UNIVERSITY OF MASSACHUSETTS BOSTON
CENTER OF SCIENCE AND MATH IN CONTEXT (COSMIC)

WIPRO SEF

YEAR 11
QUARTERLY REPORT
March 2023

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IN MEMORIAM

This quarterly reports comes out with the members of the Wipro Science Education Fellowship program feeling great loss and heavy hearts. Professor Dorina Kosztin passed unexpectedly on 5 Jan 2023. Professor Kosztin had been a member of the Missouri Wipro SEF team since their joining the national program. She was a Principal Investigator for the Missouri site. Dorina had a passion for physics and physics education that was felt by all who knew her. We will all miss her contributions and will seek her spirit in guiding us as we continue this work in her honor.

A link to her obituary may be found here.

EXECUTIVE SUMMARY

For a decade, the Wipro Science Education Fellowship (SEF) has provided funding and support to science teachers and school districts across the country. The program has national reach with sites in California, Florida, Massachusetts, Missouri, New Jersey, New York, and Texas serving almost 750,000 total students (approximately 1.5% of US pre-K – 12 students). The original phases of the program have focused on developing a cadre of science teacher leaders who lead *from their classrooms*. As the second decade of the program begins a new layer of leadership is being added by engaging more purposefully with school formal district leadership (administration). The goal is to enable district transformation through teacher leadership. At this point most projects at most sites are up and running and progressing toward their goals for the year. Planning is underway for a District Science Coordinator virtual leadership retreat. A new type of site visit has been conducted in Texas and New York to great effect. The continued generous support of Wipro, Ltd. is enabling dedicated, caring, and talented educators across the U.S. to make a real difference in the lives of their students.

Keywords: Teacher leadership, collaboration, district transformation, learning communities

INTRODUCTION

Wipro SEF Program Overview

The Wipro Science Education Fellowship (SEF) is a four-year STEM district transformation program. Cohorts of K-12 teachers participate in a rolling two-year professional development experience designed to improve individual teacher practice, foster teacher leadership opportunities, and create a district corps of teacher leaders. Professional development for fellows is led by a university in partnership with the local school district. The program was developed at the Center of Science and Mathematics in Context (COSMIC) at UMass Boston and is now in 7 universities and ~35 partner school districts throughout the United States.

Year One: Thinking About Teaching

Monthly Fellows Meetings

Fellows from approximately five different school districts gather once a month at the host university to engage in professional development in the areas of instruction, reflective practice, adult learning, and leadership.

Collaborative Coaching and Learning of Science (CCLS) groups

Fellows engage in research-based, structured inquiry into their own teaching and growth. Fellows meet in CCLS teams to share videos of themselves teaching in their classroom as well as sharing student work to learn from each other, to reflect on science content and pedagogy, and to improve their teaching of science. These small professional learning communities determine their own schedules, courses of study, and the lessons they will all be videotaping and observing with support and guidance from their university partner.

Year Two: Implementing the Individualized Growth Plan System (GPS)

Each fellow develops and carries out an individualized growth plan that has a clear vision and identifiable benchmarks. The 100-hour plan focuses on ways to improve the teacher's own instruction and leadership and is developed in collaboration with a university advisor, the district science coordinator and the fellow's principal. The yearlong project includes the fellow leading professional development for other teachers in their school district and culminates with a report and presentation of a poster at the end of year conference.

A District Corps of Teacher Leaders

Over a rollout of three successive cohorts of fellows, each participating school district will have as many as 12 fellows who have participated in the extensive 2-year Wipro SEF

program. These fellows serve as a leadership group for district science and engineering initiatives. This critical mass of teacher leaders sets the stage for district transformation.

Phase II and Phase III – Innovation Phase

After Fellows complete the two-year "foundation" program, District science coordinators work with their University partners in exploring ways in which to build on the Fellows experiences, projects and leadership skills in order to support district transformation. Through various and varied initiatives, Fellows engage with other teachers in their districts. Simultaneously, administrators are made more aware of the resources that the Wipro SEF program has seeded in their schools and districts. This phase of funding is also intended to encourage district incentives to support future work that will continue after this Wipro external funding concludes.

HOW TO READ THIS REPORT

This report captures the work of the Wipro SEF program from December 2022 thru March 2023. It is the second quarterly report of the newest phase of the program. During this time, all sites met the challenges of maintaining and adapting the Wipro SEF program as they adjust to the new "normal" following the Covid-19 pandemic. *The chart below summarizes the activities of this quarter and the activities that took place in this school year. Each site's report includes an overview of the activities that have taken place this quarter. Use the table of contents to locate a site's report.* For a quick look at how the program is influencing individual Fellows please refer to the vignettes in the sections entitled "Featured Fellows." Throughout the report, you will find remarkable stories of Wipro Fellows supporting their students as teachers and supporting other teachers as teacher leaders.

Year	CA Stanford University	FL University of South Florida	MA University of Massachusetts Boston	MO University of Missouri	NJ Montclair State University	NY Mercy College	TX University of North Texas Dallas
2019-2020	Year 2	Year 2	Phase II & Lead Institution	Year 2	Phase II	Phase II	Year 3
2020-2021	Year 3	Year 3	Phase II & Lead Institution	Year 3	Phase II	Phase II	Year 4
2021-2022	Year 4	Year 4	Phase II & Lead Institution	Year 4	Funding ended	Phase II	Phase II
2022-2023	Phase II	Phase II	Phase III & Lead Institution	Phase II	Phase III	Phase III	Phase III

Table of Wipro SEF sites

	Cohort 1	*Cohort 2*	*Cohort 3*	*Phase II*
Year 0	Recruitment			
Year 1	Collaborative coaching and learning in Science (CCLS)	Recruitment		
Year 2	Growth Plan System (GPS)	CCLS	Recruitment	
Year 3		GPS	CCLS	
Year 4			GPS	

Phase II &III				Activities proposed by individual sites.

Key to yearly activities

BY THE NUMBERS

Foundational Phase

Site (Institution)	Districts	Total Students in Districts	Fellows	District Science Coordinators	Presentations and Publications
California (Stanford)	5	97,288	60	5	7
Florida (U of South Florida)	3	398,960	60	3	16
Massachusetts (UMass – Boston)	5	73,688	58 – Phase I 17 – Phase II	5	18
Missouri (U of Missouri)	8	34,162	52	13[1]	8
New Jersey (Montclair State)	5	31,486	60 – Phase I 24 – Phase II 31 – Phase III	5	22
New York (Mercy College)	5	33,580	60 – Phase I 60 – Phase II	5	31
Texas (U North Texas – Dallas)	5	83,160	46 – Phase I 20 – Phase 2[2]	5	28

[1]Over four years.
[2]Plus 5 Non-Fellow teachers for the WalkSTEM project.

Current Phase

Site (Institution)	Projects Submitted	Projects Approved	Alumni Fellows	New Fellows	District Science Coordinators
California (Stanford)	N/A	N/A	60	16	5
Florida (U of South Florida)	5	3	3	0[4]	3[1]
Massachusetts (UMass – Boston)	8	5	TBD	TBD	5
Missouri (U of Missouri)	N/A	N/A	2	7	4

New Jersey (Montclair State)	13	13	13	18[3]	5
New York (Mercy College)	10	6	6	24	3[2]
Texas (U North Texas – Dallas)	14	14	11	22[3]	5

[1] Plus two district administrators.
[2] Plus nine district administrators.
[3] Plus one non-Fellow.
[4] Plus six non-Fellows.

UPCOMING MEETINGS AND MILESTONES

Mar	Apr	May	Jun	Summer	Sep	Oct
6/7 – NY Site visit to districts with Arthur Eisenkraft Eric Weiss, and Anne Gurney	1 – FL In-Person Meeting	2 – NJ All Fellow and District Admin Year-End Meeting	1 – NY Mentorship and Final Site Visits	MO Elementary Cohort 5 Meeting	MA Kick-off Meeting for New Projects	14 – NY MCCSE K-12 STEM Teacher Conference
20 – TX DSC Zoom Meeting to discuss final products of projects	MO Faculty and Fellows HCCLS Work Presentations	23 – NY All Teams and Admins Mandatory Virtual Meeting	15 – FL Phase 2 Cohort 2 Applications Due	MO Elementary Cohort 4 Meeting		
27 – TX Face to Face with Phase III Fellows, CAST President, and Provost	CA School Leaders School Leaders Chosen for School Leaders Institute	26 – TX Annual Wipro Meeting and Dinner	FL End of Year Meeting	CA July Launch Wipro School Leaders Institute		
27 – FL Monthly DSC Leadership Meeting	FL Virtual Session New Call for Proposals Q&A Webinar #1	FL Virtual Project Meeting (All)	MO Conclude Cohort 5 Elementary Recruitment			
CA Tammy and Clover Codd	MA Information sessions for	FL Virtual Session	MA Project Presentations			

Recruit for School Leaders Institute (through June)	Innovation Phase	New Call for Proposals Q&A Webinar #2				
22 – 25 NSTA in Atlanta		MO Half-day conference HCCLS presentations	CA Wipro Fellows HCCLS Presentations			
		MA New Proposal Applications				

Dates of upcoming meetings across all sites (note: dates subject to change).

This table highlights the larger and/or culminating events across sites. Additionally, sites continue monthly meetings with Fellows and DSCs as can be seen in the individual site reports.

UMass Boston Lead Institution- Building and Supporting a Network of Wipro SEF sites

Monthly Leadership meetings

Meetings of representatives from the seven sites in the Wipro SEF program occur monthly to share best practices, plan strategic initiatives, and share progress. The agendas for the January and February meetings are listed here.

18 January 2023

- The upcoming remote Leadership Conference
- Wipro newsletter
- Wipro communications (the NY team-Regina Boriello)
- Updates from sites and group problem solving
- Updates from Wipro (Anurag, etc), Arthur's visit to India and Azim Premji Foundation
- Final sweatshirt order

21 February 2023

- Monthly site updates
- Upcoming quarterly report – discuss template distribution, due date, what worked and what could be improved from last time (December)
- End of year plans for cross-site visits
- Upcoming site visits in TX and NY
- Research update – Brooke Whitworth (Clemson) and Anne Gurney
- DSC database –Creating one for Fellows
- Leadership retreat update
- Trello
- NSTA – who is going? (IHE, DSCs, Fellows)
    - Is anyone presenting any talks, posters, hosting sessions?
- Any upcoming presentations or publications to share/discuss?
- Other

Site visits

This quarter site visits to Texas and New York were conducted. These site visits were different than previous site visits where we visit the University or a conference for an event or celebration. In these site visits we were able to visit Fellows at their schools. These visits were invigorating. Seeing the work that the Fellows are doing in their schools was incredible.

Wipro site visit at Dallas
February 2023

Sunday Feb 26th

Dr. Eisenkraft arrives at 5:47 pm at DFW, Anne will pick him up and come to the restaurant. (King Buffet, Dallas)
Distance between DFW airport and King Buffet: 13-14 miles
Ratna will be at King Buffet at 6:30 pm.

Dinner at King Buffet: 7 pm
Location: 10250 Technology Blvd W, Dallas, TX 75220
Attendees: Dr. Eisenkraft, Anne Gurnee, President Mong, Mr. Kosowski, Dean Remley, Ratna Narayan

Remember to hand over material to Anne.

