



Cahn

**DISTINGUISHED
PRINCIPALS FELLOWSHIP**

MATHifying SFiAM

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2022 Cahn Cohort

ABSTRACT

Across the nation, students struggle with demonstrating proficiency in mathematics. Society, as a whole, has given people permission to say, “I’m not good at math” or “I’m just not a math person”. In school, we have perpetuated the idea that you can either do math or you can't as non-math teachers say the same phrases. Therefore, it was time for us to MATHify our school. We had to break the cycle and start showing our community that everyone can be a math person.

Using a data -informed theory of action we showed our school community the sense of urgency. Systems thinking and an equity lens allowed for us to tackle mindset as the first school-wide shift. We then looked at how we could shift the approach to teaching mathematics to engage more students in authentic learning with the application of mathematical concepts.

We implemented strategies from Stanford’s Big Ideas and Peter Liljedahl’s Building Thinking Classrooms to provide students with mixed-space practice and opportunities for collaboration. All teachers committed to playing math games during Advisory two times per week. We also purchased Math T-shirts for everyone in their grade-level color (6th is white, 7th is red, and 8th is black) to kick-off our MATHifying of SFiAM. The goal was to saturate the campus with numeracy the same way that literacy is usually apparent.

INTRODUCTION

The focus of the CAHN project was to systematize numeracy into our school culture, curriculum, and parent engagement. We needed to focus on building capacity of the teaching staff in order to implement school-wide shifts.

Context:

San Fernando Institute for Applied Media (SFIAM) is a Title I school located in San Fernando, California. We serve a demographic of 98% Latino/Hispanic students, many of which live in poverty. We are an innovative and autonomous school known as a pilot school as part of the Los Angeles Unified School District. There are 782 schools in LAUSD and only 41 pilot schools. We were the first middle school created in 2010 by a teacher led team. We continue to be teacher driven and student centered. An aspect that is unique to pilot schools is the Election to Work Agreement (EWA), which is a one year contract that the Principal and all teachers must sign annually. This one year contract outlines a shared commitment to additional responsibilities such as professional development, participation in student and family events, and committee work. We believe in a distributive leadership model and there are many opportunities for staff to take the lead on projects.

We pride ourselves on personalization and building relationships with our students. We create an inclusive place of learning that empowers students by focusing on Science, Technology, Engineering, Arts, and Mathematics (STEAM) to become functional, prepared, and innovative communicators for the demanding global requirements of the future. We were the first school in the Northeast valley to create a MakerSpace with an emphasis on robotics, digital storytelling, and engineering and construction. We became the advanced prototype site for all of LAUSD. Now we're working on opening a Paxton Patterson Career lab with 13 different stations that focus on careers such as intro to child development, home maintenance fundamentals, flight and drone technology, and intro to culinary arts to name a few.

Benchmark data:

The data points were critical for determining the direction of our project. We have struggled to improve the proficiency levels in math well before the pandemic. Returning to school after the pandemic simply created a greater urgency for us to look at a new approach. Math scores on Renaissance Assessments (2022-2023) show the majority of our students below grade level. 6th grade: 6% at/above grade level, 7th grade: 13% at/above grade level, and 8th grade: 14% at/above grade level. (see Appendix A for full benchmark data from 2022-2023)

Beginning the 2023-2024 school year, our district terminated our contract with Renaissance. We now use the iReady Assessment system. This has caused a lack of continuity in terms of measuring the growth of our students. However, we have been able to get diagnostic data from this school year and use that to determine the next steps to continue the growth.

STATEMENT OF THE PROBLEM

Students enter middle school having learned numeracy in isolation. Real world application and relevance are often missing. Therefore, students are very uncomfortable with the application of numeracy. Our current approach allows for some collaboration, but still lacks authentic engagement and productive struggle. This creates an environment where students do not have a growth mindset and believe they are not good at numeracy. Thus creating apathy and low performance.

