

# CASE STUDY



The University of Texas at Austin  
Charles A. Dana Center

## The Urban Mathematics Leadership Network & The School District of Philadelphia: A collaboration for strengthening mathematics education

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### Introduction

It's a sunny June day in Philadelphia in 2017, and close to a thousand mathematics teachers and their principals are in Abraham Lincoln High School eating lunch. Tables that seat ten apiece have been set up in the cafeteria, and gathered at the round tables are teachers and principals, enjoying box lunches.

Conversation is boisterous, as many groups are meeting with others from their schools for the first time that day. A group of more adventurous teachers has taken their lunches outside to enjoy the sunshine, lounging on the grass or sitting on chairs in the shade.

Today marks the start of the second of three annual weeklong MathCounts summer professional development institutes<sup>1</sup> for mathematics teachers—of grades K–8 and of Algebra I—in the School District of Philadelphia.

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Earlier that morning, the day's activities started with a small group of students with stringed instruments playing Journey's *Don't Stop Believin'* and other pop music while district mathematics faculty members streamed into the school's auditorium. After the morning's first speaker described how mathematics could be used by students to understand and work against injustice, the mathematics content team takes the stage.

The district's director of mathematics begins his talk by thanking the teachers for their work in completing another school year, noting that their "care for students is obvious."

He goes on to share the district's vision statement for mathematics:

**"All students think mathematically, and they will be empowered to own, share, and do mathematics."**<sup>2</sup>



The director continues, noting that all students are mathematical thinkers and that “In our work together, we want to empower students to recognize and own their mathematical ideas, to share their thinking, and do mathematics—to engage in problem-solving, to make sense of mathematical ideas—on a daily basis.” He adds, “We need our students to think mathematically. We need them to help us build a society that is more critically engaged, better able to reason critically.”

The Philadelphia mathematics director then ends by sharing the structure that teachers can expect for the days to come. Each day of this week will begin with a guest speaker who is tasked with “addressing the daily themes, their research and experience with math education, and what they believe is needed to move math forward.”

Afterward, grade-level groups engage in interactive workshops on aspects of the Standards for Mathematical Practice of the PA Core standards,<sup>3</sup> concluding with time for each school group to meet as a team.

The workshops also incorporate discussions of instructional best practices, strategies to engage students in exciting problem-based mathematics, time to experiment with tools around lesson planning, and thoughtful review sessions around the curriculum and standards. The activities for each day are aligned with one of five guiding principles that the mathematics content team developed for professional learning.

The Philadelphia district mathematics team then shares the guiding principles<sup>4</sup> that they and Carnegie Learning have used to structure this weeklong training. The five principles are:

**Purpose-Driven Work**—teachers should have a purpose and a goal that they are driving for with everything that they do in a classroom.

**Rich and Meaningful Tasks**—teachers should regularly provide tasks that have a high cognitive demand.

**Equitable Discourse**—teachers should consider the ratio of student to teacher talk as well as which students are talking in class.

**Questioning and Curiosity**—teachers should value questioning more than answer-getting, and they should strive to foster genuine curiosity.

**Valuing Diverse Thinking**—teachers should value ideas and strategies more than correct and incorrect answers, and teachers and students can learn from one another.

Five months before this professional development, members of the Philadelphia mathematics content team spent time at the Urban Mathematics Leadership Network (UMLN) convening in Austin, Texas.

How, if at all, is the structure of this weeklong professional development held in June related to that convening in February?

What did the participants of the UMLN convening take away from their February 2017 time in Austin, Texas, and how is that takeaway affecting their work in their district months or even years in the future?

This case study, conducted by evaluation staff of the Charles A. Dana Center at the University of Texas at Austin, takes an initial step toward answering those questions.



## Part I. The History and Mission of the Urban Mathematics Leadership Network

In fall 2007, the Charles A. Dana Center at the University of Texas at Austin and the Aspen Institute launched three coordinated networks of urban district leaders: the Urban Mathematics Leadership Network, the Urban Literacy Leadership Network, and the Chief Academic Officers network.