Monday Feb 27th

District Time Slot	Site	Address	Driving Distance
	Fairfield Inn and Suites	10175 Technology Blvd E, Dallas, TX 75220	
Irving ISD 8:30 - 9 am	Principal Claudia Ruiz, Julien Yacho, Chris Dazer Gilbert Elementary	1501 E Pioneer Dr, Irving, TX 75061-7848	Distance between Fairfield Inn and suites and Gilbert Elem is 5 miles.
Irving ISD 9:30 – 10 am	Principal Amaris Bravo, Kelly Hancock, Chris Dazer John Haley Elementary	1100 Schulze Dr, Irving, TX 75060	Distance between Gilbert Elementary and John Haley Elementary is 4 miles. Distance between John Haley and Lively Elem is 2 miles,
Irving ISD 10:30-11 am	Principal Brittany Phillips, Julian Yacho Chris Dazer Lively Elementary	1800 Plymouth Dr W, Irving, TX 75061	
Julien Yacho and Chris Dazer (Irving ISD DSC) will attend all 3 meetings with you.			

GPISD 11:30-12:00	Principal Dinnah Escanilla, Guillermo Lozano Ochoa STEM Academy	2030 Proctor St Grand Prairie, TX 75051	Distance between Lively Elem and Ochoa STEM Academy is 13 miles,
Ms. Majors (GPISD DSC) will join you for lunch and will attend the meetings after lunch with you.			
12:00 - 1:00 pm **Lunch at a restaurant in the area** **Ms. Majors, Dr. E and Ms. Gurnee**			
1:00-1:30	Principal Erin Whisenhunt, Annette Trammell Ms. Majors Garner Fine Arts Academy	145 W Polo Rd Grand Prairie, TX 75052	Distance between Ochoa STEM Academy and Garner is 4.7 miles
1:45-2:30 pm	Principal Dr. Catherine Bridges Cynthia Cappocci Ms. Majors Florence Hill Elementary	4213 S Robinson Rd Grand Prairie, TX 75052	Distance between Garner and Florence Hill is 1.2 miles.
2:45 -3 pm - 3:30 pm	Tamara Butler, Lindsay Reeves, Kasie Roden Tamara Majors	Natural Science Education Center @ Kirby Creek Park Kirby Creek Park 3385 Corn Valley Road Grand Prairie, TX 75052	Distance between Florence Hill Elem and NSEC @ Kirby Creek Park is 3 miles
			Dr. E flies out of DFW at 6:55 pm Distance between Kirby creek park and DFW airport is 17 miles

Tue Feb 28th

District Time Slot	Site & Contacts	Address	Driving Distance

	Fairfield Inn and Suites	10175 Technology Blvd E, Dallas, TX 75220	
Lancaster ISD 8:30 - 9:15 am	Principal Gail Wright Markus Burkhalter, Jennifer Mosley Faith Milika DSC West Main Elementary School	531 W Main St, Lancaster, TX 75146	Distance between Fairfield Inn and Suites and West Main Elementary school is 27 miles
Cedar Hill ISD 9:45 - 10:15 am	Principal Jared Peters Shiesha McGue Carlece Jackson Jeremy Hesse DSC Bessie Coleman Middle School Kellie Burchfield	1208 E Pleasant Run Rd, Cedar Hill, TX 75104	Distance between West Main Elem and Bessie Coleman Middle school is 10 miles
DeSoto ISD 10:45 - 11:15 am	Principal Manning, Vice Principal Taylor Gayla Davidson Raisha Allen DSC West Middle School, DeSoto	800 N Westmoreland Road, DeSoto, TX 75115	Distance between Bessie Coleman and West Middle school is 2.8 miles
LUNCH at UNT Dallas 11:30-12:30 Anne Gurnee, Dr. N, Dean Remley, Tamara Majors, Raisha Allen, Faith Milika, Danielle Moore (no parking pass necessary)			Distance between West Middle School and UNT Dallas is 8 miles,
Lancaster ISD 4:00 - 4:30 pm	Principal Kimbrough Brittney Preston Faith Milika DSC Pleasant Run Elementary School Lancaster	427 West Pleasant Run Road Lancaster, TX 75146	Distance between UNT Dallas and Pleasant Run Elementary is 6 miles
			Distance between Pleasant run Elementary and Fairfield inn and suites is 25 miles (rush hour)

Quarterly reports, the second report is due March 1st.
Any additional material we discuss in the Wipro Monthly meeting to be collected for the reports will also be collected.

Irving ISD STEMing to STAAR	https://docs.google.com/document/d/1XRIPz1oqmK2vgHInz-i0YV1tDhTlOIm9WZnZCaz1aS8/edit?usp=sharing
Grand Prairie ISD What Properties matter	https://docs.google.com/document/d/1U9LQwjcQ_YDz-I7aoacHfHkAVc_2WI9y7mPXkrkXwnQ/edit?usp=sharing
Grand Prairie ISD GFAA STArts Club	https://docs.google.com/document/d/1rh1gBEhNNEMatHughkodLJgB_bxgH97Zh7DxZpUJYH4/edit?usp=sharing
Grand Prairie ISD Edible Gardening	https://docs.google.com/document/d/1F4nq4dHMcjT0GNgBHLr7ctEV15Sh9gKBAMMuWUAAFlo/edit?usp=sharing
Grand Prairie ISD NSEC Enrichment for Middle School	https://docs.google.com/document/d/1aWbOdjY6w8LhDYuTFGWluI4usZdusnefIEAGchByJpA/edit?usp=sharing
Lancaster ISD 5th Grade Science Teacher PLC	https://docs.google.com/document/d/1OKXT2cr2c858eflRcWRZ8xPVO2eDrj6APrm3QHrXpl8/edit?usp=sharing
Cedar Hill ISD Effects of Collins Writing in 8th grade Science	https://docs.google.com/document/d/1J-xcZlm5qoJbLYqO_bUhXdMiEOwEQDMsc5bW27yRpbY/edit?usp=sharing
DeSoto ISD	Just started their project mid Jan

New York site visit

The New York site visit was another great success. The Mercy College contingent was gracious, generous, and welcoming. The Fellows and Principals were amazing! The agenda for this visit and some pictures are shared here.

Arthur, Eric and Anne Visit to MCCSE and the GNY Districts

March 2023

Sunday March 5th

AE and AG fly in – check in to hotel

Monday March 6th

Attendees: Kristen Napolitano, Arthur Eisenkraft, Anne Gurnee, and Eric Weiss

District Time Slot	Site	Address	Driving Distance
7:00 am	KN, AE, AG, EW meet at Spring Hill Suites	480 White Plains Rd, Tarrytown, NY 10591	
7:30 – 8:10 am	George Washington Elementary -Meet with White Plains teachers	100 Orchard St, White Plains, NY 10604	Distance between Spring Hill and George Washington Elementary is 5 MILES.
8:30 am	Mamaroneck Avenue Elementary -Meet with Principal R. Janowitz	7 Nosband Avenue, White Plains, NY 10605	Distance between George Washington Elementary and Mamaroneck Avenue Elementary is 3.4 miles.
9:30 am – 12:00 pm	Coffee debrief, meeting, and early lunch – joined by Amanda Gunning, Mary Ushay, and Meghan Marrero	828 S Broadway	Distance between Mamaroneck Avenue Elementary and 828 S Broadway is 9 miles. Distance between 828 S Broadway and Edison Elementary is 14 miles.
12:15 pm	AE, AG, EW, and KN head to Edison Elementary -Meet with gardening group (Colleen, Carrie, Georgina)	132 Rectory St, Port Chester, NY 10573	
1:10 pm	Edison Elementary -Meet with engineering group (Marcia's group)	132 Rectory St, Port Chester, NY 10573	
1:45 – 2:15 pm	Edison Elementary -Meet with J. Fuller and R. Roncagliolo (AP and Principal)	132 Rectory St, Port Chester, NY 10573	

3:00 – 3:30 pm	Jefferson Elementary School -Meet with New Rochelle teachers (Aimee's group)	131 Weyman Ave, New Rochelle, NY 10805	Distance between Edison Elementary and Jefferson Elementary is 13 miles.
3:30 pm	AE heads to airport AG brought back to hotel OR Tarrytown offices		

Tuesday March 7th

Attendees: Kristen Napolitano and Anne Gurnee and Eric Weiss

District Time Slot	Site & Contacts	Address	Driving Distance
	Spring Hill		
11:30 am	*Trinity Elementary School -Meet with M. Hilderbrand*	*180 Pelham Rd, New Rochelle, NY 10805*	*Distance between Spring Hill and Trinity Elementary School is 21 miles*
12:00 pm	Trinity Elementary School -Meet with New Rochelle teachers (Anne Marie's group) —bring your own lunch	180 Pelham Rd, New Rochelle, NY 10805	
12:30 pm	AG heads to airport OR back to Tarrytown offices		

Meeting in New Rochelle at Jefferson Elementary School.

Arriving for the first meeting of the visit at George Washington Elementary in White Plains.

Fellow Anne Marie with poster from STEAM fair (Wipro project) at Trinity Elementary in New Rochelle.

Site Visit Report

wipro | Science Education Fellowship

SITE VISITS 2023 – TEXAS & NEW YORK

SUMMARY

3.27.23

Introduction

This report summarizes site visits to Wipro SEF partner sites in Texas and New York in late winter 2023. In both states, Program Director, Arthur Eisenkraft, and Wipro SEF independent evaluator, Anne Gurnee, visited multiple schools, learning about projects underway from active Wipro SEF Fellows and administrators. In New York, we were joined by Associate Program Director, Eric Weiss. While the conversations were brief and conversational in nature, in all sites, we sought to hear about the frontline experiences in conceiving of and executing diverse projects in their school settings. We also asked about obstacles they faced and what additional support Wipro SEF could provide. This summary (produced by Anne Gurnee Consulting, LLC) includes an overview of the sites visited, observations, and insights gleaned from the diverse and dynamic Wipro SEF Fellows and District Science Coordinators with whom we conversed.

Texas Site Visit Information

Date	*Schools Visited*	*District*	*Project Summary*
February 27, 2023	Gilbert Elementary	Irving ISD	STEMing to STAAR – Collaborating team of 5th grade science teachers at each school; creating videos that incorporate movement to help students with access to and retention of science content; presented bilingually
	John Haley Elementary	Irving ISD	
	Lively Elementary	Irving ISD	
	Ochoa STEM Academy	Grand Prairie ISD	Which Properties Matter? – Bilingual educators working with grades 2 & 3 explore the properties of matter through engineering/design process.
	Garner Fine Arts Academy	Grand Prairie ISD	GFAA ST*Arts* Club! – Creating/hosting afterschool science club; participating students are specifically targeted who are identified as struggling and teacher nominated
	Florence Hill Elementary	Grand Prairie ISD	Edible Gardening – Creating an edible garden using Quirkles as the curriculum. Large special needs population.

	Natural Science Education Center @ Kirby Creek Park	Grand Prairie ISD	NSEC Enrichment for Middle School – Expanding an existing outdoor science program to include middle school offering a hands-on learning review for the STAAR.
February 28, 2023	West Main Elementary	Lancaster ISD	All Hands on Deck: The Impact of Hands-on Activities on Science Instruction – Horizontal collaboration team focusing on three major science themes with a hands-on focus to tackle learning gaps.
	Bessie Coleman Middle School	Cedar Hill ISD	Effects for Collins Writing in 8th Grade Science – Using Collins writing, a district initiative, to improve writing and reading comprehension in science classes.
	West Middle School	DeSoto ISD	Preparing Students for STAAR 2.0 –Working to create engaging, interactive activities that align with the new STAAR redesign to improve students familiarity with new question types.
	Pleasant Run Elementary	Lancaster ISD	5th Grade Science Teacher PLC – Creating a PLC of 5th grade science teachers in the district to help improve science teaching.

