Summary

Eighteen of the 19 participants filled out the survey. Most comments were extremely positive, and the overall picture seems to be that teachers were challenged but also energized by the week and that they enjoyed the experience. Some highlights from each survey section are listed below.

Likert Scale Items: All 18 respondents either agreed or strongly agreed that the workshop gave them a greater appreciation for mathematical problem-solving, that they felt more confident about their ability to work on problems they had never seen before after having attended the workshop, that they would use some of the materials from the workshop in their classrooms, and that they would recommend Math Teachers’ Circle to a colleague. Nearly all (16.5 of 18) agreed or strongly agreed that the session leaders encouraged participation and questions, but the comments suggested that a couple of respondents felt more comfortable participating with some session leaders than others. Also, most (16 of 18) agreed or strongly agreed that they were more likely to implement a problem-solving approach in their classrooms after having attended the workshop.

Although the proportions were still high, two figures that came out somewhat less positively were the number of respondents who agreed or strongly agreed that they would attend the monthly meetings of the Math Teachers’ Circle (14 of 18) and the number who agreed or strongly agreed that they would be more likely to talk with a mathematician about math after the workshop (13 of 18).

Problem-Solving and Pedagogy: Sixteen of the 18 respondents said they would change how they taught in the upcoming year, most commonly by incorporating more problem solving and allowing students more time to think about or explore problems. About half of the respondents thought the balance was right between modeling and discussing approaches to teaching problem solving, with a few saying either that the discussions could have been more focused or that they found the modeling more valuable. One person also suggested that overall balance could be improved by spreading out the sessions that were highly hands-on.

About half of the respondents said that they hadn’t seen any unfamiliar approaches to problem solving during the week, but they tended to comment that they found the review and the articulation of various approaches to be valuable. The others mentioned looking at a simpler case, representing the same information in different ways, and visualization techniques in Algebra, among other approaches, as being unfamiliar. Twelve respondents said that they planned to try these and other specific approaches in their classrooms.

AMC 8: Only two of the respondents did better on Friday’s test than Monday’s, and some commented that Friday’s test was much harder.

General Comments: When asked for their thoughts on the workshop, participants tended to use words like “outstanding,” “enriching,” “valuable,” and “exciting.” Several commented that they enjoyed the variety of presenters and topics. There were also a few less positive comments. One participant felt that one or more of the session leaders had made insulting comments about a
particular (unnamed) group. A couple of people remarked that the days were extremely long and that it was difficult to return in the evenings. One respondent said that the workshop was different than he/she had expected in that it focused less on pedagogical issues; however, this participant still found the workshop useful. A couple more commented that some topics were well beyond the reach of their students, which seemed to be regarded as positive by some and negative by others. Another mentioned that he/she felt intimidated and uncomfortable at times because of the pace, but that the positive experiences outweighed the negative. In the “other comments” section, someone commented that the binders did not accommodate all the materials and suggested that this be improved in the future.

When asked to describe how the workshop compared with other professional development workshops, respondents said that this one was more focused on math, that the math was more challenging and was sometimes beyond what they would teach their students, that it focused less on specific teaching techniques, and that it was more content-rich.
**Likert Scale Items**

On each Likert scale item, participants selected a rating and occasionally offered comments about their rating. The ratings were coded as follows:

- No Rating (NR) = not included
- Strongly Disagree (SD) = 1
- Disagree (D) = 2
- Undecided (U) = 3
- Agree (A) = 4
- Strongly Agree (SA) = 5

The mean, standard deviation, and distribution of the ratings for each item are given below, along with any provided comments sorted by the associated rating.

