

Milton Academy Math Teachers Conference Schedule 2015

| | Hour-long sessions | Mini session times | Ware 408 | Ware 401 | Ware 403 |
|---------------------------|---|--------------------|---|---|--|
| Block I: 9:45-10:45 am | Ware 406 Follow-up conversation with the keynote speaker, Dr. Pooja Agarwal. Join in anytime over the course of the hour to ask questions and learn more about the research around retrieval and quizzing. | 9:45-10 | Statistics <u>What does “fair” mean:</u> Was having three black jurors on the Ferguson trial fair? We will consider this question from a statistician’s point of view. Sharon Hessney, MassInsight Education | Algebra and Geometry We will look at two different activities, one for Algebra, where each student identifies a function and demonstrates its behavior in an Excel spreadsheet. For Geometry: “Is the AT-AT falling over in <u>Empire Strikes Back</u> realistic?” Examine footage of the large armored vehicle toppling, and discuss whether the timing matches what we might expect. Stephen George, Belmont Hill | Technology in math Differentiated uses of <u>technology in a calculus course</u> : we will look at ways to bridge the gap between derivatives and Newton’s method, and between integration and Riemann sums using computer programming skills. Peter Kahn, Milton Academy |
| | | 10:05-10:20 | <u>A Little Geometric Probability Every Year:</u> Go beyond the idea of probability involving area to develop functions associated with geometric objects derived from random points. We'll look at how one question can be reconsidered over the course of four years. “If two points, X and Y, are chosen at random along perpendicular sides of the unit square, what is the expected value of the area of the rectangle whose sides are of length X and Y?” Martha Jacobsen, Milton Academy | Come see one way to investigate <u>conic sections</u> , using Geometer’s Sketchpad. The ideas shared can easily be translated into other Geometry software. Hal Pratt, Milton Academy | <u>Creating graphs and images for math class:</u> Come hear about a few different programs I like to use when creating a graph or an image to use on a handout or an assessment. Bring any ideas to share with others as well! We will look at Desmos, Graph, LaTeX and Word, at a minimum. Heather Sugrue, Milton Academy |
| | | 10:25-10:40 | We will consider the “ <u>one-boy policy</u> ” activity, where students simulate an alternative to China’s one-child policy and calculate the expected family size and expected gender ratio under the alternative policy. Stephen George, Belmont Hill | <u>Discover, Prove, Publish!</u> Giving Students a Taste of Mathematical Research. Come learn about a framework for letting students make their own Geometry discoveries, prove them, and then present their results both in a published journal and aloud to invited guests. Matt Simonson, Milton Academy | Explore the use of <u>auto-graded assignments</u> in mathematics, examining both free options such as MyOpenMath and commercial offerings such as StudyForge. The focus of the presentation will be the pedagogy and practice of using auto-graded assignments. Brian Lester, St. Mark’s School |
| Block II: 11 am – 12 | Ware 402 Learn some programming basics (in Java) and how Milton Academy has been incorporating Java into Geometry courses this year. We will share what we are doing, and also let you experience being a student, learning Java. We will provide computers for you to use. | 11-11:15 | Precalculus and Beyond <u>Open-ended projects:</u> We will look at some student work (from Precalculus) and discuss the merits and risks of open-ended projects in a math class. How can we learn more about our students and ourselves by engaging in more innovative thinking, together? What types of final products make sense? Heather Sugrue, Milton Academy | Technology in math What are the pros and cons of <u>flipping your classrooms</u> ? I will share how I flip my classroom with my 9 th and 10 th grade students, and why I make this choice. Victoria Miles, Middleborough High School | Outside the Norm – Bringing Creativity into the Classroom <u>Estimation 180</u> – You may have seen or used estimation180.com in your math class before. Come see how an Algebra I class created their own version of this site, and continue to value estimation skills. Anne Kaufman, Milton Academy |