Key Takeaways from Texas

- School culture – The importance of a strong school culture was evidenced and mentioned by many. The culture, if supportive and positive, has a ripple effect through the teachers and the students at the school making projects such as these possible and likely more effective
- Data – Texas schools are very focused on the importance of data and appear to use it regularly to drive their instructional decisions. The data came from both district and state tests.
- Informal science education techniques – At both NCEC and Florence Hill Elementary, the legacy of the previous work done by UNT Dallas and the Fellows to partner with informal science education sites was very evident. These two sites demonstrated how important these Fellows felt it was to provide hands-on and often outdoor science learning experiences to their students.
- Writing – For both middle schools involved, writing was at the core of their projects. These schools had recognized a high need to improve their writing outcomes for middle school students and chose to marry this need with their science instruction to provide a unique angle to work on this common challenge.

Challenges In Texas

- Time – Both the time to do the project work, but also notably the time for collaborating teachers to meet together to plan. Further, teachers mentioned the challenge of getting classroom time for science instruction (specifically at the elementary level).
- Science testing in specific grades – Science is tested in 5th and 8th grades in Texas which means that Fellows struggle to get "attention" for science in younger grade levels in elementary.

New York Site Visit Information

Date	*Schools Visited*	*District*	*Project Summary*
March 6, 2023	George Washington Elementary	White Plains	District STEM Hub – Building a virtual STEM hub for district elementaries with a host of STEM resources including full STEM lesson plans.
	Mamaroneck Elementary	White Plains	
	Edison Elementary	Portchester	Gardening Project – Working to recreate their entire (but limited) outdoor space with a diverse array of resources including a STEM learning garden (beds and vertical).
	Jefferson Elementary	New Rochelle	Engineering/SEL Project – Combining engineering, computer science and SEL to create a unique interdisciplinary project for elementary.
March 7, 2023	Trinity Elementary	New Rochelle	Engineering Project – Working in horizontal team with 2nd/3rd grade to create a collection of engineering activities aligned with NY standards.

Key Takeaways from New York

- Hands-on science learning – All the projects in New York had hands-on learning at the core. There was a keen desire by many of these teams to use hands-on learning to improve science teaching and student engagement.
- Computer science – New computer science standards are coming soon to New York, and several of the teams had computer science and/or engineering elements included.
- Social-emotional Learning (SEL) – The project at Jefferson Elementary was unique in its focus on both computer science and SEL. The project team (which included school psychologists) recognized the need for improved SEL and devised a project to tackle this challenge.

- Interdisciplinary learning – Several of the New York projects showed rich interdisciplinary learning projects that married science topics with others such as art and reading. (One involved educator said they were hoping for "standards + heart."

Challenges from New York

- Time – Like Texas, teams in New York lamented that lack of time to do the project work, the time for collaborating teachers to meet together to plan, and of getting classroom time for science instruction (specifically at the elementary level).
- Science testing in specific grades – Like Texas, science is tested in 5th and 8th grades in New York which means that Fellows struggle to get "attention" for science in younger grade levels in elementary.
- Hands-on learning – Some of the usual challenges with hands-on learning surfaced in New York such as concern about mess, materials needs, the need to be more organized to do these kinds of lessons, etc.
- District change – Upheaval at the district level impacts all and threatens to sap the energy of quality educators. One of the threats: "Burnout from lack of stability at the district."

DSC Virtual Leadership Retreat

Planning is underway for the DSC virtual leadership retreat. The DSCs have been surveyed and five topics have been chosen. Facilitators and dates are being finalized. The DSCs have shown an interest in the following five topics (top five from a list of ten):

1. Latest trends in science education
2. Teaching controversial topics
3. District transformation – what does it mean to you
4. Building relationships in the district
5. What resources are available

Invited Papers and Presentations

Arthur Eisenkraft presented a paper, "Science Teacher Leadership" at the New Perspectives in Science Education International Conference in Florence, Italy (March 16-17). After sharing elements of the Wipro SEF program, a lively discussion ensued regarding how we measure student achievement outcomes from professional development. Student achievement is not limited to scores on standardized tests but can also include additional experiences that they have had (e.g. astronomy clubs, outdoor education) and how these experiences may impact their desire to enroll in more science classes and/or provide a life-long interest in science. We should keep in mind that "everything that can be measured isn't always important and everything that is important can't always be measured."

CALIFORNIA- STANFORD UNIVERSITY

The CA Wipro Team's vision for developing teacher leadership in the Wipro SEF Program focuses on developing science teachers' leadership practices and broadening their perspectives beyond the classroom by applying their leadership skills within their school and district contexts. To meet these goals, the CA Team has begun investing in district teams from the five partner school districts by creating individualized plans that meet the needs of each district. These plans have been co-constructed with District Coordinators with input from past Wipro fellows. The goal of this work is to develop each team's collective capacity to advance high quality science teaching and learning in their districts that align with NGSS and reduce the persistent inequities that pervade science education.

The CA Team is also launching a Wipro School Leaders Institute which will bring together school leaders from across the five districts and build their capacity to support high quality teaching and learning at their school sites and support the goals of the Wipro Program.

Summary of Current Project(s) and Goals

Wipro Fellowship Program- Cohort 4

The CA site welcomed 16 new fellows from across the five partner school districts in the fall of 2022. We hope to continue to build the capacity of science teacher leaders within and across districts to further excellence in science teaching and learning. With that in mind, our goals have been to integrate the NGSS dimensions along with an emphasis on the nature of science as well as address equity in science classrooms by focusing on multilingual learners, who comprise a large percentage in our partner districts. The structure of the CA Wipro SEF Program for these new fellows follows the traditional Wipro model, with an emphasis on doing the V-CCLS and H-CCLS reflective practice work in the first year and GPS Projects in the second year.

The CA site is also currently working with district teams from the five districts with the aim of developing their collective capacity to advance effective science teaching and learning in their districts that highlight NGSS, address the needs of multilingual learners and support elementary science teachers' commitment to maintaining rigor in their science classrooms. Concurrently, the CA site is developing a program specifically for school leaders (principals and assistant principals) with the aim of building their instructional leadership capacity and creating strong district teams that will support the overall goals of the Wipro SEF program. The CA Team hopes that building capacity at all levels of the system (classroom teacher, school leader, and district) will lead to transformational changes at the site and

district levels and that these strong teams will address persistent inequities that pervade science education.

Progress and Highlights

Professional Learning Sessions

The CA site continues to facilitate monthly professional learning sessions for Cohort 4 Wipro fellows. The focus of the sessions aligns with the following ideas:

a) Next Generation Science Standards- What does this look like in practice?
b) Equity & Social Justice- Who are we serving?
c) Leadership - What does it mean to be a teacher leader?

V-CCLS Presentations

Since our last report, the highlight of our PL session has been the V-CCLS presentations which were conducted virtually. The V-CCLS work focused on a common science Disciplinary Core Idea (DCI) and one tenet from the Nature of Science (NOS) as explained in the chapter, Understanding the Scientific Enterprise: The Nature of Science in the Next Generation Science Standards. Five V-CCLS groups presented their work, each highlighting their common DCI and course of study related to the Nature of Science. Fellows shared their reflections and learnings from their time together and described how they applied the research articles that they chose to ground their collaborative work.

H-CCLS Work

H-CCLS groups have been established and fellows have chosen their NGSS Practice and Course of Study for their H-CCLS work. For their Course of Study, the CA Team decided to have fellows choose one of the following tenets that support the science learning of multilingual learners.

- Tenet #1: How do you provide multiple meaning making resources for your students and help your students communicate their understanding through both text and other modes?
- Tenet #2: How do you enhance the participation of your students by bridging their cultural and linguistic resources with the science activities?
- Tenet #3: How do you support your students to use SEP to engage in productive and receptive language functions and develop metalinguistic awareness?

Fellows have started their H-CCLS cycles and will be presenting their learnings at the End of Year Conference in June 2023.

Wipro Incentives

The CA site is offering incentives to the current Cohort 4 fellows to work with other teachers at their site to address the need for more collaboration with other teachers around science teaching and learning, outside of what their schools and districts provide.

CA site will also pay the registration for fellows who have *accepted* proposals for the California Association of Science Educators (CASE) Conference or NSTA Conference this year. We have currently one V-CCLS group who have submitted a proposal for CASE.

District Teams

Each district has been assigned a CSET Coach to co-construct a plan on how to support their district teamwork that includes past and current Wipro fellows. The following list shows the coaching assignment and a description of the overall district plan:

Mtn. View Whisman School District	Preetha Menon	Working with the District Coordinator, Preetha has co-facilitated a district wide PL session to support equitable opportunities to participate in science discourse to determine how to leverage the strengths of the Wipro fellows to improve science instruction across the district. Similarly, Preetha will continue to support the District Coordinator next month in a district wide professional learning session focused on middle school science teachers.
Moreland School District	Tammy Moriarty & Preetha Menon	Elementary Wipro Fellows across the district have emerged as leaders in their district and conduct science professional learning for other K-5 teachers. These fellows regularly present their work at different school sites. The CA team is working with two middle school teachers and the district EL coordinator at Moreland Middle School. Starting with a "CCLS" type of collaboration with teachers, the focus of this collaboration is on multilingual learner (ML) support. We are currently addressing supports in the form of technology to support their MLs and

		ways to integrate language into both science and math.
San Francisco Unified School District	Tammy Moriarty	Tammy is working with the Eric Lewis, the District Coordinator, to support him in his work with the Wipro Fellows. SFUSD is currently undergoing some major systemic challenges, so the plan is to keep teachers feeling supported and sustained as much as possible.
San Jose Unified School District	Tammy Moriarty	Tammy is working closely with Diane Aronson to plan her work with secondary Wipro fellows from her district. Many Wipro fellows at SJUSD continue to actively participate and contribute to district wide science initiatives and have led the way for much of this work. This work includes leading professional learning for others as well as participating in curriculum adoption processes.
Campbell Union High School District	Tammy Moriarty	Tammy is working with Emily Hanson to do site walk-throughs of every high school in the district, particularly the schools with a concentration of Wipro fellows. The purpose of their walk-throughs is to get a clear sense of the kind of science instruction that is occurring and to make a plan on how to leverage Wipro fellows' expertise in the district.

Plan for the Next Two Quarters

Date	People	Activity
Jan - March 2023	Tammy + Campbell Curriculum director	Site visits with Campbell District along with Dir. of Curriculum and Instruction
Ongoing till June 2023	Tammy & Clover Codd	Recruitment & planning of Wipro School Leaders Institute with Superintendent of Moreland School District, Dr. Clover Codd

Ongoing till May 2023	Tammy + Preetha	District Coordinator meetings
Monthly meetings with all Fellows till June 2023	Wipro Fellows + Stanford Coaches	Professional learning and ongoing coaching
April 2023	Tammy & Clover Codd	Final Selection of participants for the Wipro School Leaders Institute. Prep for summer intensive institute.
April 2023	Janet, Preetha, and Brandi	NARST presentation on analysis of leadership practices as described in GPS projects of Cohort 2 Wipro Fellows.
June 2023	Wipro Fellows	HCCLS presentations at the End of Year Conference
July 2023	Tammy + Clover	Launch Wipro School Leaders Institute (4 days, in-person at Stanford)

Featured Fellows

Meghan Perfect (Cohort 4 Fellow) K-5 STEAM Teacher, Monta Loma Elementary

Mountain View Whisman

I stepped into the role of K-5 STEAM teacher for my school and started to hear about the Wipro Science Education Fellowship program from colleagues in my district. I was intrigued by the opportunity to work with other teachers in my community and develop as a science educator to support my students. Since starting the program, I have enjoyed connecting with educators both within and outside of my school district. We have had the opportunity to discuss the joys and challenges of teaching science, collaborate on designing learning experiences for students, and consider methods of supporting and validating student language and culture identities within our science classes.