Our school-centered question was: How can we redesign the conditions and psychological climate for learning numeracy in classrooms? Our leadership focused question was: How can we create the conditions for our staff to disrupt an outdated pedagogical system in order to bring more relevance and equity for our students?

Exploring these two questions had the power to shift our entire school culture from staff to students to parents. As a leader, this meant I had to be prepared to work with all realms from the most eager to the most skeptical. I had to figure out how to approach the most resistant and math phobic of staff. This meant taking a closer look at my leadership style and how I communicate with staff. I also had to look at the personality styles of staff and ways in which teachers wanted to receive feedback. Any misstep could lead to complete shutdown and full resistance.

I also had to look at the systems I was going to create and how I would align the budget and other resources to meet the goals we set out to attain. The first systematic approach implemented was through Advisory classes. Every teacher meets with a group of their students for 30-minutes each day. In this class we address social-emotional learning, college and career building, and now math. Every teacher committed to playing math games at least two times per week. A new math game is introduced to staff every month. This provides students and staff multiple opportunities to get comfortable with the game before having to move on to something else.

Budgets are always tight and so I really had to prioritize. One way I did this was to invest in a full-time math coach. If I really wanted to see instruction improve, I needed someone who would be dedicated to helping staff learn so they didn't feel the pressure of an administrator. My ally was the best selection for this position. I have been able to coach her in how to work with other teachers and how to make the most out of professional development sessions. We work together to plan a systemic approach to math instructional shifts and follow-up sessions.

I also had to invest in the technology and resources that math teachers required to change the approach to their instruction. Purchasing Promethean boards and standing white boards to use as vertical non-permanent surfaces (vnps), where students can get up out of their seats to work collaboratively and record their thoughts and also easily modify their work, freeing them of the permanence of pencil and paper and therefore promoting risk-taking. This change in instruction increases the engagement for student groups to collaborate and discuss mathematical problems, which is essential to higher achievement in mathematics.

The measures used to track progress of student data is currently the iReady Assessment system. This diagnostic is taken three times a year; beginning of the year, middle of the year and end of the year. It is essential to our program as a measure of achievement. However, another measure is also the willingness of staff to implement math games during Advisory, as that demonstrates their commitment to the task of changing the culture. Another measure is the turn-out for parent engagement opportunities around math instruction. An aspect that we have come to notice is that immigrant parents are not as math phobic as American born parents. This is merely a noticing, no formal data has been collected.

METHODS

We began this cycle of inquiry by analyzing student progress data, but also the culture of our staff and community. Anytime we brought up implementing school wide math shifts, we would get some push back from the staff as they jokingly claimed not to be math people. Therefore, we knew we had to identify a way to lower the effective filters even for our staff. Knowing that non-math teachers were showing a "math phobia" and they are highly educated, that meant that the culture shift was going to have to begin within our building before being able to transcend our school community and beyond.

We began by researching Teaching Mathematics through Big Ideas workshops at Stanford and online. Professor Jo Boaler's belief that students can learn mathematics as a meaningful subject of connected ideas; an approach shown by research to heighten engagement and achievement in the math classroom. Our math teachers attended a day of

virtual professional development led by Dr. Boaler and Cathy Willaims, both leading professionals in mathematics education. This workshop cemented our mission of changing the mindset around mathematics, as they presented their research around beliefs. Not only the students' belief in their own mathematical ability, but also the beliefs of the adults in their lives that every student is capable of high achievement in mathematics. Shifting the mindset and altering beliefs would be key to our project.

We also explored Peter Lilijidal's Building Thinking Classrooms where passive learning environments are transformed into active learning environments with the use of vertical non-permanent surfaces (vpns). The research suggests that little thinking happens in most math classrooms and we know that little thinking leads to small achievements. Providing an environment where students are working on their feet encourages more thinking while in a low risk space (using a non-permanent surface, or whiteboard) creates the conditions necessary for higher achievement.