**Attitudes about Problem-Solving and Math Teachers’ Circle**

This workshop gave me a greater appreciation for mathematical problem-solving.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.9 (0.3)</td>
<td>NR SD (1) D (2) U (3) A (4) SA (5)</td>
</tr>
</tbody>
</table>

This workshop made me feel more confident about my own math problem-solving abilities.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.9 (1.0)</td>
<td>NR SD (1) D (2) U (3) A (4) SA (5)</td>
</tr>
</tbody>
</table>

I did NOT learn new techniques or approaches to math problem-solving this week.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 (0.2)</td>
<td>NR SD (1) D (2) U (3) A (4) SA (5)</td>
</tr>
</tbody>
</table>

After attending this workshop, I feel more confident about my ability to understand and work on math problems I have never seen before.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 (0.4)</td>
<td>NR SD (1) D (2) U (3) A (4) SA (5)</td>
</tr>
</tbody>
</table>

I plan to attend the monthly meetings of the AIM Math Teachers’ Circle.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 (0.8)</td>
<td>NR SD (1) D (2) U (3) A (4) SA (5)</td>
</tr>
</tbody>
</table>
Comment:

NR: Whenever possible

I would recommend the Math Teachers’ Circle program to a colleague.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.8 (0.4)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Pedagogy and Practice of Session Leaders

I did NOT feel comfortable trying out new ideas with the presenters and my colleagues this week.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 (0.9)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Comment:

U: I seem to look at some problems in unique ways, which is sometimes not helpful to the group.

The math presenters at this workshop encouraged the teachers to participate and ask questions.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3 (1.0)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Comments:

U/A: Some more than others

A: Mostly--sometimes the presenters' response shot down further questions

Anticipated Future Pedagogy and Practice

This workshop gave me some new ideas about how to be creative in my math teaching and also get through the material I am supposed to cover.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 (0.6)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
Comment:

U/A: Agree on “creative,” undecided on “get through material”

After this week’s workshop, it is now more likely that I will implement a problem-solving approach to the material presented in my course.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4 (0.5)</td>
<td>NR 2  SD (1) 0  D (2) 0  U (3) 0  A (4) 10  SA (5) 6</td>
</tr>
</tbody>
</table>

After this week’s workshop, it is now more likely that I will introduce a problem in my class to which I don’t know the answer beforehand.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6 (1.2)</td>
<td>NR 0  SD (1) 2  D (2) 1  U (3) 3  A (4) 8  SA (5) 4</td>
</tr>
</tbody>
</table>

I plan to use some of the materials from this week in my classroom.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.7 (0.5)</td>
<td>NR 0  SD (1) 0  D (2) 0  U (3) 0  A (4) 6  SA (5) 12</td>
</tr>
</tbody>
</table>

I am more likely to talk with my teaching colleagues about math after this week.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3 (0.6)</td>
<td>NR 0  SD (1) 0  D (2) 0  U (3) 1  A (4) 10  SA (5) 7</td>
</tr>
</tbody>
</table>

I am more likely to talk with a professional mathematician about math after this week.

<table>
<thead>
<tr>
<th>Mean (StDev)</th>
<th>Distribution (# of participants with each response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 (0.8)</td>
<td>NR 0  SD (1) 0  D (2) 0  U (3) 5  A (4) 7  SA (5) 6</td>
</tr>
</tbody>
</table>

AMC 8 Scores

On average, participants scored 2.7 points lower on Friday than on Monday (standard deviation = 2.9). Only two did better on Friday’s test than Monday’s. Some remarked that Friday’s test was much harder than Monday’s.
**Problem-Solving and Pedagogy**

**Do you anticipate changing the way you teach middle school mathematics in the upcoming year? If so, in what ways?**

Sixteen of the 18 respondents said that they do plan to change how they teach in the upcoming school year. The other two responded that they may make some changes but were unsure or not specific.

Ways they plan to change their teaching:

- Incorporate more problem solving (8)
- Provide more time for students to think or explore (5)
- Already planned to incorporate more problem solving, but workshop provided inspiration and ideas (2)
- Examine own current methods of teaching (1)
- Give the AMC8 to students (1)
- Increase use of visualization in teaching Algebra (1)
- Place more emphasis on having students articulate/record their reasoning process (1)
- Spend more time working on own knowledge of mathematics (1)
- Use more creative lessons (1)
- Use more puzzles (1)
- Use some of materials from this week (1)

**Comments:**

We are already being taught to teach math by incorporating problem solving in the SJSU credential program. But what this week has done for me is help me to see how I can do this, using a wide variety of problems, to cover a variety of topics, all with a similar set of strategies to use for approaching problems.