The Dana Center, led in this work by its executive director (and professor of mathematics and of public affairs) Uri Treisman and by the Center's then-director of mathematics Dr. Susan Hudson Hull, launched the Urban Mathematics Leadership Network in 2004 because the Center's leaders saw a need in the school districts they visited and worked with.

Before the UMLN, says Treisman, "no one knew each other. Chicago, New York, LA, all of them were working on the same problems." He continues, "It's just so hard to do leadership in urban math districts. We need to build on each other's work—then patterns emerge."

This lack of communication across school districts tackling similar challenges is one of the main problems that the UMLN was founded to address. The UMLN is designed to bring people together and to give math leaders a chance to connect with each other away from their district.

Each year from 2004 to 2017, the Dana Center has held at least one UMLN convening, bringing together teams of representatives from districts in the network. These convenings provided information to the district teams and, most importantly, gave them time to collaborate as a group and with other groups from urban districts around the country.

According to internal Dana Center writing about the project, "the goal is to enable colleagues who often work in silos to collaborate in building district capacity and identify common tools and strategies for improving instructional outcomes."

In describing the program's goals, Brian Newsom, a former Dana Center staff member who helped lead UMLN from roughly 2010 to 2017, said that its purpose is "to bring math leaders of urban school districts together to find a solution for common problems." He went on to describe the particular issues faced by math leaders in large urban districts. "What happens is that you have these math leaders of urban districts, and they are the largest district in the state. They don't really have anyone within the state with the same problems that they are having." He continued, "At UMLN they are able to talk to someone with the same kinds of problems that they have."

Katey Arrington, another of the UMLN's Dana Center staff leaders, described UMLN as having three chief goals:

1. To give district math leaders a chance to learn from each other.
2. To enable the Dana Center to support professional learning for the leaders to inform their work.
3. To provide Dana Center staff the chance to learn from the challenges and successes reported by the district leaders.

From 2015 to 2017, the UMLN workshop goals focused primarily on supporting districts in implementing education standards—particularly the Common Core State Standards for Mathematics, adopted by many of these districts' home states. In particular, the UMLN sought to improve the capacity of its member districts...

"The UMLN has functioned as an effective mechanism for reflection on district practices and as an important partner in developing and disseminating effective strategies and research-based tools."

Charles A. Dana Center web page on UMLN<sup>5</sup>



... to communicate consistently and effectively about the Common Core State Standards for Mathematics.

... to provide high-quality, coherent professional development to support effective implementation of the standards.

... to monitor and adjust implementation of the CCSS for Mathematics to support fidelity to the standards' vision.

While the UMLN initiative launched in 2004, the UMLN collaboration with the Aspen Institute began in 2007. Aligning the work of the UMLN with other work going on in the district, including the work of chief academic officers, was designed to make sure that the districts' key decisionmakers are a part of the conversation.

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## Part II. The Philadelphia Context

The School District of Philadelphia<sup>6</sup> is a large urban district with more than 200 schools serving over 125,000 students. Philadelphia's curriculum and professional development for teachers revolves around what are now called the "PA Core Standards" (formerly the "Pennsylvania Common Core").<sup>7</sup>

Initially, the district had focused its efforts largely on working with teachers around literacy and the English Language Arts standards. More recently the district has been making an additional investment in mathematics, and many schools are now including mathematics as part of schoolwide planning. One indicator of this shift is the district's commitment to train its nearly 3,000 elementary, middle school, and Algebra I teachers to work with the mathematics standards for learning and district curriculum by the summer 2018.

The district has invested substantially in new materials for teachers, guaranteeing that each mathematics teacher in the district has materials aligned with the PA Core Standards. But as of 2015, many teachers had not had training on these materials. As described by Philadelphia's director of mathematics, the district's MathCounts institutes were designed to fill this need and to "support teachers' professional growth, enhancing their instructional toolkits, and helping to support the type of ambitious teaching that conforms to not only the shifts embodied in the Common Core, but also [to] what has been learned from research for the past 30 years or more."