The next step was to MATHify our school culture. We had to determine how we were going to bring it to the students. We know that student engagement is always higher when they are playing a game. Therefore, what better way to lower their affective filter around numeracy than with low stakes math games.

The math games selected were primarily those that involved the use of basic multiplication facts. Multiplication is a key tool for many areas of math. It is often the basis of difficulty for working with fractions and the root cause of math phobia. By adding the fun of a game to working with multiplication facts we are supporting our students in the development of their confidence with numeracy.

Embarking on this journey, we quickly realized that everyone had a pinnacle moment around learning mathematics. Whether developing a love or hatred for it, most could pinpoint the moment it impacted their lives. So we capitalized on these. We allowed everyone to share their mathematical journey. This influenced the action plan because we knew we had to start with mindset, move to curriculum, and then move to school-wide shifts.

We intentionally targeted 7th grade because my ally taught 7th grade math. We piloted the implementation of strategies to show that student academic growth would happen at a higher rate.

Month	Action	Person Responsible
November-December 2022	Conduct a needs assessment and develop a Problem of Practice	Pearl Arredondo and Erin Fitzgerald
January 2023	7th grade math strategies implemented...	Erin Fitzgerald
February 2023	Parent workshop: How to help their children at home with math	Pearl Arredondo and Erin Fitzgerald
March-April 2023	Budget Development for 2023-2024 SY <ul style="list-style-type: none"> ● Math Coach position ● Math conferences for all math and science teachers ● Promethean boards for all math classrooms ● Standing whiteboards for classrooms (1 for every 3-4 students) ● We're all math people T-shirts by grade level (6th- grade white, 7th-grade red, 8th-grade black) ● Math signage ● Math swag 	Pearl Arredondo
June-July 2023	Plan professional development and additional parent engagement opportunities	Pearl Arredondo and Erin Fitzgerald
August 2023	Deliver professional development for all Advisory teachers regarding math game implementation	Erin Fitzgerald
September-November 2023	<ul style="list-style-type: none"> ● Math Specific professional development series: warm-ups, delivery of instruction strategies, study teams with specific roles and responsibilities, station rotations ● School-wide implementation of math games through Advisory classes ● Parent engagement opportunities through workshops and school-wide events like STEAM Night ● Ongoing monitoring of implementation 	Pearl Arredondo and Erin Fitzgerald

RESULTS

In four months, we had two benchmark assessments to measure student growth. In the 2021-2022 SY we were at -107.1 Distance From Standard (DFS) on California Assessment of Student Performance and Progress (CAASP). The District was at -80.9. Our target was to decrease the DFS by 13 points in mathematics school-wide. We began making pedagogical shifts in the 7th grade math classroom at the beginning of the Spring semester of 2023 because my ally was the 7th grade math teacher. We met our target only in the 7th grade. (See Appendix B for Cohort analysis comparing DFS for each grade level). This meant that the strategies we implemented were working and we needed to scale them up to the other grade levels.

In the summer of 2023, we began implementing the professional development with the staff. We taught them a math game to use during Advisory. The goal has been to introduce one math game per month in order for students and staff to really get comfortable with it before learning a new one. Currently, most teachers are implementing a math game at least two times per week during Advisory. We are still working on monitoring the extent of implementation school-wide.

Guiding the school for 8 years with an earnest approach to lean on staff self-assessed expertise allowed for a developed culture to welcome a cross-section of innovative principles and practices, thus, application of new ideas has a tendency to be well-received. When staff was approached with adding mathematical focused activities in all advisory classrooms, across all grades levels, staff understood that it was important to add to the frequency of strategy to adequately measure impact. The unknown challenge is comprehending the ideology of students and the significance of adding mathematical concepts across the curriculum. This notion will be the next steps to further this work beyond this school year. The subsequent relatable notion would be to collaborate with parents and survey their thought process on differentiating student outcomes and identifying practices that target individuation.