*We've worked a lot in our middle school to incorporate more of this kind of problem solving, and I think this workshop has encouraged/excited me to work hard to include even more of this type of work in my classes.*

--I think, I will just have to update myself of math learn and research new techniques in solving problems and MORE MATH problems.
--learn new strategy/approach on how to teach math effectively

*Yes. Examine the “exercises” I give and the “problems.”*
--Have “challenge” problems available for students to attempt and explain
--AMC8 @ school”

Yes, applications in problem solving where students have the opportunity to discover and deduce based on the concepts they already know and applying to new problems.
I will be much more inclined to start topics with exploration--seeing how engaged I became in exploration made me appreciate it more from a student's perspective. The problem, of course, it that it takes more time.

Yes--I plan on incorporating more exploration using problems with a higher level of difficulty. I also plan on using lessons that may not be in the curriculum, but that connect to the curriculum.

More problem solving to put more depth into topics

I am more committed to incorporating problem solving into my classes.

Make valiant attempt to integrate problem solving

I plan on doing more problem solving this year also, letting my students know it is okay to ask questions and be confused. It is part of the learning process. I do this already, but will discuss this more than I currently do.

Yes! Include more problem-solving

I am committed to giving more opportunities for open ended problem solving. I also will have students do a better job of recording and explaining their thinking.

I will try hard to incorporate the ideas in daily problem solving and also to carve out time for my students to work on harder problems.

Definitely!
--Encourage students to be patient
--Give them more think time
--Allow a variety of ways to problem solve
--Break down a complex into parts, or start solving a complex problem by making it simpler

Use more graph or pictures to represent the algebra. Use the puzzles to help improve their critical thinking skills and problem solving ability.

Kind of. Starting a lesson with a situation that I'm not sure of the answer might come up with pretty interesting unexpected outcomes might generate different aspects of math.

We will be using less of CPU this year as we have adopted Hult. So... some of these problems may be good starting or culminating activities for our topics.
This week you saw session leaders model various approaches to teaching problem solving, and we also spent some time discussing these approaches. What did you think about the balance between observing different approaches to teaching problem solving versus discussing these approaches?

Fifteen of the 18 survey respondents answered this question. Eight of them said the balance was about right, one said the balance was fine but the discussions should have been more focused, four answered that the modeling was more helpful or that there was too much discussion, one more said he/she liked the modeling but didn’t state a preference, and one commented on the type of session he/she liked most (start with lecture and then go into problem solving, rather than diving into problem solving right at the beginning). One person commented that there was a good balance of visuals and manipulatives, and another suggested spreading out the sessions that involved more hands-on activities or manipulatives.

Comments:

I appreciated the discussion sessions as it allowed us to gain greater insight as to how we could use these sessions with our classes.

Observing--teaching vs. discussing?
--The discussion part is nice to be at first to help the observers settle in, guide their thinking and somehow (illegible) imagination.
--The hands-on is cool in such a way that the abstract ideas are connected with a physical representation of the topic.
--So doing it along with observing the approaches are great!

It makes it easier to analyze the effectiveness of the approaches.

I liked the reflection time. I found I was concentrating on the math that I had to think hard and hear what others said about the teaching.

It was profitable to discuss what we saw because it either confirmed what I saw or made me aware of something I missed. It also brought us all back to the focus of the week which was to connect what we saw and experienced with what we can do in the classroom.

Excellent!

I thought the balance was positive and that it was a good idea to have teachers debrief the sessions. However, if one of the session leaders consistently de-brief and kept a focused emphasis on the teaching problem solving, it could have been “richer.”

Overall, the number of minutes spent on each was good. The only suggestion would be to consider the order in which the sessions are scheduled to break up the manipulative/hands-on activities more. I found that approach the most helpful, but it seemed to be very concentrated on Wednesday. It would also be helpful not to have the hardest/least familiar materials in the last session of the day.
Good balance of visuals, hands on. Seeing how to present a particular concepts was valuable as it allowed me to compare my teaching to others.

Very good being able to work with others helped me a lot with the new approaches more time observing so I can better understand the would help.

Modeling gives us more insight on how to present this material to our students and anticipate the same kind of questions.

The sessions I found most engaging were those where we did some problem solving first—especially with others and/or hands-on—and then discussed the approaches we had taken (either at the end or with several moves between solving and discussion).

I found the post-session discussions to be far, far less valuable than if we had had that time to continue working.

It was extremely valuable to have the instructors model techniques and discuss techniques (e.g., go to simpler version, observer odd/even, represent differently). The student led debriefing was not particularly useful.

I think there was a good balance between the time spent in sessions and discussing how they went.

I also think session leaders gave good explanations about how they would approach/guide students and at other times, modeled this instead of discussing it.
During this week's workshop, did you observe any approaches to teaching problem solving that you were previously unfamiliar with? If so, which one(s)?

Seven participants responded that they hadn’t seen any unfamiliar approaches, and seven others reported that they had. Three did not respond, and one responded off topic. Among those who said they hadn’t seen any new approaches, five who mentioned it was good to review and reinforce approaches they had seen previously, and one said that he/she had been exposed to new problems but not new approaches.

Some of the specific new approaches cited by the other seven were:

Looking at a simpler case (4)
Representing the same information in multiple ways (2)
Visualization techniques in Algebra (2)
Building 3D models (1)
Looking at a broad range of problems using the same technique (1)
Looking at complete patterns (1)
Looking for invariance (1)
Using complements (1)
Wishful thinking (1)

Comments:

The intuitive part of discussion is kind of missing sometimes in my approach. Of course, time is always an issue due to a lot of standards to be covered before STAR testing.

*I can’t say that I saw anything totally unfamiliar, but seeing these approaches in a variety of situations was very helpful.*

I think that intuitively, I was aware of most of the approaches but listing them out and being constantly reminded of them helped reinforce the importance of each and every single approach. A good comprehensive list and yes, I'll never forget to make them into easier problems! :)

*I think they were ones I was familiar with, but it was great to have them reinforced over and over to help ingrain some good practices.*

Not sure I saw new approaches to teaching as much as new types of problems.

*I'm not sure I saw new approaches but I did think the approaches were all strong and varied.*

*(The last session was not as smoothly presented. I could have been pretty tired or...)*

*There was a good deal of scaffolding that was very positive and there were lots of questions/problems that differentiated and extended well.*

I liked the looking at the complement method. I sometimes and my students often forget about this.
A lot of the problem simplification (go to simpler version). Also represent differently--e.g., checkerboard vs. bean counting. The many opportunities for looking at a broad range of problems with an objective of setting up the problem solving steps were particularly useful.

--solve a smaller problem, i.e., with Twoland coins
--visualization techniques for adding series

Many
--turning down the knob
--find what you don't want and use it to find what you do (example: area of cubes not counting corners => find corners area and subtract)
--how to better represent math information
--break out of habits using same shapes or graphs every time

Starting small--really small!

--model drawing of $a^2$, $a^3$
--writing out complete patterns
--building 3D models

--Looking for invariance was new
--Also monovariant
--Wishful thinking
--Give things a name

Yes. Many!
What techniques for teaching problem solving that you saw this week, if any, do you plan to try out in your classroom?

Of the 15 respondents who answered this question, twelve said they planned to try out some techniques they observed during the workshop, two stated things they enjoyed about the week without saying whether they planned to use them in their classrooms, and one said he/she was not sure yet.

Some of the techniques and specific sessions or problem types mentioned were:

- Alternative ways to visualize or represent information (4)
- Looking at a simpler case (4)
- Zome tools (3)
- Being patient (2)
- Doing something (2)
- Exploration/discovery (2)
- Observing patterns (2)
- Organization (2)
- Strategy games or puzzles (2)
- Working backwards (2)
- Accessible entry points for group (1)
- Box Problems (1)
- Conway’s Rational Tangles (1)
- Four points problem (1)
- Generalization (1)
- Hints/questioning techniques (1)
- More hands-on activities (1)
- More problems involving number sense (1)
- Problem vs. exercise (1)
- Tatiana’s geometry session (1)
- Problem solving methods from Intro to Problem Solving (1)
- “Turn down the knob” (1)
- Visualization in Algebra (1)

Comments:

My preference--what worked best for me--was lecture (background, approaches, work on simpler problem) then letting us loose on a more complicated problem. I get too frustrated with the “sink or swim” approach.