In June 2016, the district hosted the first MathCounts Institute, working with about a third of the schools in the district. These institutes, which take place over one week each summer, are the first large-scale mathematics professional development put forward by the district in close to ten years.

The district's mathematics content team itself is a very new entity, consisting of a Director of Mathematics and three content specialists. While each of the mathematics content team members is experienced in mathematics education and in working with the district, they are new to working together as a team.

At the time of the first (2016) MathCounts Institute, the director of mathematics had been in the district for only a week, and the mathematics content team was staffed with only one content specialist. That staff member worked with Carnegie Learning to plan the first summer institute and the follow-up on-campus coaching also conducted by Carnegie, largely letting Carnegie take the lead. Close to a thousand teachers attended the first MathCounts Institute. At the time that members of the School District of Philadelphia mathematics content team attended the UMLN training, they were a month away from starting to plan for the second (2017) summer institute.

"Both of us are not new to Philadelphia as a city, but new to our roles. We're feeling like, where do we start?"

Member of the Philadelphia district team at the 2017 UMLN convening



### Part III. Philadelphia's New Staff at the UMLN Convening

The February 2017 UMLN convening was at the Lost Pines Resort in Cedar Creek, Texas. During the day, two members of the School District of Philadelphia's mathematics content team—the director of mathematics and a math curriculum specialist—worked together and with other urban districts while learning from guest lecturers including Dana Center director Treisman and David Bressoud, director of the Conference Board of the Mathematical Sciences and former president of the Mathematical Association of America.

“It's almost like we're holding a mirror to ourselves.”

Conversation among Philadelphia and Denver school district math team members

UMLN convening participants engaged in the meetings and presentations during the day and enjoyed dinner as a group in the evenings. Over plates of local fare, participants could be overheard talking about their districts, their initiatives, and their lives away from work.

#### Unconferences

The Philadelphia district's team participated in two “unconferences” with other districts. In each unconference, participants spend 45 minutes to an hour talking with other network members—in this situation, two new members from the Pittsburgh Public Schools. Both groups were excited to find common ground with leaders from another district familiar with the particular Pennsylvania context.

In a separate unconference, this one with representatives from Baltimore City Public Schools, the two district teams talk about the small number of mathematics coaches available in their respective districts. The Philadelphia team describes having 12 Carnegie MathCounts specialists for 200 schools, and a representative from Baltimore City replies that they have 10 coaches for 155 schools. The director for Philadelphia later noted the kinship he felt talking to another district working in a similar context.

#### Consultancy

The next day, the Philadelphia team spends an afternoon in a “consultancy” with UMLN members from Denver Public Schools. *Consultancies*—structured discussions of challenges or dilemmas facing a district—are a staple of the UMLN, providing district leaders with the opportunity to share district struggles and receive feedback from peers in other districts.

In a consultancy, each participating district captures an issue in writing, and then shares the description with a district partnering with them in the consultancy. The partner district then has time to ask questions and discuss the dilemma before the district posing the issue is given the opportunity to respond.

The School District of Philadelphia's team posed the following issue:

How do we support teachers with professional development that can help them

- 1) believe that students are able to do grade-level content,
- 2) teach grade-level content, and
- 3) find entry points to support students who are not yet performing to grade-level expectations

The team from Denver Public Schools asked clarifying questions, and it emerged that the Philadelphia central office hadn't had a large-scale, comprehensive, professional development program for mathematics teachers in almost ten years. There had been local and network-based professional development offerings in mathematics, but nothing for the whole district with an eye toward evidence-based best practices.

Denver staff asked probing questions: How many math specialists per network? What is the history of professional



development for mathematics in Philadelphia? Could the team begin this work on a smaller scale? Crucially, the team from Denver asked about what was *working* as well as about what the Philadelphia team saw as a struggle.

And then the Denver team discussed among themselves what they heard. They talked about the Philadelphia district in effect starting from “square one with the [new] standards.” They wondered if someone could help the Philadelphia district to develop a big picture. The Denver team talked about possibilities for the Philadelphia team, such as engaging in turnkey professional development and online professional development, and spending time as a team unpacking the district’s new materials for mathematics teachers.

What resonated most with the Philadelphia team was the idea of *developing a big picture*.

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## Part IV. Ongoing Connections Across Districts

For the Philadelphia district’s director of mathematics, having the opportunity to talk with representatives from other large urban school districts was the most significant aspect of the UMLN convening: “Getting a chance to meet people and get to know them and their perspective was invaluable.”

“These contacts were particular and deeper after having a chance to be face-to-face with each other.”

Director of mathematics, School District of Philadelphia

The Philadelphia director believes that he would not have been as inclined to reach out to these individuals without meeting in person.

Katey Arrington, a Dana Center staff leader for UMLN, noted that one of the key purposes of the UMLN convenings—including the convening that the Philadelphia team attended—is to give districts the opportunity for these face-to-face interactions. “The UMLN team plans the unconference and the consultancies so that districts can make connections.” Even events as seemingly unplanned as the informal dinners are built in to the convening to give district representatives another opportunity to connect.

After leaving the spring 2017 convening, the Philadelphia director of mathematics kept in touch with peers from UMLN districts around the nation, including leaders from Pittsburgh Public Schools, Boston Public Schools, Charlotte-Mecklenburg Schools, and District of Columbia Public Schools. Post-convening conversations have included phone calls with representatives from Charlotte-Mecklenburg Schools that led to the CMS group visiting Philadelphia to see how the school district was using its new mathematics resources. The director noted that “CMS math leadership talked with us several times—and visited us—to discuss our implementation pathway for one of our core instructional programs. They were considering adopting the same program.”

The Philadelphia math director has also had multiple conference calls with representatives from District of Columbia Public Schools, learning from that district’s staff about their blended learning team and how they are supporting teachers in blended learning (courses that blend online content and instruction with traditional classroom teaching). They have also talked about content from the UMLN convenings, specifically David Bressoud’s talk about multiple mathematics pathways.<sup>8</sup> “Specifically, we have discussed pathways and curricular resources related to quantitative reasoning courses in upper grades (non-AP courses),” said the district’s director of mathematics. “We even posted messages collaboratively on this topic through the UMLN listserv.”

The director has also kept in contact with the team from Pittsburgh Public Schools, a group that understands the Pennsylvania context in ways that other teams could not.

The director of mathematics for the School District of Philadelphia has spent time after the UMLN convening learning from representatives of other districts and giving people from other districts the chance to learn from Philadelphia’s experience.



## Part V. Developing A Vision for Professional Development

The Philadelphia mathematics content team member who attended the UMLN convening describes it as both a chance for discussion and reflection within her team and a catalyst for her team to think about the bigger picture. She described the experience: “After being inspired by other people, we were able to make some to-do lists and some plans and some priorities. It was the culture of the room. Everyone feeling like they *could*.”

The Philadelphia director of mathematics agrees, noting that outside the convening, he and his team are often focused on day-to-day tasks, and do not often have the time to talk among themselves about the larger, strategic big picture—nor to get feedback from others (outside of their own district context) on strategy and goals: “This time to really talk to other people can remove the silos that people are in.”

The content specialist attending the convening felt that it was this inspiration along with the time to work together away from distractions that made the largest impact on her team. She says, “even if you had put us in a room [in Philadelphia], we wouldn’t have felt that same collaboration power between us as we felt there [at the UMLN convening]. So I don’t know if it was specific things that were said or done, but it was just kind of the culture of the room. Everybody feeling really motivated and empowered to make an impact in education and math specifically.”

During the convening, the team from the School District of Philadelphia realized that their district math team needed a clearer vision. Their previous guiding principles had been, “Every student is a mathematician; every student is a capable mathematical thinker.” While these principles were still very much in line with their thinking, the team recognized that they needed to be able to clearly articulate what their goals were so that they could then share those goals with the teachers in their district.

The director of mathematics notes that the vision that they had previously “did not contain as many underlying tenets as we felt were necessary to convey a comprehensive message about ambitious mathematics teaching.”

The other team member who attended UMLN notes that the new mathematics team guiding principles “did not directly come out of our meeting at UMLN, but we were inspired to have more of a vision by UMLN.” The team also had the time to start working together on the principles at the convening.

This realization that they needed a clearer vision is evident in the team’s consultancy with Denver. When describing their plans for professional development, the Philadelphia director said, “We do have a lot of people with hands in what’s happening, and we don’t have a clear vision; it seems like that [a vision] really needs to happen.” He talked about not having a good way to express to vendors and to stakeholders within the district the shifts in instruction they were hoping to see from teachers. He ended by stating, “If we don’t know our vision, they *certainly* don’t.”

Once they returned to Philadelphia, the team who had attended the UMLN convening continued working on the guiding principles with a third member of the Philadelphia mathematics content team.

This third team member, a content specialist focusing on mathematics in grades 5–8, describes their thinking about the principles as “what are the things that we need to see in all mathematics classrooms—what do we want to see that we’re not seeing. That’s where they grew out of what should it look like.”

“Being there and being around other people who are doing similar work, [we] just felt a kick in the pants.”

Mathematics content specialist,  
School District of Philadelphia

“If we don’t know our vision, they certainly don’t.”

Director of Mathematics,  
School District of Philadelphia



These new School District of Philadelphia mathematics guiding principles were critical components of instruction that the mathematics content team hoped to encourage through professional development. These five guiding principles<sup>9</sup> are:

- undertaking purpose-driven work**
- offering rich and meaningful tasks**
- promoting equitable discourse**
- encouraging questioning and curiosity**
- valuing diverse thinking**

The Philadelphia mathematics content specialists for grades K–4 and for 5–8 credit these new guiding principles for helping to structure the team’s work with Carnegie Learning to plan the 2017 summer institute. One specialist states, “we came up with guiding principles for the district. That’s what we built the work around.”

A representative from Carnegie Learning, noted the focus on these guiding principles in the summer training. “What they envisioned was that each day that theme [guiding principle] would be evident through everything that teachers were experiencing. They would carry throughout the different sessions and the keynote.”

A Philadelphia district math team member who helped plan the 2017 summer convening with Carnegie Learning, describes the goal of using these principles. “We wanted teachers to walk away with a clear picture of what math instruction could look like if [the] teacher is not standing at the board and then 60 practice problems. Why does it need to be different, and why does it need to be different in Philly. I wanted them to know what a classroom could look like, and why it should look like that.”

The School District of Philadelphia mathematics content team has also developed what they call the “Classroom Look Through,” a coaching tool to help guide Carnegie Learning’s MathCounts specialists to look for evidence of the Philadelphia district’s guiding principles when they visit classrooms. By using this tool, Carnegie MathCounts specialists now use the district’s guiding principles for classroom observation.

In addition, the district has created a “Guiding Principles in Action” document that outlines the kinds of activities that should be visible in a classroom where teachers are honoring the principles. The Philadelphia mathematics content team also agrees that they will use those principles as a framework for professional development moving forward.

The math content specialist for grades K–4 credits attending the UMLN convening not with the content of the guiding principles but with the impetus to formalize their vision: “I think just being there, being around other people who are doing similar work, um [we] just felt like a kick in the pants. Why do we not we have things more together? I mean we have a reason. Reasons that are legit excuses. We’re a totally new office. I had been there for just a couple of months. We weren’t feeling guilty necessarily, but it was like, look at these other districts who have more of a mission or goal, who have a plan. And that just inspired us.”

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## Part VI: Moving Forward and Questions

The two days that representatives from the School District of Philadelphia’s mathematics content team spent at UMLN had far-reaching implications. While each of them took away something different from the convening, each felt that the work that they had done while at the UMLN convening and the work that the convening inspired was important for their district.





## Questions for further consideration

How can the School District of Philadelphia mathematics content team work to solidify their relationships with other districts?

How can the School District of Philadelphia mathematics content team continue to use the guiding principles after the team completes the third year of district-wide mathematics professional development?

How can UMLN staff work to ensure that districts that join the UMLN continue to be actively engaged in the network over time, so that benefits to district leaders and the students they serve are maximized?

## Endnotes

<sup>1</sup>Carnegie Learning collaborated with the School District of Philadelphia to put on this summer institute in 2016 and 2017; a third such institute is planned for 2018. For more information on this event, see <https://www.carnegielearning.com/company/events/summits/mathcounts-2017>

<sup>2</sup>For more on the School District of Philadelphia's mathematics program, see the Office of Curriculum, Instruction, & Assessment website, at <https://www.philasd.org/curriculum/curriculum-and-instruction/core-subjects/math>

<sup>3</sup>The Pennsylvania education standards, previously called the "Pennsylvania Common Core," were renamed the "PA Core Standards" in 2014. The PA Core Standards for English Language Arts and for Mathematics are available via <http://www.pdesas.org/Page/Viewer/ViewPage/11>. The Pennsylvania School Boards Association provides a brief timeline of the standards' evolution here: <https://www.psba.org/2014/09/faq-pa-core-standards-chapter-4>

<sup>4</sup>For more information on the common guiding principles, see <https://www.philasd.org/curriculum/curriculum-and-instruction/core-subjects/math>

<sup>5</sup>For more information, see <http://www.utdanacenter.org/pre-kindergarten-12-education/k-12-systems-services/leadership-networks/history-of-dana-center-leadership-networks>

<sup>6</sup>For more information, see the School District of Philadelphia's website at <https://www.philasd.org>

<sup>7</sup>For more on the PA Core Standards, which are an adaptation of the Common Core State Standards, see the Pennsylvania School Boards Association timeline, available here: <https://www.psba.org/2014/09/faq-pa-core-standards-chapter-4>

<sup>8</sup>Materials from Bressoud's talk can be found at <http://www.utdanacenter.org/pre-kindergarten-12-education/k-12-systems-services/leadership-networks/urban-mathematics-leadership-network/umln-february-2017-retreat>

<sup>9</sup>For more on the guiding principles, see the web page for the School District of Philadelphia's Office of Curriculum, Instruction, and Assessment: Math, at <https://www.philasd.org/curriculum/curriculum-and-instruction/core-subjects/math>



## About these case studies

This case study is one of two interrelated reports that take an exploratory, qualitative look at the ways that two urban districts have participated with the Urban Mathematics Leadership Network, with the goal of describing that participation and the ways that members believe participation in the network has impacted individual and district work. The two case studies are:

- The Urban Mathematics Leadership Network and the School District of Philadelphia
- The Urban Mathematics Leadership Network and Achievement First Public Charter Schools

This project was supported by the Education & Society Program at the Aspen Institute. These studies were conducted by Dana Center senior research analyst Jennifer Dorsey over a period from roughly May 2015 to October 2017. The intent of these case studies is to describe the ways in which UMLN teams are engaging with UMLN-developed knowledge, tools and connections with other districts—and to describe the extent to which network activities are influencing district services with school based-actions.

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**About Achievement First Public Charter Schools:** Achievement First is a growing network of nonprofit college-preparatory K–12 public charter schools in Connecticut, New York, and Rhode Island. In the 2017–2018 academic year, Achievement First served 12,500 students in grades K to 12. The mission of Achievement First is to deliver on the promise of equal educational opportunity for all of America’s children. Achievement First believe that all children, regardless of race or economic status, can succeed if they have access to a great education. Achievement First schools provide all students with the academic and character skills they need to graduate from top colleges, to succeed in a competitive world, and to serve as the next generation of leaders in our communities. For more information on Achievement First, see [www.achievementfirst.org](http://www.achievementfirst.org).

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