We started out the program in VCCLS groups to collaborate in a vertically-aligned group. My group included a 5th grade classroom teacher, a middle school science teacher, and a 9th grade biology teacher. I focused on my 4th grade students for the purpose of our work together. We all selected topics involving energy, and focused on the idea that scientific knowledge is open to revision with new evidence. We selected a research article to guide our work together and observed how our students across grade levels and school districts approached science knowledge and evidence. I valued using the foundation of research to guide our work, and the ability to collaborate and receive feedback from such creative and dedicated educators.

I have appreciated the opportunity to learn from our coaches at Stanford as well as the other members of our cohort. It is incredible to share a learning space with educators who have such a diverse wealth of knowledge and experience, and who share a passion for both science and supporting all students equitably in education. I look forward to continuing in this work together, and I appreciate the opportunity to participate in this program.

Ranen Bhattacharya, District Coordinator, Mountain View Whisman

As an instructional coach and science teacher, I'm always struck by the irony of the way that schools are designed. We seek to create a space in the classroom where student talk fosters critical thinking, yet most of our own professional day is spent in isolation. We seek to have students learn collaboratively in the classroom while we often use meetings to talk about what needs to be done. Those realities are what makes my Wipro experience so unique. It has allowed myself and the teachers I support to take time out to become the students we seek to create, to engage in the type of rigorous, inquiry-based learning, that we want our students to engage in. One thing that has become clear for the teachers I work with is how doing this has made them more conscious of the system. I use that word system purposefully - in science we often think about systems in terms of inputs and outputs. We acknowledge and embrace the idea that without understanding all these components and their relationships, it is impossible to improve a system. I've seen firsthand how Wipro creates teachers that better understand standards, progressions, and their role in the NGSS ecosystem. My work with other district coordinators has helped me personally, to understand rates of change in education and become more thoughtful about what to push for, when, and why. For that I am thankful!

Our goal in this project is to continue our empowerment of the Wipro Fellows. It is unusual for educators to choose their professional development path much less spearhead a project with it. In this phase, fellows are able to further enhance what they have learned from Phase 1 to increase the district wide impact. The continued personal vested interested in their Phase 2 projects make them the champion for it, as well as involving other individuals (administrators and additional teachers) to help them work towards the overarching goal of district transformation.

Summary of Current Project(s) and Goals

We have three projects that were accepted and we have two more that could possibly be accepted as year 2 projects. For this summary we are only focusing on the projects that are ongoing in year 1.

Nicole Holman - BSCS 5E Instructional Model at Jule Sumner High School
This professional learning experience aims to deepen participants' understanding of the BSCS 5E Instructional Model to support planning for instruction and assessment aligned with the Next Generation Sunshine State Standards (NGSSS) and A Framework for K-12 Science Education. The project's goal is for participants to learn how to develop phenomena-based 5E instructional sequences to support coherent storylines and conceptual flow aligned with the NGSSS and A Framework for K-12 Science Education. The goal is to develop lessons that can be shared with the District and increase engagement in science learning through the 3-Dimensional learning experience. In the immersion of the 3-Dimensional learning experience, students explore the biology content standards by practicing science and engineering and applying the crossing-cutting concepts. The team will develop instructional sequences for each unit in the biology curriculum, implement them, and refine the lessons after teaching them. The team will share their results with the district to expand the practice of utilizing the BSCS 5E Instructional Model in other areas.

Michele Wiehagen and Melissa Triebwasser – They are working on two proposals together.
Proposal 1 Teaching Standards via Small Group Instruction
Melissa is taking the lead on this project. It supports a new district initiative of bundling standards for the purpose of small groups instruction in science. As this is a district wide initiative, the impact from this work will truly impact the entire district as the two focus on curriculum across Hillsborough School District.

Proposal 2 – Teaching Engineering Design
In this project Michele and Melissa are working with grades 2 and 3 teachers in 25 schools to help them implement engineering design in their classes. Michele is the lead. The goal is to identify barriers that prevent the teachers from implementing the curricular materials as designed, and to provide professional development activities to help the teachers overcome those barriers.

Progress and Highlights

Nicole Holman

Her team has developed five sequences for 5E instruction in biology. One has been implemented in Unit three on natural selection. They see this as a pilot in which the teachers become better acquainted with the 5E method and their team gets practice collecting data. They have developed and implemented a pretest and are collecting student work as they progress through the 5E sequence. They will be adjusting the design of the 5E sequences based on feedback from the teachers and data they are collecting from the students.

Michele Wiehagen and Melissa Triebwasser Project 1

They have begun to work with a select group of elementary teachers who are using small group instruction in their classes. As of our February 23rd meeting they had data from one teacher's implementation. They observed the class and provided feedback to the teacher. Their main concern at that point was what type of data to collect that would best provide them with formative information and eventually a summative report on the positive effects of well-structured small group instruction. At the February 23rd meeting they were given feedback about data collection and they will report back on what they have learned at our April 1st meeting.

Michele Wiehagen and Melissa Triebwasser Project 2

They have gathered data to identify the barriers to implementing engineering design in the grades 2 and 3 classrooms. The main barriers are teachers' lack of content knowledge, and their lack of understanding of what engineering design is and the purpose for teaching it. They reported this to the District professional development team, which offered the PD to teachers. Unfortunately, very few teachers attended this optional PD. Wiehagen and Triebwasser have shifted to a model in which they have identified a group of core teachers (1-2 per school) who their team will work closely with to help the teachers implement engineering design in their classrooms. These core teachers will then serve as ambassadors in their schools.

Plan for the Next Two Quarters

Date	People	Activity

March 22-25th	2 fellows, 2 DSC's, 1 leader	We will be attending NSTA in Atlanta. (Leader presenting)
March 27th	DSCs and Leadership	Monthly DSC and Leadership Meeting. We will finalize April meeting and discuss May / June meetings.
April 1st	All	We are having an in-person meeting on Saturday the 1st. Projects will continue to give updates on their progress. Phase 1 fellows will be invited to attend to hear what projects are like to help plan their applications.
April	Phase 1 fellows	We will hold a session to go over what Phase 2 entails for individuals interested in participating in second project.
May	Phase 1 fellows	We will hold a second session that will be late mid to late May to allow Phase 1 fellows time to work on their projects and develop specific questions they may want to ask.
May	Phase 2 fellows, DSCs, leadership	We will have a virtual May meeting to bring projects together to discuss their progress. We have been focusing on data collection.
June	All	This will be our end of year 1 event. We are researching where we want to have this project with, (Hillsborough school district like last year, or an Anchin Center conference). This will allow current projects to share their work thus far while allowing Phase 1 cohort fellows another chance to see what work is possible in the project.
June 15th	Phase 1 fellows	Phase 2 Cohort 2 Applications will be due.

Featured Fellows

Rather than providing a vignette of one fellow, our site has asked each project to present a description of their team and how they are working together. The first is from Nicole Holman's team. Because this week is Spring break in Hillsborough County, Nicole was not able to get a picture of her team.

The purpose of this vignette is to describe our collaborative project of curriculum development using the 5E method of storylines in biology. Our team consists of four science teachers, with the support of the department head, Jessica Novack who is a great leader and data analyst, and the biology PLC leader, Julie Nelson who has a strong background in science education. The team is also supported by a general science teacher, Zoe Haeck who has great ideas to bring to the table. The PI for the project is from the Tampa Bay Wipro Science Education Fellowship Program, Nicole Holman has had numerous trainings on pedagogical skills.

The aim of the project is to develop a new curriculum for biology that is engaging, interactive, and aligned with the 5E method of storylines. The 5E method involves five phases: engage, explore, explain, elaborate, and evaluate. Storylines provide a context for learning by connecting concepts to real-world phenomena.

The team is comprised of four science teachers with a range of expertise and strengths. The department head, Jessica, is a skilled leader who is adept at analyzing data and using it to drive decision-making. She is responsible for analyzing student data and identifying areas for improvement in the existing curriculum. The biology PLC leader, Julie, has a strong background in science education and brings a wealth of knowledge and experience to the project. She works closely with the other teachers to ensure that the new curriculum is aligned with best practices in science education. The general science teacher, Zoe, has a unique perspective and brings fresh ideas to the table. She contributes to the development of engaging lesson plans that capture students' attention and encourages them to explore concepts in depth. The PI from the Tampa Bay Wipro Science Education Fellowship Program, Nicole, provides guidance and support throughout the project. She has extensive experience in curriculum development and will ensure that the project is aligned with best practices in science education.

The collaborative project of curriculum development using the 5E method of storylines in biology is an exciting and innovative approach to science education. The team of science teachers, department head, and PI are well-equipped to undertake this project, bringing a range of expertise and strengths to the table. The resulting curriculum will be engaging, interactive, and aligned with best practices in science education. It has the potential to transform biology education and improve student learning outcomes.

MASSACHUSETTS- UNIVERSITY OF MASSACHUSETTS BOSTON

The Boston area partner sites are at the early stages of engaging in the Phase III program. The sites will be pursuing a mixture of district-wide initiatives and smaller projects. We are excited to help the sites begin this work as the begin to leverage the cadre of leaders they have developed in the earlier phases of the program.

Summary of Current Project(s) and Goals

Several projects are up and running in the Boston Public Schools. Teams have been established and funding put in place.

Arthur and Eric recently met with Cambridge science teachers. The Cambridge team has developed a proposal to roll-out vertical curriculum integration across the middle schools and high school beginning in the 2023-2024 school year, with the hope of adding elementary schools in the 2024-2025 school year.

Progress and Highlights

Boston projects are kicking off across the district. The teams are formed and beginning their work.

Cambridge proposal is progressing through final stages of internal review before being submitted for approval.

Plan for the Next Two Quarters

Date	People	Activity
April	All Sites	Information Sessions for Innovation Phase
May	All Sites	Applications for new projects
June	All Sites	New projects announced
June	All Sites	Project presentations at UMass Boston
September	All Sites	Kick-off event for new projects

Featured Fellows

Nicole Guttenberg, Ph. D. – District Science Coordinator – Boston Public Schools

Nicole Guttenberg is the preK-12 Program Director in the Science, Technology and Engineering department within the Boston Public Schools. She has been an educator for 26 years. She earned her BS in Biology at UMASS Amherst, a Doctorundus from the Vrije Universiteit in Amsterdam, the Netherlands, in Medical Biology, a MEd from UMASS Amherst, and a PhD in Curriculum in Instruction from Boston College. After spending a year as a substitute teacher, she went on to teach multiple levels of science at Central High School in Springfield, MA. She taught an instructional methods course to aspiring teachers at UMASS Amherst and Boston College and was the Project Director for a beginning urban teacher support program. She has been with Boston Public Schools since 2007, serving as a school leader, instructional coach, and now science program director.

Nicole found her place and passion in urban education supporting and coaching school leaders, colleagues and most importantly teachers to become teacher leaders so all students can achieve. Our students need to see the possibilities and potential of critical thinking and collaboration, to be challenged to push themselves and succeed in their learning, and above all see that there is power in learning from failure as that is what science and engineering is all about.

She strives to find ways to make supporting science teachers accessible for school leaders. She works to ensure teachers have spaces for learning and collaboration and believes strongly that the best people to provide learning for teachers are their colleagues. “If teachers have a safe space to express what they need, then we in the department can work to provide it. By putting structures and systems in place to develop teacher leaders, we can strengthen our professional learning community.”

Betsey Clifford, Ph. D. – District Science Coordinator – Braintree Public Schools

Betsey Clifford is the K-12 Director of Science for the Braintree Public Schools in Massachusetts. Betsey grew up on a family dairy farm in Buckland, Massachusetts and developed a passion for learning about science and the environment and teaching others. Betsey completed her undergraduate degrees at Massachusetts College of Liberal Arts (MCLA) in Elementary Education and Environmental Studies with a minor in Biology. She started teaching middle school science after graduating. Betsey completed her Masters of Education in the Educating for Sustainability program at Antioch University New England. She relocated to Braintree, Massachusetts and continued to teaching middle school

general science. Betsey then completed her PhD in Curriculum and Instruction through Capella University.

Throughout her teaching career she has been involved with the Massachusetts Association of Science Teachers (MAST) Board of Directors and served as the president at one point. Through MAST, Betsey helped organize and host an NSTA National Conference in Boston and was able to collaborate with other state leaders. Betsey is the coordinator for Science Matters in Massachusetts, a newsletter which goes out twice a month including upcoming opportunities for educators and students as well as resources.

In 2015, Betsey transitioned into the K-12 Director of Science position. As part of this role, Betsey became the DSC to support Wipro Fellows in the district. Cohort 2 was part way through the process and Cohort 3 was just beginning in Boston. Betsey collaborated with the other DSCs from the Boston site and supported the Braintree teachers throughout the program. Betsey continued with the Wipro Phase II grant to support vertical articulation work in the district as well as learning about the conceptual modeling pedagogy and how it can benefit students. The resources and community through Wipro has been an important part in Betsey's development as a new district leader and has supported growth in Braintree. The teacher leaders and vibrant members of our department and their individual schools and have continued to lead the way.

MISSOURI- UNIVERSITY OF MISSOURI

As we start our H-CCLS semester cohort 4 fellows are starting work on lesson plans that they will disseminate among their buildings and districts. The goal of the lesson plan is to integrate science and math so that students and teachers see them as complementary subjects. Fellows will use their chosen research articles to guide them. We have begun the process through collaboration among middle and high school math and science teachers, and plan to expand the process to elementary grades in participating districts. Thus we expect to broaden the integration of math and science across districts and across K-12 grades.

Summary of Current Project(s) and Goals

The current project is an expansion of the teacher network, providing opportunities for collaborations and leadership, and focusing on collaboration between science and math teachers in middle and high school. The project will address the challenges of teaching science and math in a harmonious manner at the middle and high school grade levels. Students often think of math as a set of rules used to manipulate abstract concepts. Several factors contribute to this thinking. For example, terminology used in math vs science, the sequencing of math units with relation to science, the infrequency of discussion about the relevance of specific math units on science topics, the differences in graphing methods used in math and science classes, and so on. The collaboration between math and science teachers is essential to the implementation of a successful science curriculum. This project will focus on the Science and Engineering Practices of Using Math and Computational Thinking.

The project recruits middle school math and science teachers in teams from previous and new school districts. A team can be either from a middle (6-8) or a high school (9-12) grade band. A team will consist of 2 to 4 teachers, with at least one science and one math teacher. Members of a given team will participate in the project in the same cohort. Fellows will work with the project for 2 years. Three cohorts of fellows are to be recruited in 2022, 2023 and 2024, with 15 fellows per cohort. Fellows will work in V-CCLS and H-CCLS teams in Year 1, and will develop one lesson plan that integrates math and science. In Year 2 they will work within their teams and develop 3-4 lesson plans or a module of lesson plans that they will disseminate to their and other school districts. Cohort 4 was recruited in fall 2022 and is engaged in the second semester of year 1 activities.

In Year 2, elementary teachers will be recruited from Year 1 fellows' districts as associate fellows. Elementary teachers typically teach both math and science. The purpose of having them work with middle and high school teachers is to have them learn content and methods so that they can integrate science into their math classes and vice versa. More details are presented in a later section.

Progress and Highlights

December meeting:

Fellows presented their V-CCLS work. Team 1's presented "Mayer's Problem-Solving Strategy – Using Visual Models to Persevere," and Team 2 presented "Modeling with Mathematics." Both teams had worked hard to make their presentations engaging and useful to the audience. Their examples and student work provided evidence of innovative ways in which their V-CCLS lessons integrated math and science.

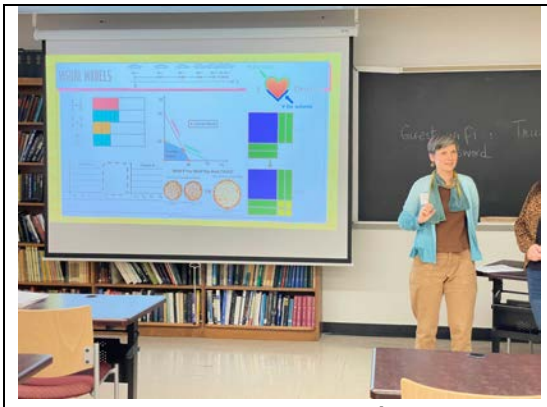


Figure 1. Team 1: Mayer's Strategy - Using Visual Models to Persevere

Figure 2. Karen King, Nicole Campbell, Melissa Hough, Melissa Hundley and Matt Wrightman presenting their V-CCLS work, Dec 15, 2022.

January meeting:

Since the original PI of this project, Dorina Kosztin, sadly passed away on Jan 5, 2023, we held a memorial for her that included a movie commemorating her and a short address by Meera Chandrasekhar, who has taken over as the PI. A new co-PI, Prof. Linda Godwin has been inducted into the project. Dr. Godwin received a Ph. D. in physics from the University of Missouri. She then worked at NASA for 30 years, where she was a payload officer from 1980-85 and an astronaut from 1985 to 2010. She is a veteran of four space missions. She returned to the University of Missouri as a Professor of Physics in 2011. Dr. Godwin is currently Professor of Physics Emerita. She was co-PI of the PhysTec project and is active in making presentations to the public about space science. We are excited to have her join the Wipro project.

H-CCLS teams began working on discussing a research paper during the January meeting. The 3 middle school teachers (from Columbia Public Schools) constituted one team. Three high school teams consist of two teachers each from Columbia, Boonville and Hallsville. Each HS team has chosen its own research paper. However, they will watch videos from

each other's districts so that each fellow watches 3 videos. The teams, their research articles and science and math practices chosen are listed in the table below.

Team & Fellows	Research Article	Science Practice	Math Practice
Middle School (Columbia): Susan Elliott, Nicole Campbell, Matt Wightman	Walter Aminger, Sarah Hough, Sarah A Roberts, Valerie Meier, Alexis D Spina, Hani Pajela, Mandy McLean & Julie A Bianchini, *Preservice Secondary Science Teachers' Implementation of an NGSS Practice: Using Mathematics and Computational Thinking,* Journal of Science Teacher Education September 2020	#6: Constructing Explanations & Designing Solutions	#3: Construct viable arguments and critique the reasoning of others
High School (Hallsville): Erin Snelling, Melissa Hough	Swanson, H. *Computational Thinking in the Science Classroom. International Conference on Computational Thinking Education* 2017, (). Retrieved from https://par.nsf.gov/biblio/10026244.	#5: Using Mathematics and Computational Thinking	#1: Make sense of problems and persevere in solving them
High School (Columbia): Karen King, Vera Reichlin	P. Karen Murphy, Jeffrey A. Greene, Elizabeth Allen, Sara Baszczewski, Amanda Swearingen, Liwei Wei, Ana M. Butler, *Fostering high school students' conceptual understanding and argumentation performance in science through Quality Talk discussions*" Science Education. 2018; 102: 1239–1264.	#3: Construct viable arguments and critique reasoning of others	#7: Engage in argument from evidence
High School (Boonville): Brea James, Melissa Hundley	Zheng, R., Cordner, H. & Spears, J., *The impact of annotation on concrete and abstract visual representations in science education: testing the expertise reversal effect*. RPTEL 17, 18 (2022). https://doi.org/10.1186/s41039-022-00194-y	#5: Using Mathematics & Computational Thinking	#2: Reason Abstractly & Quantitatively

February meeting:

Two teams, the middle school team and the high school Columbia team presented their research papers and received warm and cool feedback. Both teams presented their papers in a succinct and interesting fashion, and several fellows expressed their interest in the papers. The teams then spent about 40 minutes discussing outlines of how they would like their lesson plans to be structured. They reported back on their ideas, which led to teams "borrowing" ideas from others. The Boonville and Hallsville team decided to work together,

leading to three different templates. These preliminary templates are available at https://drive.google.com/drive/folders/1iH6Fe91ZpNFbxb8Q2Y_BiPhf9F9PIf9q?usp=share_link

Elementary Teacher Fellows:

The recommendation to include elementary teachers came in the review of our proposal in 2022. We plan to start involving them in Year 2, and are soliciting feedback from several sources in order to construct a structure for them. Based on feedback from cohort 4 fellows, district coordinators and from Mika Munakata, who has previously run a GK-12 program for math-science teacher collaboration, we plan the following:

- Recruit elementary teachers in teams of 2-4 teachers to collaborate with year 2 fellows in each cohort, and from districts represented in that cohort. In 2023-24, teachers will be recruited from Columbia, Hallsville and Boonville districts.
- Year 2 middle and high school teachers and elementary teachers will meet together 4 times during the academic year. 90 mins of the meeting time will be spent working together in their district teams (i.e., K-12 district teams), and 90 mins in their grade band-specific teams.
- Include a small stipend for elementary teachers (e.g., $300).
- Elementary teachers will have two tasks: (1) to work with middle and high school teachers on a vertical topic (2) to work within their elementary team on a math-science integrated lesson/activity.
- For task (1) above, each elementary teacher will create one lesson/activity over the academic year. In each elementary team, at least one teacher should focus on a science lesson and one on a math lesson. All teachers in an elementary team should teach all lessons in the process of finalizing them.
- For task (2) above, several ideas were suggested as the topics to consider for the collaboration among elementary, middle, and high school teachers. During the August meeting we plan to have all teachers discuss these topics, and have each district choose one to three topics on which they will focus their efforts during 2023-24. Here were the topics suggested:
    - Vertical alignment of math topics and simultaneous inclusion of science. This includes identifying content in elementary grades that is foundational to middle and high school; how standards propagate through the K-12 spectrum (e.g., the concept of a function, ratios, numbers, operation, fraction manipulation).
    - Pedagogical structures frequently used in elementary school that might be of value in middle and high school (e.g., differentiation).
    - Since science is not usually taught daily in elementary school, while math is, ways to integrate science activities into math so that students learn some science every day.
    - Use/disseminate mentoring model from Boonville GPS projects: have HS students create and teach occasional science/math/integrated classes to elementary students (with teacher supervision)
    - Discuss the use of 5E in math.

- Presentations of modules/lessons by middle and high school teachers on what they have learned over the previous year.
- Consider or try out integrated math-science class in elementary grades rather than separate math and science classes.
- Find ways to include quantitative learning in science classes (e.g., use math processes such as Venn diagrams)

Recruitment of Cohort 5:

We have begun recruitment of cohort 5 fellows. A brochure has been posted on the website and sent out to current and former district coordinators. We are currently working on an expanded list to contact new districts.

