MHCRC TechSmart Initiative for Student Success
Centennial School District Project Plan:
Math and Science Integrated Project-Based Learning

I. PROJECT PURPOSE

About Centennial School District

Centennial School District (CSD) is a mid-sized district in east Multnomah county, with about 6,400 students and 350 teachers in seven elementary schools (grades K-6), one middle school grades 7-8), one comprehensive high school, and one alternative high school. Across the district, 67% of the students are from low income families and 52% are students of color (African American 8%, Asian 13%, Pacific Islander 2%, Native American 3%, Hispanic 26%). Over 1,100 students are designated as English Learners, and over 900 receive special education services.

CSD's academic goals, adopted after an extensive community input process, drive the work of the district:

- Every child performs at grade level in reading, writing and math by the end of 3rd grade;
- Every child leaves 8th grade academically ready for 9th grade;
- Every student finishes 9th grade with credits necessary to graduate on time; and
- Every student graduates college and/or career ready.

These goals are based on two fundamental beliefs:

- Ethnicity, economic circumstance, primary language and special needs do not predict academic success; and
- Effective use of research-based instructional strategies predicts academic success.

District Strategic Planning and Data Analysis

During the 2017-18 school year, CSD has undergone an intensive district-wide strategic planning process, engaging building-based teams in rigorous data analysis in order to inform school and district-level priorities moving forward. Through this process, stakeholders examined multiple measures of data - achievement, perception, demographic, and process data - and identified a need and urgency around improving student outcomes in math and science, including closing achievement gaps between student groups.

Student achievement in math has declined in recent years: 43% of Centennial Middle School students met or exceeded Smarter Balanced Assessment (SBA) Math in 2016-2017, down 47% from the prior school year. Thirty-two percent of Centennial High School students met or exceeded SBA Math in 2016-2017, down 34% from the prior school year. In addition, achievement gaps persist in math and science for all historically underserved groups, most

notably for African American students whose scores decreased by 10% in 2016-2017, with 21% meeting or exceeding. Although the OAKS Science assessment is still transitioning to become aligned to the Next Generation Science Standards and therefore yields less reliable data in terms of assessing the current standards, there are still achievement gaps (economically disadvantaged, African American, Hispanic, and female students all scored less than the general population of students). More information about the CSD student achievement gap is included in Section II: Project Beneficiaries.

As a part of the district strategic planning process, students, staff, and parents took perception surveys in Fall 2017. The October 2017 CSD Middle School Student perception survey indicated low levels of choice and engagement with disproportionately low perceptions among historically underserved students. Students disagreed or were neutral about having choice in learning. Students were mostly neutral about having fun learning. African American students were less satisfied than other student groups on most indicators. The qualitative data analysis revealed that students did not feel authentically engaged in their learning, which pointed to a need to address instructional design and practices.

The district administered several teacher surveys in Fall 2017, including a math survey to better understand strengths and challenges of CSD's current adopted math curriculum. SY2017-18 is CSD's third year implementing the adopted math curriculum, and the first year implementing the new digital science curriculum. Math teachers indicated a need for greater support and resources to differentiate math instruction. The staff perception survey data indicated that teachers agree or strongly agree with the importance of differentiated instruction, integrating instruction across content areas, use of computers, and addressing students' learning styles. Science teacher focus groups conducted in October 2017 indicated that some teachers were still in the process of learning how to implement classroom technology, while others were very comfortable with using devices with students, highlighting the importance of differentiated professional development moving forward.

The staff perception survey data also revealed that while staff agreed or strongly agreed every student can learn, they were neutral that the school provides an atmosphere where every student can succeed. Teachers identified needs for more equitable practices and outcomes, and for culturally-relevant practices. Teachers also expressed observing low levels of student engagement.

The district strategic planning process also intentionally focused on better supporting students who have been historically underserved in the district by having many of CSD's community partners, including culturally-specific organizations, provide input and feedback on the draft strategic plan. More information about the CSD strategic planning process and those involved is included in Section III: Project Partners and Beneficiaries.

CSD Instructional Strategy for Math and Science

CSD's instructional strategy to improve math and science achievement, while accelerating achievement for historically underserved students, is through an integrated, hands-on, student-centered instructional approach referred to as Project-Based Learning.

"Gold Standard" Project-Based Learning (PBL) and Technology

Project-based learning (PBL) is a research-based instructional approach that supports increased academic achievement, 21st century competencies, educational equity, student engagement, and teacher satisfaction. [1] PBL is, by design, culturally-relevant, engaging, and student-centered. PBL is a driver for educational equity that matches CSD teachers' and students' needs. With student learning goals in mind, teachers design instructional units and lessons that afford students voice and choice in content and assessment options. Students work in groups and independently in this inquiry-based approach that empowers them to take ownership of their learning and connect content standards to their cultures and lives.

The Buck Institute for Education (BIE) created a framework of eight essential elements for teachers to use in PBL when designing projects to ensure deeper learning for students during the instructional unit. See Section III: Project Partners for more information about BIE.

1) Key Knowledge, Understanding, and Success Skills: The project is focused on teaching students key knowledge and understanding derived from standards, and success skills including critical thinking/problem solving, collaboration, and self-management.

2) Challenging Problem or Question- The project is based on a meaningful problem to solve or a question to answer, at the appropriate level of challenge for students, which is operationalized by an open-ended, engaging driving question.

3) Sustained Inquiry- The project involves an active, in-depth process over time, in which students generate questions, find and use resources, ask further questions, and develop their own answers.

4) Authenticity- The project has a real-world context, uses real-world processes, tools, and quality standards, makes a real impact, and/or is connected to students' own concerns, interests, and identities.

5) Student Voice & Choice- The project allows students to make some choices about the products they create, how they work, and how they use their time, guided by the teacher and depending on their age and PBL experience.

6) Reflection- The project provides opportunities for students to reflect on what and how they are learning, and on the project's design and implementation.

7) Critique and Revision- The project includes processes for students to give and receive feedback on their work, in order to revise their ideas and products or conduct further inquiry

8) Public Product- The project requires students to demonstrate what they learn by creating a product that is presented or offered to people beyond the classroom. The product is shared with an authentic audience, which can be parents, community groups, and/or industry professionals, for students to showcase learning, get feedback, and connect to a broader community of practice.

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[1] PBL for 21st Century Success (2013) Boss, S. Buck Institute for Education.

Another critical support offered by BIE is access to its open-source, project-based learning rubrics. A rubric is a coherent set of criteria for work that includes descriptions of levels of performance quality in the criteria. For teachers, BIE has rubrics for project-based teaching, instructional units, and assessments for student work. Students can also access BIE rubrics in an evaluation of their own work. The rubrics ensure rigor and coherence to the projects, as well as supports for diverse learners.

Ravitz and Blazevski (2014)[2] found that technology strengthens PBL, and that teachers using technology to implement PBL were less challenged by barriers such as lack of time, professional development, and coaching. For example, teachers can access:

- Online collections of PBL resources (e.g. rubrics, templates, examples, descriptions, suggestions, video) and online tools to design and manage projects;
- Robust PBL professional learning networks through websites or social media to receive feedback from others on projects or student work;
- Classroom management software (e.g. Hapara) to ensure that students are on-task on their devices;
- PBL tools while moving around the classroom to guide students in group or individual work; and,
- Digital assessment and feedback data collected electronically (e.g. Google Forms, iReady) to tailor lessons and instructional interventions to student needs.

The integration of technology with PBL also supports students. During a project, students can use:

- Technology to search for information, validate sources, and access interactive simulations/models;
- Cloud-based tools (e.g. Google Apps for Education) to post work for teacher assessment or to get feedback from fellow students or others, including outside industry experts and mentors (e.g. nepris.com);
- Collaborative technologies (e.g. Google Slides or web-based concept maps) to manage their group work; and,
- Online tools (e.g. blog, wiki, listserv, social networking) to access to multiple perspectives on their ideas and project.

Access to technology can dramatically reimagine PBL's Essential Element 8, Public Product, (as described previously) not only through the type of work product students can create (podcasts, films, 3-D models, and graphic representations of data), but also by expanding the audience for these projects outside of the classroom and school community*[3]

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[2] Ravitz, J. , & Blazevski, J. (2014). Assessing the Role of Online Technologies in Project-based Learning. Interdisciplinary Journal of Problem-based Learning, 8(1). Available at: http://dx.doi.org/10.7771/1541-5015.1410

[3] The Buck Institute for Education created http://pblu.org/projects- **Making Projects Click.** In PBLU, teachers can download projects and enroll in classes about Project Based Learning. The projects have been designed by BIE and its partners to allow teachers to focus mainly on how to implement a project rather than how to design one. The classes are developed and facilitated by BIE, and focus on project design, management and assessment.

English Learners and students with disabilities can particularly benefit from a PBL approach. By collaborating in small groups, English Learners can have frequent opportunities to engage in academic conversations with their peers. Teachers can access technology and apps that support differentiated resources for students at varying language levels to access the same content as other students (e.g. Newsela is a website that features the same science-content articles in various reading levels). Up-to-date resources are more easily obtained digitally in languages other than English. Students with disabilities and English Learners can also access a host of assistive technology (e.g. Snap-n-Read for text-to-speech with some language translation capability; Co-Writer for word prediction; Chrome extensions with vision supports/calculators/equation dictation; Math notation tools; digital graphing supports; virtual manipulatives). Particularly for English Learners and students with disabilities, having access to these forms of assistive technology increases the likelihood of their active engagement in class and broadens the possibilities for the types of projects students can create and showcase.

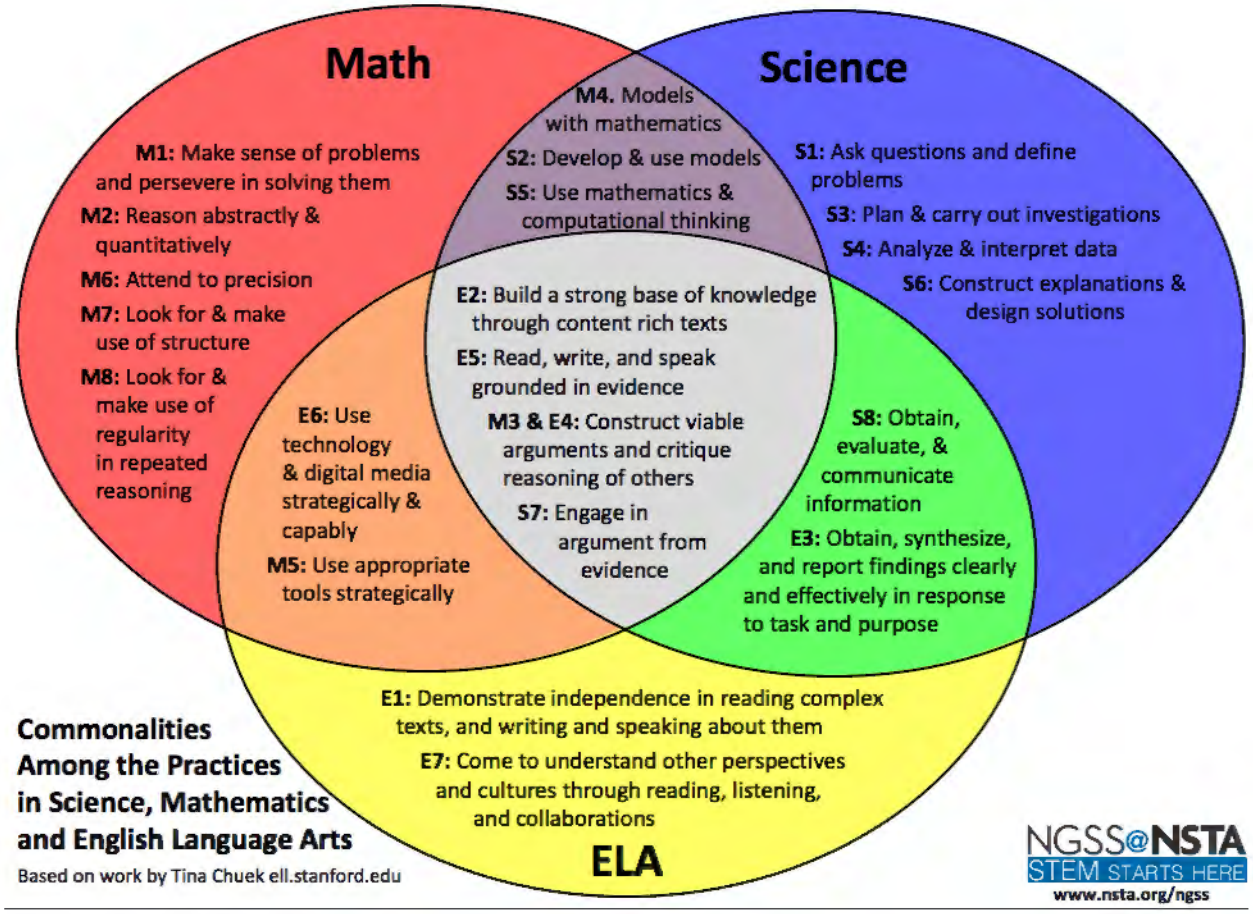
Math and Science Alignment with PBL

A math and science focus is well-supported by the structure of the Next Generation Science Standards (NGSS) and the Common Core State Standards (CCSS) for Mathematics. Each NGSS standard not only describes the student knowledge and skills required for mastery, including engineering and technology practices, but also references supporting standards in math and literacy, which make it easier for educators to integrate other subjects within their own content areas.

CCSS for Mathematics also supports PBL as an instructional strategy. In the book, Setting the Standard for Project-Based Learning (2015), Larmer, Mergendoller and Boss make the case that PBL aligns with the CCSS...and it is one of the best ways to achieve the goals of the Common Core. **CCSS Math** include:

- "Fewer standards, more depth—Well-designed projects have always emphasized deep conceptual understanding and critical thinking when solving problems, developing and answering a driving question, and creating high-quality products."
- Real-world applications—The Common Core Standards for Mathematical Practice highlight the ability to apply math to solve "problems arising in everyday life, society, and the workplace"—exactly what happens in a good project.

The graphic below shows the natural convergences among the Common Core Math, NGSS, and the Common Core English Language Arts standards. The NGSS are organized to explicitly state which CCSS Math standards are directly connected. As teachers design project-based instruction, they will be supported in following the structure of the standards themselves, many of which are reinforced in multiple subject areas.



Math and Science Integrated Project-Based Learning

CSD's **Math and Science Integrated Project-Based Learning** (Project) will support Centennial 7-9 grade math and science teachers to implement PBL instruction by working with students to design interdisciplinary projects that apply to real-world problems.

Students in classes of participating teachers will share their projects with their families through school-based events, and with community partners, as appropriate to the project. High-quality, up-front professional development and on-site coaching will support teachers in designing instruction that aligns to the BIE's Eight Essential Elements, while explicitly designing supports for English Learners and students with disabilities.

Math and Science are the two most recently adopted curriculum at CSD (math in 2016 and science in 2017). Offering in-depth professional development opportunities for teachers in these subject areas is timely to support adjustments to classroom practice in light of new materials. The Project will build on the implementation of the new math and science curricula and will support teachers in incorporating technology into their instruction in meaningful, transformative ways. It will also build teachers' capacity to design interdisciplinary projects that are relevant and engaging to students, and which challenge students to demonstrate 21st century competencies (collaboration, communication, creativity, critical thinking).

CSD will phase implementation of the Project over four school years. A cohort of 7-9th grade math and science teachers will be onboarded over the first three years of the Project, beginning with two 8th grade and two 7th grade teaching teams in SY18-19. Over time, all Middle School teaching teams will participate, as well as 9th grade teachers at Centennial High School (32 teachers total). Investing in a 7-9th grade project aligns with district goals around 8th grade readiness for high school as well as 9th grade math/science credit attainment.

Onboarding/Cohorts				
School Year	**18-19**	**19-20**	**20-21**	**21-22**
# PTs	*8 Participating Teachers*	*24 Participating Teachers*	*32 Participating Teachers*	*32 Participating Teachers*
Cohort 1	Eight 7th/8th grade Math/Science teachers (CMS)			
Cohort 2		Remaining Eight 7th/8th grade Math/Science teachers Eight 9th grade Math/Science teachers		
Cohort 3			Remaining Eight 9th grade Math/Science teachers	
STEM Coach Support	Full-time coach supports Cohort 1 and builds capacity in Cohort 2	Full-time coach supports Cohorts 1 and 2 and builds capacity in Cohort 3	Full-time coach supports Cohorts 2-3	Half-time coach supports on Cohort 3

Teacher Cohorts will create and implement two integrated math/science PBL units per year. As a part of that process, teachers will self-reflect using the rubrics on the effectiveness of those projects and will engage in an iterative revision process following the implementation of each project to identify areas for future growth. PBL units will be archived and curated for other participating teachers to develop a digital community of practice. Teachers will engage in high-quality, up-front, three-day training about PBL and will build on this foundation through an on-site Science, Technology, Engineering, Math (STEM) Coach dedicated to integrating pedagogy and technology tools.

The relatively small size of the Cohort 1 will afford extra opportunities for the participating teachers, with the support of the STEM Coach, to use an inquiry-based approach to identify, pilot, evaluate, and scale technology supports (software and hardware) that will be used in later cohorts.

Cohort 1 will be comprised of teachers who are enthusiastic about the project but represent various experience and comfort levels with technology use. By supporting a range of developmental levels within Cohort 1, the STEM Coach will be able to determine effective types of support to provide a diverse group of teachers moving forward. If teachers experience barriers to using technology, the Coach will support them in identifying those barriers and removing them. For example, some teachers may be uncomfortable with the logistics of managing 30 students on devices. Others may need to see a model for technology integration. The STEM Coach will be able to work one-on-one with teachers to identify supports needed. Additionally, with a focus on building teacher capacity, Cohort 1 teachers will consult with their peers in later cohorts to champion risk-taking, and lead by example in growing their teaching practice to use project-based and technology-rich approaches.

The Project intentionally builds capacity in each school year by identifying the teacher cohorts in the school year prior to implementation in the classroom. Teacher cohorts will have access to the technology for experimentation and will receive support from the district coaches and the STEM Coach to take the first steps toward technology integration, logistics and device management, and use of Google Apps for Education. Having this experience in advance of having students will help teachers develop skills for classroom device use and management and identify challengers prior to participating in PBL professional development.

With the support of the STEM Coach, teachers will also have the opportunity to explore ideal physical space configurations most conducive to project-based learning. For example, teachers may choose to have classroom furniture that supports students in groups, and students' ability to move around more freely, and access digital tools and whiteboard space. The STEM Coach will facilitate this reflection for teachers and identify physical space resources needed to promote a collaborative, inclusive, and innovative classroom environment.

Significantly, PBL affords all students opportunities to learn from and contribute to mixed-ability peer groups, which supports students to practice collaborating towards a common goal, using academic dialogue. The 'voice and choice' element of PBL enables students to demonstrate mastery in a variety of ways, using multiple modalities, and accessing talents and strengths that can go undiscovered in a 'traditional' teacher-centered classrooms. For example, instead of an instructional unit culminating in a 5-paragraph essay that all students must complete, a PBL unit would engage students in rigorous writing during sustained inquiry, but would support a variety of options for student public products (e.g. photo essay, podcast, short film, 3-D model, etc.).

With an intentional focus on supporting English Learners and students with disabilities, the STEM Coach will facilitate the process of identifying supportive, responsive, and assistive technology, informed not only by the district's existing procedures developed by the District Technology Coach, but also by the district's Equity Lens.

CSD is an inclusion district and, to the extent possible, teachers and specialists collaborate and push-in support to serve students with disabilities and English Learners within the general education setting (as opposed to "pull out"). Specialists (Special Education and English Language Development teachers) will receive Project onboarding during the regularly-scheduled preservice days before school begins. Specialists have dedicated time within the school schedule to collaborate with participating teachers through Professional Learning Communities. These PLCs will continue to be a primary vehicle for teacher collaboration, with intentionality around meeting the needs of students with disabilities and English Learners.

CSD was selected to receive a Meyer Memorial Trust Equity Grant focused on building capacity around equity and culturally-relevant practices over the 2018-19 school year. The Project will build on this grant as district coaches, including the STEM Coach, will regularly engage in professional development focused on instructional coaching for culturally-relevant practices. The Meyer Memorial Trust Equity Grant will span the 2018-19 school year and will build capacity in CSD's instructional coaches to develop teachers' culturally responsive practices.

Professional Development (PD) for Participating Teachers

Teachers will be supported in implementing rigorous, integrated PBL experiences for students through an immersive Summer seminar, on-site coaching, and use of rubrics. The professional development (PD) is designed to ensure teachers have opportunities for peer collaboration to inform their professional growth, PBL instructional design, and project development.

CSD currently has effective collaborative PD structures in place, which provide a strong foundation for the Project. PD is delivered both at the district and school levels, and is supported by grade level Professional Learning Communities (PLCs). The district's collective bargaining agreement with teachers includes designated time for grade level teams of teachers to meet weekly in PLCs. During this time, teams use a variety of protocols to follow an inquiry cycle (plan → teach → reflect → apply) based upon the research of DuFour[4].

In addition to PLCs, CSD has invested significantly in instructional coaching positions - both at the district and school levels. Annual PD for coaches is provided by the Multnomah Educational Service District (see Section III: Project Partners). The facilitator differentiates workshops for the various experience levels of coaches so that they can, in turn, provide PD and coaching for classroom teachers. Coaches provide 1:1 coaching, grade level PLC coaching, and facilitate lesson study cycles with groups of teachers across grade levels and content areas.

Summer PBL Seminar: Each summer, the new cohort of teachers will engage in three full days of PBL training facilitated by the Buck Institute for Education (BIE- see Section III: Project Partners), prior to the beginning of the school year, in how to design, assess, and manage project-based curriculum. Topics to be covered include:

- Foundational understandings of project-based learning
- Culturally-relevant practices and PBL

[4] A professional learning community (PLC) is defined as "educators committed to working collaboratively in ongoing processes of collective inquiry and action research to achieve better results for the students they serve. Professional learning communities operate under the assumption that the key to improved learning for students is continuous, job-embedded learning for educators (DuFour, DuFour, Eaker, & Many, 2006).

- Using rubrics to create high quality PBL opportunities
- Family engagement and PBL
- Designing your first PBL unit
- English Learner scaffolds for language development

One of the benefits of partnering with BIE is its strong PD workshops that include field-tested rubrics for project design, implementation, and student work. Rubrics ensure a common language and definition around high-quality, project-based teaching and learning.

August Pre-Service: Each summer, the new cohort of teachers will participate in one half-day of technology management PD, covering device management, Hapara, Google Classroom, and student digital citizenship. This will be co-facilitated by the STEM Coach and the District Technology Coach. Content will be differentiated based on teacher experience and need.

Ongoing Professional Development:

- Lesson Study Cycles- All participating teachers will be released for two half-days to engage in lesson study cycles, facilitated by the STEM Coach, during which teachers co-plan lessons aligned to project focus areas (e.g. effective use of digital resources, use of data to plan instructional interventions, STEM lessons). The model for CSD's lesson study cycles was developed in a previous grant partnership between CSD, David Douglas School District, and Portland State University, through which an independent evaluator determined that a positive correlation existed between the professional development offered for participating teachers and student achievement.
- Instructional Coaching: Teachers will receive 1:1 coaching from the STEM Coach (embedded professional learning differentiated to teacher needs).
- Professional Learning Communities (PLCs): PLCs are an existing weekly CSD practice and are generally facilitated by the participating teachers. PLCs examine data in order to answer four questions: *What do we want students to learn? How will we know whether they learn it? What will we do for students who don't learn? What will we do for students who already know it?*
- PLC Coaching: Depending on desired outcomes, the STEM Coach or District PLC Coach may join teachers during PLC time to meet collaboratively-developed professional goals.
- Meyer Equity Grant: District-facilitated PD for coaches with the dual purpose of fostering greater personal reflection and awareness of race by using racial equity protocols and training around deeper understanding of and coaching for culturally-relevant classroom practices.
- In-service Days: Twice per year (October and January) cohort teachers will use their release time for Project PD. By triangulating observation data, teacher survey data, and student achievement data, the STEM Coach will collaborate with administration staff and teachers to create a plan for the day responsive to needs. Topics will stem from August Pre-Service PD strands: technical training on the use of digital tools to support high quality instruction, use of data to inform instruction, math and/or science content-related PD, integrated math and science lesson development.

Role of the Science, Technology, Engineering, Math (STEM) Coach

Job-embedded PD through coaching is critical to supporting teachers in making meaningful adjustments to their instructional practice by deeply reflecting on their practice. Instructional coaching is a research-based, transformative process. It is a structure through which new learnings gained through PD are practiced and applied with the collegial support of the coach. Imbedded, on-site coaching is also an emerging promising instructional practice from the TechSmart evaluation.

CSD has well-established coaching PD at the elementary and district levels; CSD coaches follow a common instructional coaching model and attend annual coaching workshops (see Section III: Project Partners). Coaches use protocols around 1:1 coaching, Professional Learning Communities (PLCs), PLC coaching, and lesson study cycles. The STEM Coach will work collaboratively with the District PLC Coach, District Technology Coach, and District Assessment Coach to support the Project.

The STEM Coach will lead 1:1 coaching cycles and lesson study cycles for participating teachers, as well as support future cohort teachers with 'on demand' support to build their capacity around the implementation of technology. The STEM Coach will deliver both content (math and science, depending on content area) and digital pedagogy (how to use technology to accelerate and personalize learning for students). The STEM Coach will also receive up-front and ongoing PD to better fulfill her/his responsibilities:

- Implement 1:1 coaching for individual teachers: Meet with individual teachers, setting goals for growth tied to professional standards of practice, and engage in observation and debrief using one of the following approaches, depending on the needs of the teacher:
  - Instructive: Coach directs, provides information, and makes suggestions based on the teacher's needs and data. This approach is often used with newer or struggling teachers.
  - Collaborative: Coach influences rather than dominates the conversation; coach and teacher work together to analyze data and plan solutions.
  - Facilitative: Coach facilitates discussion through questioning; teacher does most of the talking and self-reflection.
- Provide technical expertise around technology integration; lead the teams, including Special Education and English Language Development Teachers, in coordinating and identifying apps and other digital resources to support effective instruction in math and science. With the input of the participating teachers:
  - Identify areas through which science and math standards strongly align;
  - Facilitate professional development which supports the creation of integrated lessons/units by teachers
  - Embed culturally-relevant practices and use of Equity Lens within all aspects of coaching work
  - Curate digital resources created during the project, including curriculum maps, lessons and units that identify interdisciplinary connections between math, science, and technology
  - Identify effective assistive technology for students with disabilities and English learners.
- Lead other job-embedded PD, including modeling instruction, PLC coaching for teacher teams, release days for data analysis, and lesson study cycles.

- Support teachers' use of student data to plan instructional interventions.
- Collaborate with Director of Curriculum & Student learning and school principal responding to teachers' needs.
- Collaborate with CSD coaches at monthly district coaches' meetings to refine coaching practice and access additional support for participating teachers.
- Curate PBL units developed by teachers within a shared website for project teachers.
- Model the use of the district Equity Lens throughout work, particularly in supporting effective project design and identifying needed resources within first cohort to complement PBL.
- Support cohort teachers in identifying technology and physical environment resources to support project-based teaching and learning.
- Support teachers with family engagement through students' PBL.

Parental Engagement

The district and schools will highlight the TechSmart project in its communications to families and the community, not only to publicize the exciting work, but also to help families and the community understand shifts in teaching and learning that will look different than traditional, teacher-centered models that many have experienced in their own educational experiences. Furthermore, families will be engaged in students' presentations of learning as they showcase projects they create over the course of the school year, as well as during calendared parent-teacher conferences.

Project Outcomes

The Project is organized around this theory of action:
With effective use of technology and well-implemented project-based learning, educators will engage students in deeper learning that will accelerate their academic achievement and better prepare them to succeed in college, career, and as engaged citizens.

To this end, the Project has three primary outcomes:
(1) Teachers know how to develop effective PBL units that incorporate culturally-relevant practices and meaningful, transformative technology.

(2) Teachers effectively implement PBL practices and strategies that incorporate culturally-relevant practices and meaningful, transformative technology integration.

(3) The use of technology-supported PBL instruction develops students' 21st century skills (creativity, collaboration, communication, critical thinking).

II. PUBLIC BENEFIT

The Centennial **Math and Science Integrated Project-Based Learning** targets the following TechSmart academic outcomes:

- Eighth Grade Math
- Ninth grade credit attainment in Math and Science
- English Language Learners' progress

At the surface, CSD student achievement data at the secondary level shows that the district is generally on par with, and in some cases performing above, state achievement averages. However, CSD has significant and persistent achievement gaps between subgroups: students of color, students in poverty, students with disabilities, and English Learners consistently lag behind white/Asian students, more affluent students, English-only students, and students without disabilities.

See Attachment A: Student Achievement Data

III. PROJECT PARTNERS AND BENEFICIARIES

The Project beneficiaries include approximately 1,500 CSD students over three years in grades 7-9, and the teachers and staff who serve them.

A variety of internal stakeholders provided feedback on and contributed to the design of the Project, through both face-to-face meetings and via collaboration using Google Docs:

- The Middle School administrative team and lead math/science teachers
- The High School principal and math/science department chairs
- District executive leadership, including the Superintendent and his Cabinet
- Executive Supervisor of IT & Assessment

District Strategic Planning Process
The District strategic planning process, facilitated by Education for the Future, empowered teachers and administrators to analyze multiple measures of data and look for strengths, challenges, and implications to inform systemic supports provided to students. Teachers, administrators, and classified staff from all Centennial schools participated in eight total days of professional learning and strategic planning. Staff data analysis informed the District strategic planning process, through which staff analyzed perception surveys, student achievement, demographic, and program/process data to aggregate district-wide implications. The need for student-centered, rigorous, culturally-relevant instruction emerged as strong themes, and these form the basis for the Project.

As a part of strategic planning, the district mission and vision statements are being revised and shared with stakeholders, including staff, students, and community partners such as the Latino Network, REAP, Metropolitan Family Services, and the Rosewood Initiative.

Education for the Future (EFF)
Education for the Future is a non-profit based out of California State University at Chico and uses the research of Dr. Victoria Bernhardt to facilitate district and school continuous improvement. EFF facilitated CSD's 2017-18 Strategic Planning process and will administer and disaggregate school perception surveys in the years to come. School and district teams are using the processes and protocols to establish goals and monitor strategic plan implementation. Internal monitoring of the TechSmart Project will be integrated into these newly-implemented leadership structures.

Buck Institute for Education
The Buck Institute for Education (BIE) is a nationally-recognized leader in providing professional development and resources on how to design, assess, and manage projects that engage and motivate students. The BIE developed the "Gold Standard" Project Model, providing definition around seven essential project elements: Key Knowledge, Understanding, and Success Skills; Challenging Problem or Question; Sustained Inquiry; Authenticity; Student Voice and Choice; Reflection; Critique and Revision; Public Product. The BIE has developed rubrics for teachers and students to support effective implementation of project-based learning. For schools, BIE helps bring coherence to PBL practices across grade levels and subject areas, and supports the creation of school-wide processes and structures to support PBL. For districts, BIE offers unrivaled service and expertise in creating and sustaining district-wide PBL initiatives.

Multnomah Educational Service District
The Multnomah Educational Service District (MESD) serves Multnomah County schools by offering centralized resources and supports, including professional development. Centennial coaches, including the STEM Coach, will attend annual instructional coaching professional development hosted by the MESD, described in greater detail in Section I under the professional development description.

IV. IMPLEMENTATION PLAN

See Attachment B: Project Implementation Plan

V. EVALUATION PLAN

CSD will work with Pacific Research and Evaluation (PRE), the MHCRC's TechSmart evaluation partner, to collect and analyze data.

Centennial Middle School has implemented an interim assessment system in Math and English Language Arts, which collects a standardized data point three times per year used to determine students' progress towards mastering grade level standards. SY2017-18 data will be valuable as a baseline against which to compare the impact of instructional innovations in the Project Years 1-4.

The Middle School and High School's leadership teams will follow the EFF strategic planning processes and protocols to regularly assess effectiveness of Project implementation.

Outcome 1: Teachers know how to develop effective PBL units that incorporate culturally-relevant practices and meaningful, transformative technology.

Evaluation Questions: ● To what extent do teachers report that the professional development has improved their knowledge, skills, and practices? ● Are effective supports in place for teachers for use of PBL and technology in the classroom? ● Does professional development support the creation of culturally-responsive PBL opportunities for students?	
Data to Be Collected:	● Staff perceptions of the usefulness of PD, with intentional focus on culturally responsive practices embedded within PBL. ● Impact of the PD on staff confidence to apply content from the PD to classroom instruction. ● Hours of PD provided recorded and organized by type (3-day workshop, lesson study, coaching) and participating teachers ● Teacher self-assessment in project design and project-based teaching using BIE rubrics.
How Data is Collected and by Whom:	● Teacher self-assessments on BIE rubrics collected annually to measure growth (CSD) ● Teacher pre-post surveys (PRE) ● Teacher interviews (PRE)
Related Activities	● 3-Day BIE Professional Development ● Instructional coaching from District Coaches including STEM Coach ● Ongoing professional development for coaches ● Use of BIE rubrics

Outcome 2: Teachers effectively <u>implement</u> PBL practices and strategies that incorporate culturally-relevant practices and meaningful, transformative technology integration.
Evaluation Questions: ● Is technology being used to transform the nature of teaching and learning? ● Are new instructional strategies emerging? ● Are projects rigorous yet highly scaffolded and differentiated to support all learners?

Data to Be Collected:	● Teacher self-assessments of PBL instruction ● Student work samples ● Student perceptions of PBL and technology supported instruction. ● Teacher perceptions of PBL and technology supported instruction ● Observation of classroom instruction
How Data is Collected and by Whom:	● Teacher self-assessments on BEI rubrics collected annually to measure growth (CSD) ● Student work samples assessed using BEI rubrics (CSD) ● Teacher pre-post surveys (PRE) ● Teacher interviews (PRE) ● Leadership interviews (PRE) ● Student survey (PRE) ● District student perception survey disaggregated by TechSmart participants (CSD) ● District staff survey disaggregated by TechSmart teachers (CSD) ● PRE's Classroom observation tool (CSD)
Related Activities	● Teachers collaborate to implement at least two interdisciplinary PBL units per school year. ● Teaching teams collaborate with building administration to feature at least one showcase per year of student PBL work. ● Teachers implement and localize BIE rubrics in order to develop highly scaffolded, authentic projects. ● With ongoing support, teachers progress at least one level per year on the project-based teaching unit, with Cohort 1 achieving "Gold Standard" by year 3 of implementation. ● Teachers understand and integrate digital citizenship norms into their students' learning and family communications. ● Teachers effectively and routinely integrate and leverage technology for students' deeper learning.

Outcome 3: The use of technology-supported PBL instruction develops students' 21st century skills (creativity, collaboration, communication, critical thinking).

Evaluation Questions: ● Do PBL units incorporate students showcasing work to an authentic audience? ● How are families engaged within this process to support the development of students' 21st century skills? ● What are effective ways to assess growth in students in regards to 21st century skills? ● What are high-leverage classroom practices that will support students' 21st century skills?	
Data to Be Collected:	● Student self-assessment in Creativity and Innovation ● Student work samples ● Observation of classroom instruction ● Teacher perceptions of students' 21st century skills ● Family perceptions of 21st century skills
How Data is Collected (and by whom):	● Student self-assessment using Innovation BIE Rubrics (CSD) ● Student digital portfolios (CSD) ● Student work samples assessed using BIE rubrics (CSD) ● District student perception survey disaggregated by TechSmart participants (CSD) ● PRE's Classroom observation tool (CSD) ● Family perception surveys collected annually via online survey (CSD) ● Attendance sign-in sheets for family engagement events (CSD) ● Student survey (PRE) ● Teacher pre-post surveys (PRE) ● Teacher interviews (PRE)
Related Activities	● Implementation of minimum of two project per year feature student-centered instruction around real-world problems meaningful to students' own lives, cultures, communities, and identities. ● Students integrate skills across disciplines (Math and Science are the project focus, but also across ELA and Social Studies). ● Students work productively in teams, using technology for ongoing research, product creation, critical thinking, self-directed learning, and collaboration. ● Projects will be differentiated to students' needs, but ensure that all students have the scaffolds they need to access rigorous instruction, in particular language scaffolds for English Learner students.

	● Students present, showcase, and authentically engage stakeholders in their work across the district and community <u>at least once per year</u>.

Outcome 4: Improve student outcomes as measured by achievement in Math and Science, 9th grade credit attainment, and English Learners' progress.	
Evaluation Questions ● Is Math and Science Integrated PBL improving student achievement in Math and Science? ● Is Math and Science Integrated PBL having a positive effect on closing achievement gaps for historically underserved students? ● To what extent does implementing PBL supported by technology impact student attendance, behavior, engagement, achievement, and credit-attainment? ● What technology-supported instructional strategies are most effective in increasing student achievement and closing achievement gaps?	
Data to Be Collected:	● Math and science summative achievement data ● Math interim assessment data ● Credit attainment in grade 9 for math and science ● Student self-report learnings ● Teacher perceptions of student learning ● Family perceptions of student learning

How Data is Collected and by Whom:	• State SBA assessments in grades 7-9 disaggregated by race, EL, gender (CSD) • District interim math assessment (CSD) • 9th grade credits for math and science courses (beginning with Year/Cohort 2) (CSD) • Student behavior data (CSD) • Student attendance data (CSD) • District student perception survey disaggregated by TechSmart participants (CSD) • District parent perception survey (CSD) • District staff survey disaggregated by TechSmart teachers (CSD) • Student survey (PRE) • Teacher pre-post surveys (PRE) • Teacher interviews (PRE)
Related Activities	• Teachers collaborate around the use of rubrics to ensure that projects are rigorous, standards-based, culturally relevant, differentiated, and supportive of students' unique learning needs. • Teachers and administrators analyze interim assessment data to monitor students' progress towards standards mastery and to inform project evaluation. • District Coaches, including STEM Coach, support teachers in planning and implementing high leverage instructional strategies within a PBL model that is responsive to student needs. • Instructional Leaders (building/district admin) effectively support teacher professional development and growth. • Families are effectively engaged as partners in students' progress and learning; help to inform effective outreach, communication, partnership strategies to support parent engagement in student achievement.

VI. TECHNICAL DESIGN

The District Technology Committee, in partnership with the Information Technology (IT) and the Curriculum & Student Learning departments, identified the Chromebook as the most grade-level appropriate device for achieving CSD's instructional goals and outcomes. IT will work with the district's preferred local vendor, CTL, to purchase the devices and storage/charging carts. CTL's J41 Chromebook device has proven to be a reliable, low-cost, and low-maintenance product. It's Intel processor, 4GB or RAM, ISP screen, and rugged design all contribute to it being selected as the best devices for the Project.

Because of the Project's focus on rich, digital curriculum and resources that foster student engagement and personalized learning, the district will proceed with a 1:1 device ratio. Each

participating classroom will have a mobile charging cart with Chromebooks. The Chrome Web Store, Google Play Store, Google Apps for Education and other cloud-based web applications will help to supplement science and math adopted curriculum. Those resources will be identified, cataloged, and shared during the entirety of the Project:

- Google Classroom (used for digital instructional delivery, student collaboration, teacher feedback, and grading)
- Hapara licensing (used for Chromebook management and student document management)
- GAFE licensing (required by Google for each Chromebook device)
- Math Interim Assessment (iReady)

The Project technology will include the following:

Devices - Supports personalized, differentiated learning, student group collaboration and communication, and the use of digital software to enhance instruction, assessment, and curriculum.

- Classrooms: 32 Chromebook charging carts, each with 36 CTL NL7T Touchscreen Chromebooks (1,152 total Chromebook)- one for each participating teacher's classroom. These devices, with touchscreens will provide increased functionality for use in math classrooms, with students able to graph and write equations more easily.
- 5% spare Chromebook devices for exchanges during repairs (57 devices)
- Staff Chromebooks: 32 participating teachers, four specialists, STEM Coach (costs for the staff devices are included as a district match in the Project budget)

Classroom Technology- Supports teachers' effective lesson delivery and communication.

- 16 projectors and document cameras for 7th and 8th grade math and science classrooms
- 16 projectors and document cameras for 9th grade classrooms (costs for this equipment and installation are included as a district match in the Project budget)

Non-Consumable Science Technology- Affords students access to hands-on, experiential learning called for by the Next Generation Science Standards

- OMAX 5MP Digital Microscopes (5 per 7th-8th grade science classroom)
- Pocketlab Voyagers (wireless sensors compatible with digital data collection app (set of 10 per participating 7th-9th grade science classroom)
- Spectrophotometer (1 per 7th-9th grade science classroom)

Non-Consumable Math Technology- In addition, a variety of free Chrome extensions explored during the initial implementation phase will be identified and scaled, such as:

- Virtual math manipulatives (e.g. Math Learning Center)
- Math equations dictation (e.g. gMath)
- Math equation manipulator (e.g. Graspable Math)
- Calculators
- Formulas and computational support (e.g. Wolfram Alpha)

Interim Assessment

Computer adaptive interim assessment, iReady, provides teachers with actionable assessment data used to identify instructional supports or extensions needed by students. This assessment is

licensed on a per-student, annual basis. iReady data helps teachers to identify areas of need for students and can be disaggregated by race and other student groups.

Apps and Assistive Technology

- Hapara, and other apps for technology management
- As described Section 1: Project Purpose, the STEM Coach will work with participating teachers to apply the district equity lens while piloting new software and identifying which to bring to scale. Some assistive technology is free (e.g. Chrome extensions) while others are issued on a per-student basis or by site-license

Physical Space Equipment/Furniture

Teachers will work with the STEM Coach as they deepen their understanding of project-based learning to identify needs around physical space (e.g. more flexible furniture, whiteboards, easily-movable chairs) to foster a more collaborative and innovative environment.

The student devices selected are anticipated to function at full capacity for five years. The district's IT Department is currently developing a budget model to ensure the student and staff equipment has a predictable refresh cycle in accordance with industry best practices. IT will replace/maintain lost, stolen, or damaged devices during the Project term, which will ensure equipment provided to each classroom remains sufficient and in good working order. These devices will be enrolled in a mobile device management system which allows us to provision and track the devices, harden them from misuse or threats, and easily deploy applications and configuration to support instruction.

VII. ORGANIZATIONAL CAPACITY

The following elements are in place or emerging, which make the District ready to implement the **Math and Science Integrated Project-Based Learning.**

Superintendent and School Board

A commitment on the part of the Centennial School Board and the Superintendent to academic growth and closing achievement gaps with Centennial students is evidenced by:

- Adoption of district belief statements in spring 2010 and the district Equity Policy in spring 2013.
- