

**Please select the workshop(s) that George and Elisabeth lead in your classroom.**

Chopsticks Hyperboloid

Chopsticks Hyperboloid, 12-Card Star

12-Card Star

Chopsticks Hyperboloid, Giant SOMA Puzzle

Paper Puzzles

Paper Puzzles, Chopsticks Hyperboloid

12-Card Star

Giant SOMA Puzzle

Zometool Workshop

Giant SOMA Puzzle

Paper Puzzles

**How did you enjoy the workshops?**

omg! it was awesome. my students loved it, other teachers (from various departments) were jealous, there was genuine student engagement and excitement. it was great.

The workshops were great! The students enjoyed the creative process and I enjoyed their creations.

Very much so! Relatively easy to plan the logistics and the students certainly enjoyed themselves, especially since there was a product they could take home.

The workshops were completely enjoyable.

Tremendously! I felt very inspired to continue introducing my students to the creative nature of mathematics.

I loved them! They were a lot of fun and the kids absolutely loved them too! Many of my students stayed up at lunch the following week to make more paper puzzles.

It was fantastic and the students really enjoyed it too!

The workshop was a wonderful experience for my students. They loved the hands-on experience, were truly engaged in the activity and have enjoyed having a set of the blocks to experiment with on their own. It's a great reward for finishing their work.

The workshop was highly engaging, enjoyed by 2nd grade students and staff members alike. While challenging, students were able to construct many of the 3-D shapes individually or in partnerships. The experience was unlike any other we have participated in as a class.

I thoroughly enjoyed the workshop. It was engaging, accessible and challenging for all of my fifth graders. A highlight of my teaching year.

My kids REALLY enjoyed the workshop! Some struggled and wanted to give up (interestingly enough, many of those struggling are my "top" kids), while others THRIVED and wanted to do more.

### **Were the workshops useful in your class?**

yes. material was not central to any topic I teach, but served to generally improve interest in math-topics.

The workshops were a nice way to see a creative sculpture that could be done with math. Also, having two mathematicians/artists be present as role models for people who do math was great for the students. I did not make direct connections to the curriculum, but the students enjoyed the sculptures.

The content of the workshop wasn't directly useful, but the main ideas that George and Elisabeth championed, that mathematical structure can be found in unexpected places and that math is really about playing and exploring, were of enormous help in framing mathematical success to the students as the year progressed.

Yes, the hyperboloid that they made was relate able to the functions we worked on this year.

Very much so. Students talk about George till this day and often ask me "Are we doing any paper puzzles today?" - talk about leaving a mark!

Yes. I don't think they had a direct curricular connection but the enthusiasm they generated was more than worth it.

Yes, as I started a Math Modeling & Art class and the students have enjoyed the projects and meeting other math professors in the field.

Yes, absolutely. My principal has asked that my class paint or papier mache the large set we made so that they can be used by other classes in the school.

Yes! While we aren't currently studying geometry, the workshop served as a spiral review of geometric concepts covered early in the year, and introduced new ideas and extended understandings. In addition, the workshop served as a great example of the power of perserverance and teamwork. Students couldn't believe what they had constructed!

Yes, it provided the students with a hands on experience to explore three dimensional geometry. There are so many activities that we can do using the SOMA blocks, and the kids are very eager to continue with them.

Yes! I teach Geometry, and this workshop was perfect for it - it wasn't perfectly timed for the unit I was doing then, but still super fun and engaging, and another way my kids saw how Geometry is more than just two column proofs :)

### **Would you like more activities like this in the future?**

yes. yes. yes.

Yes!

Yes - getting a real working mathematician into public schools is a fantastic idea, as is getting the students to explore math not tied to the Regents or any other exam or curriculum, but seeing connections nonetheless.

Yes!!

Absolutely, in a heartbeat!

Yes!

Definitely!

Absolutely! It was a huge treat for my students and for me.

Absolutely!

Yes, definitely.

Yes please!

**Do you see yourself incorporating more hands-on activities in your class as a result of the visits?**

yes. it's hard to come up with meaningful hands-on activities on my own. but having a resource like Dr. Hart's website, is great.

Yes!

I have already (and envision more in the future) incorporating activities inspired by George and Elisabeth in our school's Math Club.

I incorporate many hands on projects in my class already.

Yes; this workshop motivated me to try to make as hands-on activities as I could find that were related to the content I was teaching.

Yes--I just received a Donorschoose grant for materials for a number of the other activities on the website. We are going to do more after the state tests (while I would love to do more sooner, I don't think it's feasible for me to use class time to do much sooner than this, but some sort of afterschool club is another idea I've been considering).

Yes, and I plan on doing more with it in the greater school community as well.

Yes, definitely.

Yes, the workshop was a powerful example to teachers of the need for highly engaging, challenging and hands-on activities. Every single student was engaged.

Yes, it was an important reminder of how hands-on activities can make learning come alive. George and Elisabeth had their attention for 2-3 hours, and the kids were doing such amazing thinking, talking, sharing and exploring. All students were engaged, which is a challenge in our ICT class with such a wide variety of student abilities.