Plan for Next Two Quarters

Date	People	Activity
April meeting	Fellows, DCs (optional), MU staff	Research presentations by Boonville and Hallsville High School teams. Continued discussion of structure of lesson plans Discussion of May H-CCLS presentations
May conference (1/2 day)	Fellows, DCs, MU staff, visitors	H-CCLS presentations
Apr-June	DCs, MU Wipro staff	Cohort 5 and Elementary cohort recruitment
Two August meetings	Fellows, DCs, MU staff	Beginning of year meeting for Cohort 5 (9-4 pm) Beginning of year meeting for Cohort 4 and Elementary cohort (9-2 pm)

Featured Fellows

Brea James, Boonville High School, Boonville R-I school district

Figure 3. Students at Boonville High School making s'mores after an introductory stoichiometry activity

I teach high school Physical Science, Chemistry and Physics. My Physical Science classes are primarily for freshmen. In Chemistry I teach a mixture of juniors and seniors. My Physics class is all senior students. This year, in Physics, we are beginning the transition from a traditional high school physics class to an AP Physics 1 class. I applied the work I am doing in the Wipro project to this class. During my VCCLS work in the fall semester, my group focused on mathematical modeling in the classroom. The research article we used described modeling as beginning with a real-world problem and solving it using a student-created model and making adjustments as needed. At the beginning of the year, my Physics students required a more teacher-facilitated model. As the year progressed the students became more autonomous. Next week, the students will be performing a culminating project within our conservation of energy project. Hopefully, this will be their opportunity to show their ability to perform a large-scale modeling project with little teacher facilitation. Wipro has given me the confidence to try new methods in my classroom. More importantly, it has given me a network of peers to collaborate with to create and implement new lessons.

Matt Wightman, Smithton Middle School, Columbia Public Schools

Figure 4. Matt Wightman, Smithton Middle School, Columbia Public Schools

I currently teach 7th grade science at Smithton Middle School. Here, our 7th grade year includes one semester of physical science and one semester of earth science. Our primary units during the year include an introduction to chemistry, the electromagnetic spectrum and other waves, weather, and climate change. In the fall semester, I used my Wipro research article to help me teach the concepts of density in our chemistry unit. I integrated valuable modeling techniques to facilitate the teaching of density both conceptually, as well as mathematically. This semester, I am focusing on incorporating mathematical cognitive thinking at a high student level in regard to analyzing collected data and representing relationships between variables as students conduct experiments. Students are measuring decibels and problem solving how to minimize the escaping volume (from sound waves) coming from their created cardboard box models of a "garage band practice space."

NEW JERSEY MONTCLAIR STATE UNIVERSITY

Since the last quarterly report, the New Jersey team has progressed steadily towards the Fellows addressing their district initiatives. The entire group of Alumni and New Fellows came together on Thursday, March 2, 2023 to engage in reflection and goal-setting. Each team met with their faculty mentor and discussed the objectives of their projects, created a timeline to achieve those goals, and designated what would be appropriate data to collect. They met with doctoral assistants to clarify aspects of their network analysis maps and provide more details about how they are using their networks. Additionally, team members wrote vignettes to reflect on what they had accomplished so far. The teams also began planning their end-of-year presentations, which will occur at the culminating event on May 2, 2023.

Summary of Current Project(s) and Goals

The Wipro SEF project at Montclair State University is entering the second half of Year 1 of the program. Below is a report on the progress towards the two project goals.

- Recruit 2 cohorts of Wipro SEF Fellows over four years. Each cohort will participate for 2 years and will include 15 Wipro SEF alumni and 15 new Wipro SEF Fellows.
    - Recruitment for Year 1 was successfully completed over Summer 2022.
    - Year 1 involves a total of 13 alumni Fellows who have each recruited a group of new Fellows.
    - 18 new Fellows have been recruited by the Alumni Fellows. The new Fellows attended the second meeting of the year on November 17 with their "mentor" Fellows. The new fellows are from 4 of our 5 original districts plus three additional districts: Bloomfield, Hawthorne, and Teaneck.
- Supporting the alumni Fellows to undertake their projects
    - Each MSU faculty mentor has met with both the Alumni and new Fellows.
    - Alumni Fellows submitted their quarterly reports on November 5th, 2022. Each has received written feedback from their MSU mentors.
- Conduct research on project
    - The MSU research team consists of the three project directors and two Teaching and Teaching Education (TETD) PhD students and two mathematics education PhD students.
    - The research group is using social network theory to guide the work on the collaborative networks of the Fellows and to inform the research on the project. The research entails using social network theory to describe changes to each Fellow's social capital throughout their projects.

Progress and Highlights

All projects are progressing toward their goals for the May presentations. Details are summarized above.

Plan for the Next Two Quarters

Date	People	Activity
May 2, 2023	All Fellows + District administrators	Year 1 culminating event. This will be a celebration as well as a showcase of Year 1 work by the Fellow teams.

Featured Fellows

Montclair Team

Delia Maloy (center), with her team from Montclair.

Delia Maloy Furer, Glenfield Middle School / Montclair

25 years in education, Middle school science

Science education is a joyful process. The ability to observe middle school students as they engage in the process of inquiry and discovery brings me back to my own journey as a science learner. I find something I did not realize I lost on an almost daily basis.

Today I worked with a new science teacher in my department to conduct a portion of a lab. My colleague is well educated, personable, and eager to develop as a science educator. He walked into his current position having no experience. He restricted his instructional practice to lectures and heavily guided activities for the first half of his first year. That was his *remembered* experience as a science student.

We developed a lab based on the concept of conservation of mass. We designed an implementation schedule where I conduct a portion of the lab during the last period of the school day, co-teach the same lesson during the first period of the following day, then leave to teach my own classes as he runs the lesson with his remaining classes. Today, as I watched my new colleague conduct a demonstration of a phenomenon related to the lab, I realized that he was in the process of recollection. Following the lesson, he spoke to me, joyfully, about labs he remembered after running his own.

Educational leadership can be about maintaining standards, collecting data, or any other action that occurs in school offices. We all need to be able to function as a part of the mechanism that keeps us employed and keeps our school functioning. For me, this is not where leadership lies. For me, it lies in the persistence of joy we impart to our colleagues.

Hawthorne School District Team (a new district among us):

The Hawthorne Team

Kristen Trabona, Hawthorne Public Schools

21 years in Education (Teacher, Supervisor, Principal, Director)

Biology, Chemistry and Science Electives

When I circled back to the WIPRO program this year, I found myself back at the heart of what I love; teaching and learning. I have been working with new fellows on critiquing their work around phenomena-based instruction. This has forced me to be reflective in my own practice and step back into the role of today's teacher. A different lens was needed after 12 years in administration. I felt the need to immerse in today's classroom. Through informal visits and observations, I reacquainted myself with today's students. It took time (months) for me to get on the same page and be ready to help lead the teachers with whom I was working. The trust has

been mutually re-established so there is not a barrier or divide of administrator and teacher. The work now is progressing beautifully.

James Hurley, Hawthorne High School, Hawthorne NJ

8 years of teaching

Chemistry, Physics, & Anatomy & Physiology

This year I have been trying to focus more on adding phenomena to drive my lessons forward. I can think of a very simple lesson that I did that perfectly covered and achieved this goal. I was trying to convey that temperature is actually a measure of movement instead of heat. I had students place food coloring in a hot water bath, room temperature water bath, and in an ice-cold water bath. Through this work, the students were able to discover the answer all by themselves.

Julia Abahazy, Hawthorne High School, Hawthorne, NJ

2 years of teaching

Physics

To become a better leader as a teacher I am collaborating with other teachers within my department as well as teachers at the middle school. I am experimenting with phenomena-based instruction that encourages students to lead their own learning. We are planning on presenting new strategies/techniques and reflections of this process at department meetings to cultivate “buy in” from other teachers. By collaborating with other teachers, I am influencing and being influenced at the same time—changing the culture within the district I work. I am learning how other teachers in my community have the same goals as me and new strategies to achieve these goals.

All Wipro Reimagined Fellows (the GNY name for this new phase) are hard at work getting their projects off the ground. In January, the groups came together for a whole group virtual meeting to discuss their progress and set goals for the rest of the year and beyond. Administrators from New Rochelle attended this meeting to support three out of the six groups. This buy-in from district administration demonstrates that they are willing to support district change led by their teachers. All six groups of teachers separately met with Kristen Napolitano to provide updates on their projects. Throughout February, teachers got their materials (coordinated by Mercy College's Center for STEM Education) and began their work integrating STEM curriculum, planning outdoor learning activities, setting up indoor gardens, planning for family science evenings, or establishing a teacher resource hub.

Summary of Current Project(s) and Goals

The Mercy College Greater New York (GNY) Wipro Science Education Fellowship, in partnership with University of Massachusetts at Boston and other colleges, as funded generously through the Wipro Corporation, has been highly successful in supporting teacher leadership and science teaching in Westchester and Rockland counties in New York.

The Mercy College Center for STEM Education, GNY's leadership site, was able to leverage their contacts and esteem from their prior work with Wipro and NSF programming, as well as their external funding streams, to serve the community through programs for children, families, and teachers. This includes supporting a new branch of Wipro, that MCCSE calls, "Wipro Reimagined." This innovation phase of Wipro involves teacher led, collaborative projects that are designed to enact district change. These projects, created by Wipro Fellows and newly participating teachers, receive buy-in from administrators as associate group members, as well as in-district support from DSCs. Over the course of 4 years, MCCSE aims to establish a norm of collaborative action towards district change in the five existing Wipro districts. Example Wipro Reimagined projects include designing STEM instructional materials and resources for elementary school teachers, creating outdoor learning units focused on increasing student access and participation in community green spaces, and providing professional development to teachers on integrating engineering into their STEM curriculum.

With their eyes set on sustainable change, MCCSE plans to equip participating teachers with the tools and practices necessary to carry on transformative efforts even when Wipro

funding is gone. Furthermore, administrator buy-in is a prerequisite of funding. This project will require steps at each level of the district to ensure sustainability.

Progress and Highlights

In this quarter, the MCCSE team met with all the Wipro Reimagined groups to provide support and guidance. In the whole group meeting in January, Amanda Gunning ran a goal-setting workshop to get teachers thinking about district change beyond the scope of Wipro funding. In late January, Kristen Napolitano and Amanda Gunning visited Jefferson Elementary School in New Rochelle to attend the district social hosted by District Coordinator, Aimee Artis. This was attended by original Fellows and newly participating teachers (roughly 10 people total) and administrators (principal and vice principal at Jefferson). In February, all groups provided MCCSE with reports on their progress towards their project goals. As the MCCSE looks ahead, they are planning for the May 23rd group meeting and the October 14th K-12 STEM Teacher Conference.

Original Fellows join the newly participating Wipro Reimagined Fellows from Jefferson and Trinity Elementary Schools.

The meeting was attended by Original Fellows, Wipro Reimagined Fellows, and administrators.

Plan for Next Two Quarters

Date	People	Activity
3/6 – 3/7	Whole team	AE and AG will join MCCSE to visit all three Wipro Reimagined districts to talk with teacher teams and administrators. The leadership team will have the chance to meet five out of the six groups and all nine administrators. This will be particularly helpful in solidifying relationships with administration.
3/15 – 5/15	KN	KN will visit each team (in-person or virtually, depending on mutual convenience) to provide guidance and support on their projects. KN has asked each team to invite her to any in-person events that they host during this time.
5/23	Whole team	The final whole group meeting for the 2022-23 AY will be held virtually on 5/23 at 7 pm. This time will be devoted to celebrating the accomplishments of each group and prepping them for their upcoming presentations in October.
6/1	KN	Mentorship and final site visits
9/1-10/1	Whole team	Recruitment of new participant teachers and original Fellows to join the Wipro Reimagined session at the annual MCCSE K-12 STEM Teacher Conference which will have a Wipro strand including Wipro Reimagined poster presentations, workshops, and a brainstorming session

10/14	Whole team	MCCSE K-12 STEM Teacher Conference

Featured Fellows

This quarter, MCCSE chose to highlight the Trinity Elementary School team (New Rochelle) and Edison Elementary team from Port Chester (there are two groups at Edison, this team's project is called "Eggceptional Bridges").