I liked seeing that two different problems ended up being the same math problem, just presented differently.

I am not sure yet.

Definitely the geometric Zome tools with my geometry class as this class is a smaller class of very high achieving students. I also will use Alon's 4 points problem with the same class.
Tatiana's geometry session is a great lesson that I can use with my pre-Algebra class. All of the problem solving methods work well with my mathlete students!

Encouraging students to adjust the “knob,” try something, work backwards, and be patient!

I think articulating various strategies with examples (especially solving a simpler problem). I also will probably use strategy games and the Zome tools.

Discovery technique is interesting to try out in class, especially in counting, sequences, and other properties of numbers.

--Generally more student exploration
--more looking at simpler case
--Generally, more emphasis on observing patterns, number sense

--positive hints (rather than earlier versions of solutions)
--intriguing questions
--accessible entry points for group

--guide students toward smaller problems and generalization or considering alternative ways to visualize the problem

--work backwards
--use more graphs or pictures to connect math understanding
--puzzles to help build problem solving skills
--use more than one way to represent information

--Starting with smaller problems
--hands on outside of the seats

--Table drawing, writing out the patterns
--”problem” vs. exercise

Patience, organization, symmetry, work backwards, do something, generalization, make a picture, look for a pattern

--Visualization in Algebra
--Conway's Rational Tangles
--Box Problems
--Zome Tools Geometry
GENERAL COMMENTS

Tell us your thoughts about the workshop.

17 responses:

I, of course, got a lot from my week at the workshop. Some highlights:

1) Specifying specific problem solving strategies, these may have been strategies I would have used before, but spelling them out helped me be more consistent.

2) It was wonderful to experience a variety of problems and apply strategies.

3) I really got a lot out of working with different people--I think it is worth forcing this “change partners” on participants if they don't do so naturally. It helped me see approaches new to me, challenged me to explain my own thoughts in different ways, etc.

4) Please don't assume all participants denigrate the same things. Making insulting comments about certain groups should never be acceptable by educators teaching a variety of students. :)”

The workshop was very intense but I learned a lot about how I need to restructure my teaching of problem solving to include the list of tactics that we learned about on the first day. I also am reminded about how important it is for students to have time to discuss, use manipulatives, and also have time to try problems with on their own using the various methods of working with problem solving.

I did feel that the days the days were almost too long and welcomed the speakers who had manipulatives to help break up the day and make the day go by faster. I appreciate all the work put into making the workshop so meaningful and applicable to what we do in our jobs. Thank you!

I really enjoyed the richness and variety of the problems we discussed. I also liked that there were four different main instructors so we experience a range of teaching styles and methods. I was way too tired to return in the evenings. We do so much during the day that I needed the break.

Thank you so much for the time, effort, and care that you put into offering this workshop!

+Well worth the time
+Some sessions will be very hard to be able to “simplify” for middle school students
+Liked agenda up front, pretty much stayed on schedule
+2 hour lunch gave time to unwind, relax--and walk to restaurant
+All presenters highly approachable
+New ideas for activity/manipulatives
+Thanks for the Zome

-Some topics well beyond what we can use in class
-A few topics were well beyond my personal skill/interest
I expected that the workshop and sessions would be a bit more connected to the topics in the middle school math standards. I expected that we would learn more specific ways to use problem solving to teach more specific standards--for example, if students were learning about slope, here's a way to present it and explore the topic using problem solving. Since the range of topics in middle school math is fairly limited--Math 6, Pre-Algebra, Algebra, and Geometry--even a specific topic might be applicable for most teachers, and even if a particular teachers didn't teach that specific topic, the general approach would provide a model that could be adapted. Overall, the workshop and sessions, then, were not what I expected, but I do think what I learned will be useful more generally. The challenge will be for me to have the time to figure out how to best incorporate these ideas into my classes.

--Fun, motivating, enriching, and exciting.
--It made me realize the feeling of the students when I'm teaching new things that I have no clue at all!
--It made me review the math stuff I haven't used for n years now!
--The speakers are awesome! It made me feel the need to pursue higher education.

--Wonderful to be treated so well. Thanks to AIM and its staff and the leaders.
--Although the presentations were nearly universally excellent, four “serious” were a lot each day.

I enjoyed the opportunity to solve problems much more difficult than those I usually present in my classroom. The presentations were well done and I could see many ways to use the materials/problems in my classroom.

Was great I gained a lot more insight into solving problems (I don't mean exercises). I learned to look at things different, turn down the knob or work backwards.

Outstanding! I loved the variety of topics as well as the variety of teaching structures. It is also valuable to collaborate with the different teachers. This was an amazing (very positive group). Most of the topics were either new to me or used in a different way. This was a useful experience that will add to my best practices in the classroom as well as provide me with more tools for MathCounts.

--It was great and wonderful… I learned lots of new things.
--It has given me an opportunity to update my learnings in math.
--It gave me more inspiration to develop my mathematical skills, and strategies in solving problems.
--It opened my mind to lots of discoveries and more discoveries to be done...
--It gave me an opportunity to improve my teaching strategies in math.
--It made me grow more in math and in my teaching profession...
--Wonderful, excellent superb... Thank you so much!

--Very valuable information
--I enjoyed the variety of topics
--Would love to attend a teacher circle geared towards Elementary (K-5) math
1) Lots of fun
2) Not quite enough time to work on all the problems, wished more time to explore
3) appreciate being able to work on these with other MS teachers
4) I think I was too tired on Friday a.m. to really get into the 2nd presenter's topic. Would rather have explored the Zomes in further depth.

I thought it was an intense and a valuable learning experience. There were times I was frustrated at the pacing because we rushed through the math too quickly for me to understand and the presenter was moving on to a new problem or thought before I could process what I had just heard. I sometimes felt comfortable slowing down the talk to ask questions to clarify my thinking and other times I didn't (because I felt there would be too many questions on my part). Even though I know, intellectually, that most likely if I had a question others would too, I still didn't feel comfortable. I think sometimes too much was assumed on the part of the speaker (of our prior knowledge) and that made me feel intimidated. However, I had lots of wonderful experiences that made me grow mathematically and as a problem solver. They outweighed the negative, or frustrating, experiences.

It was fabulous to be immersed in math for a week without distractions of home and family. I really enjoyed meeting and discussing math with fellow teachers and math experts. I learned a lot about how students must feel when they are trying to learn something that is challenging. Concrete examples really help the abstract make more sense. I also learned to give students time to process through a concept before adding to it. All of the mathematicians showed a passion for the subject and seemed to be genuinely delighted to have us here.

The timing of the workshop is excellent. It's in the summer, when school it out! No schoolwork got in the way (i.e. meetings, grading, etc.). The stay-in accommodations provided extra time to finish work with colleagues and with supervision by the workshop mentors. Being immersed in math content at a deeper (or higher?) level is a welcome change from the daily grind of middle school math. It's like stepping back in time and being just a student (undergrad/grad) and enjoying math in a fun and satisfying way.

It was a very inspiring workshop for many different reasons. The modeling of teaching techniques and strategies showed me from a student's perspective, what I might try to do more of, such as, presenting visual as well as manipulation/calculation aspects of a topic/problem. In addition, I came to appreciate the need to allow for a generous amount of time for students to think about a problem both individually and in a group, that the time spent doing so is well worth it.

The experience of being in a “class” and learning and discovering from math professionals provided me with the opportunity to think about the “whys” of what I teach students and how it could be beneficial for me to do this more often with them.

Most importantly, I am grateful for the opportunity to practice and learn about problem-solving methods, so I feel I can do a better job of incorporating problem-solving in my classroom. The workshop provided excitement about math in me and promoted the desire to provide such opportunities for my students. Thank you!
Please comment on any differences or similarities that strike you about this workshop compared with other professional development workshops you have attended in the past (if applicable).