| | | | | | |
|----------------------------------|--|-------------|--|---|--|
| | <p><i>This session will run for the full hour. This session will be repeated during Block 3.</i></p> <p>Chris Hales, Milton Academy</p> | 11:20-11:35 | <p><u>All About That Base: making logs No Trouble</u>. A success story of logarithm use in the Precalculus classroom. How early and frequent emphasis of the inverse nature of these generally unpopular functions was almost <i>too</i> helpful.</p> <p>emily bargar, Milton Academy</p> | <p><u>Mathalicious</u> – What are the benefits of paying \$185/year to join this website and gaining access to their lesson plans and projects, aligned to the Common Core? We will share how we have used some of their lessons, and give you a glimpse into the power of this amazing site.</p> <p>Susan Karp, Milton Academy</p> | <p><u>2024 Olympics Project</u> – Come to learn about the logistics of conducting a large group, multi-class project (180 juniors in Precalculus) on why Boston should get picked (as we just did!) by the USOC to be a site for the upcoming Olympics. The project culminated in a public symposium where each group shared their work with attendees.</p> <p>Becky McCormick and Anne Kaufman, Milton Academy</p> |
| | | 11:40-11:55 | <p>We will consider the <u>logistic function</u> (whose graph is a S-shaped curve with relatively slow start, then very rapid growth followed by leveling off). We will look at some real-world examples including population growth, and sales of a commodity (e.g. Apple's iPod).</p> <p>Upasana Kashyap, Regis College</p> | <p>Come check out <u>Polynomiography</u> (polynomiography.com), software developed at the DIMACS at Rutgers which shows iterative solutions to polynomial using Newton's Method in the complex plane developed as part of an NSF project. It can be used to illustrate the Fundamental Theorem of Algebra and to create beautiful images.</p> <p>Jonathan Choate, Groton</p> | <p>We will share some <u>teaching strategies</u> to bring games into the classroom. How can a shift from the day-to-day help invigorate the students in the room, and help everyone re-engage? Bring your own ideas to share as well!</p> <p>James Williams, Milton Academy</p> |
| <p>Block 3: 1:15-2:15 pm</p> | <p>Ware 402</p> <p>Learn some programming basics (in Java) and how Milton Academy has been incorporating Java into Geometry courses this year. We will share what we are doing, and also let you experience being a student, learning Java. We will provide computers for you to use. <i>This session will run for the full hour, and is identical to the session running in Block 2.</i></p> <p>Chris Hales, Milton Academy</p> | 1:15-1:30 | <p>Algebra II and beyond</p> <p>An open discussion question about "<u>Shoes and Socks</u>": Could teaching sequences of inverse operations as a way to solve equations allow students to develop a better understanding of functions and order of operations? Gregg Reilly, Milton Academy</p> | <p>Beyond the classroom</p> <p>Why should teachers participate in the <u>PROMYS for Teachers</u> program (http://www.promys.org/pft)? Come learn about the program from a graduate and see if it might be right for you.</p> <p>Beth Blumberg, Western Mass ARML Math Team</p> | <p>Potpourri</p> <p><u>History of Math</u>: Why should we teach/learn the history of mathematics in our school?</p> <p>Brian Lester, St. Mark's School</p> |
| | | 1:35-1:50 | <p>"<u>Careful Counting Calms Cake Chaos</u>" and is a story about a birthday party for my 12 year old niece and her attempts to keep everyone happy through clever cake-cutting. Complications ensue, with math to the rescue.</p> <p>Keith Hilles-Pilant, Executive Director, Math for America</p> | <p><u>Math, Politics and Society</u>: Come get a glimpse into how high school students can use math to analyze elections, Middle East peace agreements, racial injustices, and the fate of the world.</p> <p>Matt Simonson, Milton Academy</p> | <p><u>A conversation about proof in high school math</u>: What role does proof play? Should we be doing more or less of it? How does it help form the mathematical mindset? How does it challenge kids in less useful ways? Come ready to talk together about why we do what we do, and what might be.</p> <p>Heather Sugrue, Milton Academy</p> |
| | | 1:55-2:10 | <p>Straight talk about 'non-linear' regression! How we can solidify student understanding of exponents and logarithms by straightening curvilinear relationships in data? Using technology to get at a common issue in modeling the world.</p> <p>Gregg Reilly, Milton Academy</p> | <p>Learn how to run a <u>math team</u>, including the logistics of tournament competition, where to find resources, and how to start a team.</p> <p>Beth Blumberg, Western Mass ARML Math Team</p> | <p><u>Fractals, coding and creative connections</u>; an example of an 'odd day' before break in the context of an AP Calculus course. A doodle of a fractal tree leads to a page on code.org, to a conversation about recursion, to an investigation of number patterns, to a college application. I'll describe my example then we can share other 'one-off' investigations for those days when the schedule throws us a curveball - bring your ideas!</p> <p>Peter Kahn, Milton Academy</p> |