Trinity Elementary School team – New Rochelle

(Ali Abramo, Maria Torres, Melody Castiglia, Jill Ritacco, Johanna Vasquez, Ann Marie Manganiello)

This quarter the **Trinity Elementary School team** was able to integrate ELA and the Engineering Design Process to 2nd and 3rd graders. They started this by introducing students to "what is a scientist and what are engineers" through various activities including ecosystem engineering. Students learned about beavers and integrated science and engineering to build beaver dams. They also integrated engineering and robotics to their geometry math unit and are currently building a 3D city and learning about civil engineers. They reported, "We were surprised about the high interest of the students. Independently, they want to do research on how they can become experts about these topics."

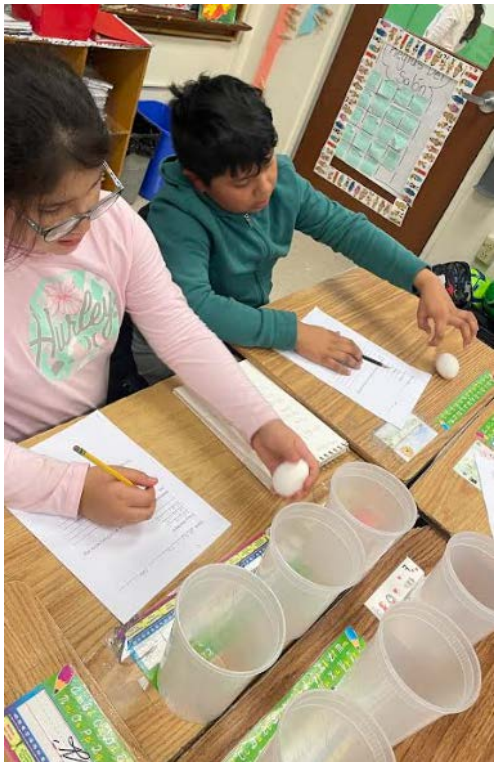
Students at Trinity Elementary School in New Rochelle, NY participating in integrated engineering and science activities.

The group plans to continue promoting question asking skills using sentence starters. They also hope to navigate the pressures to keep up with ELA & Math scope and sequence. In May/June we they plan to display their finished products/bridges and will continue to do learning walks through each other's classrooms.

Edison Elementary School team "Eggceptional Bridges" – Port Chester

(Carrie Poulos, Colleen Cahill, Georgina Diaz-Luz)

The Eggceptional Bridges group at Edison Elementary School in Port Chester are working on having their students study materials engineering. They are doing this by having students conduct experiments on different materials and testing their durability and other characteristics under varying conditions. So far, they have done two out of five integrated STEM lessons with their students.



Students conducting an initial investigation, taking notes, and making predictions at Thomas Edison School in Port Chester, NY.

During these sessions, they worked on problem solving skills with their students as they tested how different substances interacted with eggshells. These lessons are part of a series meant to bring more STEM into their existing curriculum. As they look ahead, this Port Chester team is trying to figure out how to get their grade level colleagues to participate in this initiative to incorporate more STEM into the curriculum.

The Texas site is in Phase 3, the Innovation Phase, Year 1. Fourteen (14) projects have been approved and are in progress. Of these 14, 9 are school projects, 2 collaborative interschool/ district projects and 3 individual projects. Of the participants involved in Phase 3, year 1, there are 11 alums and 22 new fellows. Alums having been through the traditional 2-year Wipro SEF program have a much stronger awareness of themselves as teacher leaders and their own impact on their peers, students, school and ISD. This is not wholly true for some of the newer fellows. As hardworking and versatile as they are, their journey as teacher leaders transforming their districts has just commenced. The struggle is real for them--to see themselves as transformational leaders with the ability to impact a school and a district!

Learning to transform is supported on the postulate that people have the power to change themselves and to change things. However, the process of achieving this change needs a transformational agent/leader (the teacher) in an environment receptive and conducive to implementing this change (the school and then the district). The group is doing well, having the principals involved also helps. All projects are going well, and what is learned from experiences this year will surely impact what is done and how it is done next year!

Summary of Current Project(s) and Goals

Phase 3, Year 1 School Projects
NSEC Enrichment for middle school: Grand Prairie ISD. Collaboration between teachers at the Young Woman's Leadership Academy and the GPISD Natural Science Education Center (NSEC). The team will work together to build four interactive, culturally relevant, hands-on activities that will reinforce frequently assessed TEKS clusters. Middle school students from GPISD will have an opportunity to visit the NSEC as part of their pre-STAAR summit review program. Providing a unique hands-on learning review outside of the school will allow the students a deeper understanding of these TEKS.
5th Grade Science Teacher PLC: Lancaster ISD This collaborative project led by the Lancaster ISD DSC focuses on developing a Professional Learning Community (PLC among 5th grade science teachers from Lancaster ISD). The PLC process is intended to create the conditions (improve their own content knowledge and pedagogical content knowledge) that help educators become more skillful in facilitating student learning of science to a greater degree.
Effects of Collins Writing in 8th grade Science : Cedar Hill ISD Collins writing is a district initiative put in place by the district to increase writing and reading comprehension. Goal for this project is to improve 8th grade Science STAAR scores across Cedar Hill Independent School District. Their science STAAR scores have decreased 24% since COVID hit. Additionally, the 8th grade STAAR test format is changing from all multiple choice to a mix with some constructed

response questions. It is it is imperative that the students have opportunities to write in science and this project will provide data on the students' ability to write and how to better help our students write in science.

STEMing to STAAR: Irving ISD

Irving ISD in a new district initiative has created several STEM lessons for their teachers to teach. This collaborative project aims to determine how these lessons are being delivered and the efficacy of these STEM lessons. Participants are 5th grade science teachers in 2 test schools. Some of the questions they want to examine are: What are some barriers teachers might face when implementing these lessons and how can we remove them? What improvements can be made in order to more align these lessons with STEM practices while still maintaining a STAAR lens in a manner that is still practical for title 1 teachers?

Preparing students for STAAR 2.0: DeSoto ISD

Looking at Common Assessment and Snapshot data, DeSoto ISD is currently seeing that their students are not prepared for the new redesign of the upcoming STAAR (5th grade) test. The STAAR test is no longer only multiple choice but requires students to critically think by answering questions that are short constructed responses, drag and drop, or multi- part. Data shows that students are significantly (15%) not successful on the new STAAR item type questions. We would like to increase students' engagement by creating interactive activities that align with the new STAAR redesign. We would do this by creating interactive classroom activities that model the STAAR new item types, such as drag and drop and hotspot questions.

GFAA ST*Arts* Club! : Grand Prairie ISD

The purpose of the project is to host an after-school arts integrated science club with focused activities relating to force and motion to give elementary students in need of a positive connection with academia, multiple hands-on, fun experiences. It is our goal to build a love for science in students that currently are struggling with the idea of energy, force and motion, and circuits.

Which Properties Matter? :Grand Prairie ISD

Bilingual science educators at GPISD will give students in grades 2 & 3 continuous opportunities to explore the properties of matter through the engineering and investigative design process. Dual language students will work through a series of investigative stations during their Spanish -Science class block to gain a strong foundation of the properties of matter so that they are able to then apply what they have learned about the properties of matter in order to create and engineer a product or invention that will be useful to everyday life.

Edible gardening: Grand Prairie ISD

The purpose of the project is to investigate the impact of an edible garden and quirkles on science vocabulary acquisition of our elementary students. "Quirkles" are a science literature alphabet caricature vocabulary story set (https://www.quirkles.com/). Teachers will use age-appropriate stories from the Quirkles books. Students can then go into the Outdoor Habitat , where our edible

garden will be installed, and see many examples of different types of plants , edible and non-edible.

STEMtastic Mornings: Grand Prairie ISD

This collaboration provides students who arrive at school early in the mornings the opportunity to engage in a variety of STEM activities that otherwise they would not have access to at home or during the regular school day. We are going to build an array of STEM stations in the school that will be accessible to all students. We will incorporate a new WALKSTEM station with our natural ecosystem in our school field that the fire department burns annually. We will create a lego wall as well along with small technology stations that will ensure student success as they learn how to problem solve and build their critical thinking skills in a fun and engaging environment.

Collaborative projects (Inter district)

All Hands 0n Deck: The Impact of Hands-on Activities on Science Instruction

Educators from Advantage Academy and Lancaster ISD will collaborate to provide equitable outcomes for all students that will allow them to develop a deeper understanding of science through hands-on activities. This will be done by planning, collaborating, instructing, using intentional strategies to support ESL students, and providing hands-on activities to increase Science awareness amongst 5th Grade students at both Advantage Academy and Lancaster ISD. We will collaborate horizontally with three major Science themes as our focus that will allow students an opportunity to have hands-on experiences. In addition to that, we will use instructional strategies that support our ESL students by developing their language needs through the use of content vocabulary

Exploring Science Concepts Using Social Studies in A Cross Curriculum Research Study

The collaboration between a science teacher from Irving ISD and a social studies teacher from Lancaster ISD is designed to explore a cross curricular experiment between social studies and science to better understand how the two disciplines can benefit students in a one lesson delivery. The social studies and science students will film an explanation of the same topic. Social Studies will explain the historical and social aspects of a topic and science will explain the scientific aspects of the same topic in film. When the film is complete, both clips will be edited and combined to present one lesson so students can see the connections between both subjects. The students will watch the films in their own classrooms and give their assessments of the connections that they are able to make in their journals.

Individual Projects

Science STAAR Bootcamp 2.0: Lancaster ISD

The purpose of this project is to provide a STAAR Bootcamp 2.0 that will increase 5th grade students' science content knowledge so they will do better in the science STAAR in May 2023. The bootcamp will align to the district framework and pacing calendar. It will be composed of two components; 1) Targeted in class

interventions, in which teachers will address individual student needs through small group instruction, 2) Enrichment sessions, after school "club" focused on accelerating student learning through hands-on investigations and learning games.
Classroom Educational Website for Science Content: Denton ISD The project investigates the at-home use of an educational website that is designed to be used by their school-aged children to supplement our science class instruction. The website will have notes, PowerPoints, videos, interactive activities, other websites, and many other tools to help students succeed in their science classes. This website will be used outside of school hours and will be available to the students and parents. The student has access to the website through Google Classroom and the web address will be emailed to the parents as well. Trends in the progress of the science content taught to the students who use the website and those who do not, will be tracked.
I CER You: Duncanville ISD Claim, Evidence, and Reasoning (CER) is a pedagogical framework that is most often used in science classes, for students to write scientific explanations. The framework is cross-curricular and can also be used in daily life when communicating with others. The CER pedagogical framework will be used with students who are Collegiate Academy Honors Biology scholars. There are prompts, and students are given sentence starters to help assist in writing their responses to the prompts. It is free writing, but it is structured, including the framework, based upon their thinking in response to the prompt.

Progress and Highlights

1. **With respect to the existing Phase 3 , year 1 projects:**

Part of the requirements of the grant at UNT Dallas is for project participants to fill in a quarterly report to inform the PI both individually and collaboratively how they are progressing with the project, including any challenges they might face while doing the project, what they need from PI. Pictures of their projects are also included. This site has 14 projects ongoing, here is quarterly report link:
https://docs.google.com/document/d/13iyA82LTOGbpbgfHZl-fsoKt22xUZ4lg_48Y8Duccu0/edit?usp=sharing
Satisfactory progress is being made with the progress being made. A couple challenges raised to the PI from the projects were things that could not be controlled such as inclement weather and scheduling conflicts. Two groups mentioned starting the project a little earlier in the year, and that ideas is currently under consideration by the PI.

2. **Teacher of the year awards**

Jennifer Melton from Florence Hill Elementary school, Grand Prairie ISD was awarded Teacher of the year at her school 2022-23 and is in the running for District teacher of the year. She is a new fellow and is currently working on the School Project titled Edible Gardening.

This was her response to a question asked in her application for GPISD District Teacher of the Year
Response Question 2
Describe a project or initiative you have been involved in which contributed to the improvement of overall school culture. What was your role, how did you collaborate with others, and what is the status of this project today? Please include evidence of student impact. (500 words maximum)

At Florence Hill Elementary, I have had the opportunity to play a significant role in a project that has helped improve the overall school culture. Specifically, I have been working with the Green and Clean Team, a group of students who are passionate about promoting a healthier earth.

As part of the Wipro Science Education Fellowship, my colleagues and I collaborated to write a grant that would enable us to create an edible garden and utilize the Quirkles curriculum to increase science vocabulary acquisition among our students. My responsibilities in this project included leading the writing of the grant, submitting reflections, writing assessments, analyzing data, and keeping our website up to date with measurable data. As a result of our initiative, 75% of our students involved improved their scores on the rubric for science vocabulary acquisition.

To improve the organization of the Green and Clean Team and empower our students, we created four different divisions: leadership, newsletter/hydroponics, gardening, and litter patrol. Our team of teachers lead these different divisions, and I facilitate the students working on the newsletters and hydroponics. This has allowed students to develop a range of skills, including troubleshooting mechanical problems with the hydroponics, writing articles for The Green Pages, and incorporating the Quirkles curriculum into the articles to educate their peers.

Our Green and Clean Team has almost doubled in size this year, with more than 60 students involved and seven teachers. The team has also had the opportunity to work on several collaborative technology projects with me, including a time-lapse video showcasing an alternative energy project and a newscast created using a green screen. We even won a day of MCREW with our time-lapse video, a mobile CREW Camp that brings landfill conservation, recycling, energy, and wetlands education stations to our campus from the Keep Grand Prairie Beautiful Coordinator.

As part of our Wipro grant proposal, we worked with local community members to install an edible garden in the school's outdoor learning center. This garden has been an incredible opportunity for students to learn about plants, gardening, and nutrition, as well as develop important skills such as teamwork and responsibility.

Overall, this initiative has made a significant impact on the overall school culture at Florence Hill Elementary. By empowering our students to take an active role in promoting a healthier earth and deepening their understanding of science and vocabulary, we have

created a positive, safe, and secure environment that empowers students to learn, build self-esteem, and advocate for their beliefs. Our Green and Clean Team continues to grow and thrive, and we are excited to see what the future holds for this project. The measurable data we have collected has shown the significant impact of this initiative on student learning and engagement, and we are committed to reflecting on our practices to refine and improve our approach in the years to come.

Maria Louisa Soto was also awarded Teacher of the year at her school, Speer Elementary, Arlington ISD.
Maria is a C1 fellow and was originally with Irving ISD, she moved to AISD and has still continued to work on collaborative projects with Irving ISD fellows during Wipro Phase 2. I have written her a letter supporting her application for District teacher of the year, AISD.

3. **Wipro Site visit to Dallas**

The site visit was eagerly awaited, the DSCs worked well together to organize several school visits with Principals from our 5 participating districts. Some of the fellows wondered why their schools were not visited. Everyone is looking forward to reading the report on the Dallas site visit, everyone is curious. Personally, I look at the site visit and the feedback we will get as a positive, an opportunity to learn and grow. We can very rapidly pivot and fix anything we need to for the subsequent years of the Phase 3 Grant.

4. **Upcoming meetings**

a. **Zoom meeting with the DSCs March 20th, 2023**

This is an important meeting because we will decide as a group what the final product for each project will be that needs to be uploaded to their website. They will be presenting a poster, so it might be a paper or might be a video of the poster with voiceover explaining each section.

b. **Wipro Meeting on March 27th, 2023**

This is a dinner meeting that will be held at UNT Dallas and only the fellows are invited and the DSCS. I intend to use this meeting for several things

i) The UNT Dallas Provost Dr. Betty Stewart will be presenting to the Wipro Fellows about teacher leadership in an interactive 45-minute session.
ii) One of the requirements of the grant is for all fellows involved in a Wipro project to submit a proposal to the Conference for the Advancement of Science Teaching (CAST, Nov 2023 in Houston). While I cannot guarantee their proposal gets accepted, we will submit them. I have invited President elect Kenric Davies to attend the meeting and talk to the Fellows, I have yet to hear from him. I will provide the template for the CAST proposals and the due date and talk to the fellows about what and how to submit for CAST 2023.
iii) UNT Dallas is small and growing and the lack of rooms available is a problem, so I have to adapt. I will have the projects present to each other informally at their table and move to other tables when they are done. I will provide a structure for the presentations and prompts and a time frame.
iv) Expectations and timeline for the website and Poster presentation on May 26th, 2023. Each project has a website, and I will be talking to them as to what needs to go on the website and when. I like the idea of each new fellow actually crafting out an individual Teacher Leadership statement like in the Wipro SEF GPS. Also, regarding the poster session on May 26th, we will use the template for the posters we used in prior years and share expectations regarding the due date.
v) Several schools were visited during the site visit, I will ask attendees to describe their experiences of the site visit for the others and what they learned from it.
vi) We will celebrate the teachers awarded 'Teacher of the Year' at their schools and any other awards the fellows might have received during 2022-23

c. Annual Wipro dinner and meeting May 26th, 2023

This will be a big event. All the Fellows, Principals, admins from the Univ, Dr. Eisenkraft will attend. The 14 projects will be presented at the poster session, 7 in the first part and 7 in the next, with lots of appetizers, and dinner will be buffet style. Thinking tentatively of a Panel of the principals of the schools involved in the school project (tentative).

Where we go from here :

This will depend on the feedback we get from Dr. Eisenkraft. I am thinking of hosting a dinner for the C1, 2 and 3 Fellows just as a way to touch base with them and find out what they have been up to and they can also be updated on our progress. I am also thinking of hosting meetings, zoom, in person with the principals of our partnering districts to talk to them about the upcoming year, the idea needs to be flushed out a little more. One thing I am trying to do is to involve the informal science educators once again with Wipro projects. I am, We are, a work in progress!

Plan for Next Two Quarters

Date	People	Activity
March 20, 2023	DSCs	Zoom Meeting to decide on final product for each project
March 27, 2023	UNT D Provost, CAST President, & Wipro Fellows	In-person meeting to include leadership training, CAST Proposal submission preparations, expectations for May 26th meeting and review of the Wipro site visit.
May 26, 2023	Wipro Fellows, School Administrators, DSCs and Dr. Eisenkraft	Annual Wipro Dinner is the largest event of the year to include presentations from all 14 projects, dinner and recognition of school administrators. Panel presentation from school principals is also possible.

Featured Fellows

Tamesha Brown

The work that I have done with the WIPRO Science Fellowship over the past four years has impacted my career as a teacher leader and a campus leader. During the first year of the fellowship, I was offered a position that allowed me to support our entire campus as the Advanced Academics Specialist. I completed my Principal Certification in March of 2021. During the 2021-2022 school year, I was afforded the opportunity to serve as the ELAR Coach. The fellowship has allowed me to partner, collaborate and network with many great people. I am looking to build even more relationships in the future. The confidence that I have gained and the leadership qualities help to keep me resilient, relevant, and resourceful. I am truly looking forward to becoming the next Assistant Principal at an amazing school next school year.

WIPRO has also created a platform for my work to be shared amongst teachers, districts, and universities with the various conferences that our fellowship has hosted, participated

in and facilitated. Wipro has taught me how to leverage my leadership in order to impact teachers, students, and the campus as a whole.

I will be forever grateful for my time and partnership with the WIPRO Science Fellowship. I have evolved in my leadership practices. At this time, I serve my campus Advantage Academy, as the ESL Facilitator. I am looking forward to continuously growing in my leadership capacity. Going forward I will leverage my leadership to impact student achievement by supporting the teachers and encouraging high quality instruction.

Tamara Majors

Tamara Majors is the Elementary Math and Science Facilitator in Grand Prairie ISD where she is responsible for the alignment, coordination, and supervision of elementary mathematics and science instruction.
Tamara collaborates with principals in the development of campus and district-wide goals for the improvement of outcomes in the teaching and learning of mathematics and science, including assessments, research of high quality instructional materials, research-based instructional practices, professional development of teachers, supervision of campus instructional coaches, and leadership of innovative school programs such as Wipro, Math Innovation Zone, high impact tutoring, and additional days school year, Tamara has been a kindergarten through third grade teacher, teacher leader, and instructional coach. Helping the lightbulb come on for students and for their teachers provides her with great satisfaction. She is grateful for the opportunity to prepare students for the rigorous mathematics and science that they will experience during their secondary education.
Tamara serves on the board of directors of Texas Science Education of Leadership Association and has presented at CAMT, CAST and Wipro's own Southwest Collaborative Conference.
A proud graduate of Texas A&M and Lamar Universities, Tamara is currently a doctoral student in Texas A&M University's College of Teaching, Learning, and Culture where her research interests are problem solving in mathematics and teacher retention in hard to staff schools.

Activities this Month

- Administered mid-year survey to all active Fellows at all sites. Survey hard closes January 31, 2023.
- Continued communication with Arthur and Brooke about the research proposal. Meeting with Brooke to discuss data access and IRB on February 2, 2023.
- Met with Arthur to discuss objectives and strategy for 2023 site visits. Decided to focus on NY and TX this year.
- Met with Arthur and team leads from NY and TX to begin planning for 2023 site visits.
- Attended team leadership meeting on January 18, 2023.

What's Next?

During

the month of February, AGC will be working on the following:

- Performing initial analysis and preparing brief report on mid-year survey. (Report anticipated near end of February.)
- Preparing evaluation instruments for DSC Leadership meeting(s) in March 2023.
- Preparing for site visits to TX and NY in February/March 2023.
- Beginning any work needed by Brooke/team for research project.
- Participating in any scheduled/needed meetings for the project and/or research.

Wipro Science Education Fellowship Evaluation Update January 2023

Wipro SEF | Monthly Evaluation Update | January 2023 Anne Gurnee Consulting, LLC | Portland, OR

Activities this Month

- Made travel arrangements for site visits to Texas (February 27/28) and New York (March 6/7).
- Began work with Brooke Whitworth on collecting needed data and previous evaluation instruments for the Clemson University research work.
- Analyzed data from mid-year survey and began work on brief mid-year report.
- Reviewed team leadership meeting minutes from February 21, 2023.
- Conducted site visit to Texas with Arthur on February 27 & 28. Visited 7 schools on February 27 and 4 on February 28. Also met with UNT Dallas president, UNT Dallas Director of Integrated Communications, and the Dean of the School of Education.

What's Next?

During the month of March, AGC will be working on the following:

• Completing a brief mid-year report with results from the mid-year survey. (Report anticipated by March 10 at the latest.)

• Preparing evaluation instruments for DSC Leadership meeting(s) in March 2023. • Preparing for and completing the site visit to New York (March 6/7).
• Continuing to work with Brooke/team for research project.
• Drafting spring evaluation instruments (year-end surveys, interviews).

• Participating in any scheduled/needed meetings for the project and/or research.

Wipro Science Education Fellowship Evaluation Update February 2023

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