Yes, I was very inspired by the mini-course he taught at MfA, as well as a workshop he led a few years ago. I love showing my kids the "fun" part of Geometry (and math in general) and his workshops have really helped me realize how important that aspect is.

**How useful is the website [makingmathvisible.com](http://makingmathvisible.com) in your teaching and in helping you conduct hands-on activities on your own?**

see above. it's very helpful.

I would use the activities in math club, but not necessarily in class regularly.

I am thankful for the lesson plans for those specific activities, but do not find the website particularly helpful for conducting other hands-on activities.

I like the step by step procedures that are laid out and are easy to follow.

Honestly, I haven't been checking this website but I'm glad to see the pictures of my students!

It took me a little while to figure out the navigation at first but it seems to have great activities.

Amazing. And I find it particularly easier for a teacher to navigate than George's main website.

I haven't had a chance to spend a lot of time on the website, but George and Elisabeth left behind a worksheet with some extension activities and we have been using those.

I haven't used this website before, but I will visit it immediately.

I haven't used it yet to conduct a hands on activity. It definitely helped to have them come in and launch it!

I haven't used the website specifically, as four of the workshops were already done in the mini-course at MfA

**Do you have any suggestions for George and Elisabeth when they lead future workshops?**

no suggestions. Dr. Hart has very good presence. Elisabeth is also very good.

Nothing that is especially specific or constructive.

Depending on the length of time available and the maturity of the students, it can be really powerful to have the students reflect/journal on the main ideas of the activity - even if to get them thinking that math can be found in places other than equations, even if they perhaps don't intricately understand the idea of an isomorphism to a cube (for example).

It was a great experience, just keep doing what you are doing.

None really... I think everything is was planned really well.

I think they did a great job overall, occasionally the directions were hard for kids to understand. I'm not sure if it would have made sense to have some sort of visual aids or printed/projected directions but it might have helped some kids and/or the teacher helpers in the room.

Nope. They're perfect! :)

I can't think of any, their presentation was perfectly suited to my students' interests, skills and attention spans.

I appreciated that they allowed students to choose their own design and build whatever they wanted, however I would like them to encourage more of a challenge. Many students who chose just to build simpler cubes on top of cubes to reach a great height later expressed that they wished they had taken on one of the geometric challenges. Also, it was difficult to make sure young children were stopping their building to listen to George and Elisabeth's ideas, suggestions, or explanations. Perhaps building in a few simple routines for hands-off the materials, eyes on the speaker would be helpful.

No, I was impressed by their classroom management techniques, the clarity of the instructions, and the pacing and sequencing of the workshop.

Every school's population and culture may be different, so I think it may be useful to go over the structure of a specific class with them, before they lead the workshop, so that ALL kids are engaged throughout the class. My kids were great, but several definitely got sidetracked and distracted along the way.

**MfA is always looking for different ways to support the work you do in your classroom. Was it helpful to have mathematicians lead workshops in your classrooms in addition to leading workshops at MfA?**

yes.

Yes!

YES. For all the reasons above.

Yes! It was so much fun to see the students engaged in a hands on activity. It was fun to see the students make

what I had also made in my workshop.

Absolutely! It gave me more credibility. I've been talking to my students about the true nature of math but they didn't really believe me. Having mathematicians come to our classes and talk to students sheds a new light on what math really is all about and how we can all appreciate it.

Yes, it was really a treat for me and for the kids. The workshop really made me want to do more things like this with my classes and probably isn't something I would have done on my own otherwise.

Absolutely!

This experience was one of the highlights of my school year so far. I do a lot of coteaching with another teacher at my school who teaches a class for students with Autism Spectrum Disorder. We were able to combine our two classes for this activity, and it was fascinating to be able to watch our students engage in a challenging, hands-on activity together. Afterward we had a discussion about the word perseverance, and we called attention to the way students felt challenged to assemble the blocks into a cube at first, but kept trying, often helping one another, and were eventually able to succeed. It was an important lesson for my students, who often struggle to meet academic standards and expectations. Between the opportunity to combine classes and bring together students with different abilities, engage the students in challenging problem solving through a hands-on, visual/spatial modality, and then have the large blocks for others in the school to try, this opportunity was great for my students, my colleague and his students, for me and for our entire school.

It was a rare privilege to have math-related experts lead a workshop in the classroom. This is a first for me in my 12 years of teaching. It was helpful, exciting, and inspiring. I hope to see more opportunities like this one in the future!

Yes, we would welcome more mathematicians into our classroom. I thought it was important for kids to meet an adult who "does math" professionally. I don't think they knew it was possible.

YES! :) I loved being able to participate in the workshop BEFORE my kids did, so I could experience it myself, and think about how my student might react to the same activity.

### **Do you have any additional comments?**

We as a school really appreciated the opportunity that MfA provided by having George and Elisabeth come to visit.

It was engaging, fun, and exciting. George and Elisabeth really went out of their way not only to get to Staten Island on a snowy day, but to explain the procedures to the students and give them feedback as they were working through it. The students had a great time! Thank you for making this happen.

Loved working with George and Elisabeth. They're a great team. :)

Thank you for the opportunity!!!