After implementing these initial small strategies, the results proved to be impacted, with a 11 point increase for 7th grade. It was expected to see some data movement and anecdotal evidence of significance; however, we did not anticipate such a significant growth. We expected changes across all grade levels, so there is an analytic need to assess implementation for grades 6th and 8th. The inquiry at this stage would be to expand the impact of my ally's instructional coaching effectiveness for the two other grades and create a scale-up plan for next school year.

REFLECTIONS and FUTURE PLANS

The CAHN fellowship has afforded me an opportunity to not only learn practical strategies to large-scale change, but to learn from colleagues who are also in the trenches of educational reform. The local CAHN colleagues provided a continuous professional learning community and created reflective spaces to brainstorm session learned topics and expand our leadership skills. The sessions were designed to scaffold the vital components of leadership, both successful targets of practical change and the sensitivities we needed to examine more in depth that influenced our leadership lens, from a systems approach to shifting school climate to implicit bias. The principal role can have a unique isolating effect, yet this fellowship disrupted the vacuum that is naturally presented in large unified school districts, and created a sustainable community for collective change.

The systematic approach to change allowed for a progressive method to implementing school-wide change, from a macro level— looking at what future influence on a community level to a micro level— looking at the individualization of my principalship trajectory from a leadership perspective that tended to look mostly at the overview of a vision with the details being shared, developed and executed by staff. The nuisances of my leadership and communication style change as a result of this fellowship. A dedicated focus of the details refined by approach with my staff influencing the minute components of professional development planning and redirecting focus not only on the overall arching goal but purpose of the task and objectives necessary to reach the mission.

Working with my ally this year has been a tremendous growth experience for both of us. We're not just colleagues, but friends and sometimes that can be challenging as expectations tend to be higher and providing effective feedback can be challenging. An area of growth for her has been in communicating. I have seen my ally grow in her communication skills with staff and students. She is much more cognizant of how her messaging will be received. In her new role this year, I have seen her be more intentional with her feedback. She looks for high leverage pieces to work on with staff as opposed to trying to tackle all deficiencies at once.

We've been able to plan professional development together this school year as well. Being able to show her how to analyze instruction from a coaching lens, has been critical to the development of next steps within the math department. She leads this department with confidence and the staff really respects her.

Ally Remarks

As an ally, the Cahn fellowship has been an invaluable experience. Not only because of the sessions on leadership and communication, but also through the interactions with the colleagues in this fellowship. These are accomplished, inspiring, education professionals who encourage my aspirations to do better and be more for my students.

Our February Study Summit was virtual, and while I missed the personal interaction with the other allies and fellows, I found these sessions to be more impactful for self-reflection. Dr. Brian Perkins Strengths Finder session included numerous nuggets of understanding for better communication, but it truly was summed up when he said that “three things matter in schools, RELATIONSHIPS, RELATIONSHIPS, RELATIONSHIPS.”

My Cahn experience has been rooted in relationships. Beginning with my relationship with my principal as she honored me in choosing me to be her ally; the brilliant leaders in education that I have gotten to know and those personal connections made when we gathered together for the out of state summits, away from life’s other distractions. I truly credit this experience for my transition from math teacher to instructional coach. Not only is my new role instrumental in accomplishing our goals for this project, but the sessions on communication coupled with the discussions around key elements of effective communication brought to light my capacity to support teachers in a non-threatening manner to communicate impactful strategies for student achievement.

MATHifying SFIAM is assuredly a journey, but while it may be a long one it is truly worthwhile and one for which I am extremely passionate. Our students deserve to see themselves as capable students of mathematics and our staff has a duty to support this mission.

APPENDIX A

Star Renaissance data by grade level at three points in the 2022-2023 school year.

Grade	BOY Beginning of the Year	MOY Middle of the Year	EOY End of the Year
6th grade	4% at or above	6% at or above	9% at or above
7th grade	9% at or above	13% at or above	16% at or above
8th grade	14% at or above	14% at or above	14% at or above

APPENDIX B

