a minor in Mathematics. I received my teaching certificate in the Spring of 1999. I began teaching in the Fall of 1999 at Hancock Middle School of the Hancock Place School District. I am still teaching a Hancock and this is my 8th year. I am currently working towards earning my Masters in Education from Southwest Baptist University.

I have taught primarily 8th grade Pre-Algebra and General Mathematics until this year, in which I am teaching both 7th and 8th grade. Hancock Place School District is a very small district, located just south of St. Louis City. The majority of our students come from low to low-middle income families, often single-parent and, sadly, too many from very dysfunctional and "broken" homes. About 60-70% of our students qualify for free-and-reduced breakfast/lunch and most begin their elementary education 1-3 years behind their contemporaries of surrounding districts in both reading/writing and mathematics. The majority of our 8th grade students are in a General Mathematics class. About 20-25% take Pre-Algebra. We also have a few gifted students that are in an Algebra I class. Next year we are going to include a Remedial Math class as an elective for those students that need to catch up on their basic skills.

Over the last several years, I have attended many professional development workshops. I will be grading MAP test this summer; this will be my 3rd year to do so. I was a participant in the Missouri Mathematics Academy during the summers of 2002 2003. This was an extremely rewarding experience for me in that I was able to work with some of Missouri's finest educators and college professors as they shared lessons they had developed using the Japanese "lesson study" model.

I am looking forward to this opportunity to once again work with other educators to explore meaningful and effective teaching strategies. I am particularly interested in the Teacher's Circle focus on problem solving and how to help students to become better at this skill. I hope that my experiences as a teacher and Math Academy participant will allow me to make a valuable contribution to our Circle.

A.29 Thornton, Blake

I have been at Washington University since 2002. Before then I taught at St. Louis University, Westminster College in Salt Lake and the University of Utah (where I received my PhD in 2002).

I am very interested in helping with the mathematical education of our middle school children. I am hoping to gain the following from the workshop:

- Learn how to get the word out about a teacher's circle—what do we need to do to recuit teachers.

- Learn what topics and level are best when determining mathematical content for the circle.

- Better understand exactly what our middle school teachers need and want from such a circle.

A.30 Trapa, Peter

Brief Biography and Background Information: I finished my graduate work at MIT in 1998, held postdoctoral positions at Harvard and the Institute for Advance Study, and since 2001 have been on the faculty of the Department of Mathematics at the University of Utah. During my time at Utah, I have been involved in a number of high school outreach programs and, in particular, have directed the Utah Math Circle for the last five years. My role in a Salt Lake City Teacher's Circle would likely be as the Circle's liaison with the university's mathematics department.

A.31 Zucker, Joshua

I was one of the organizers of our Teacher's Circle workshop last summer and the continuing monthly meetings this school year. I will help organize this summer's workshop as well.

I am a teacher at Castilleja School, an all-girls grades 6-12 school in Palo Alto. I have been active in Bay Area math circles for about 10 years now, including several years of running my own small local circle.

I look forward to sharing my experience with math circles and teacher's circles as well as learning from all the workshop participants about the mathematical culture for middle school students and teachers in their home towns.