Fourteen of the 18 respondents answered this question. One had not attended any professional development workshops previously, and two commented on positive aspects of this workshop without saying how it compared with other workshops. Some of the specific differences noted were:

Less focused on specific teaching techniques (3)  
More challenging math that was beyond reach of students (3)  
More content-rich (2)  
More focused on math/doing math (2)  
All middle school teachers (1)  
Greater variety of presenters (1)  
Greater variety of topics (1)  
Less focused on classroom management or discipline (1)  
Less student-oriented (1)  
More focused on teacher content knowledge (1)  
More comprehensive (1)  
More intense (1)  
Overnight accommodations (1)  
Small class size (1)  
Social dimension (1)  
Teachers more focused (1)

Comments:

I have never attended a workshop like this, but hope to participate in the Math Circle in the coming year.

It went so fast, that the time seemed to fly by because all the topics were so engaging. There was no pressure and there was a good comfort level.

This one was unique from others I have taken because of the diversity it topics during the workshop as well as the variety of presenters.

A lot of workshops that I attended are more of strategies that dealt with classroom discipline or management. It's more on student-oriented approaches. But this one is unique because you hit the knowledge level of the teachers than the students. You enriched our ability to teach and made us confident to deliver math in class in various ways. And with that I THANK YOU! I'm looking forward to working with you more in the future.

I appreciated the time allotted to hands on problem solving.

More challenging mathematically than most--by far!
Some of the math I attempted this week was uncomfortably deep. Most workshops only talk about math I am currently teaching.

*This was much more challenging, mathematically, than any other workshop I have attended. I loved the fact that we were all middle school teachers and thus the math level was so much more challenging. Other long-term classes I attended were mixed with Elementary teachers, so the math tended to be easier.*

During the workshop, I felt like a student taking a math class, and I was challenged to solve many interesting problems. Other workshops I’ve attended have been less content-rich with more time spent on discussing problems rather than doing them.

**Similarities:**

--fun  
--enriching  
--use of good teaching practice  
--highly motivated, professional presenters

**Differences:**

--Deeper in content/higher level math  
--Stay-in/accommmodation  
--Small class size (which allows for more interaction)  
--Banquet/picnic provided a social dimension to the rigour of doing math daily, hence fosters good camaraderie

Many of the other workshops I've attended have been more concretely applicable (not necessarily a specific topic, but a more concrete method) and less focused on the math itself. This workshop included more of the math behind the techniques--math that would be beyond the reach of my students.

*By far, this workshop is the most intense and comprehensive workshop. I did enjoy the debriefing as it allowed us the time to begin to digest the material and think about where and when I could use these techniques in my own teaching.*

New teacher I have only been to a few workshops.  
--but from those this was years more helpful  
--I see connections and paths to try and explore to real teaching situations (from u)  
Not some theoretical information that is hard to know how to use (I learned from other classes)

--*Teachers were very focused. Other workshops I have been to, teachers sometimes lose interest and get distracted.*  
--I liked how breaks were given throughout and how different teachers were given the opportunity to lead discussions.*
Any other comments?

10 responses:

It was a wonderful experience to learn from such a great variety of presenters. Not every one might be the “perfect” one for my learning style, but I learned something about good math teaching from everyone. I really look forward to joining the math circle.

This is AWESOME! Keep it up!!!

The instructors did an incredible job. It was impressive how they were able to judge how to balance our personal exploration of subjects with when to pull us together and add insights or redirect us.

Try to organize binder to accommodate all the materials we received.

Great workshop I am very glad I came.

I cannot believe the week went by so fast! This was great.

Thank you so much!! We will always support MATH and AIM

Gives me a better understanding of the importance of patience. I was challenged this week in a positive way… I appreciate the patience that was given to me when I did not understand or when I was stuck.

Thanks for this great opportunity! You are all awesome.

WOW! We were treated as special guests. Thank you for providing a beautiful place to stay, yummy snacks, time to think, and compensation for meals. I feel blessed.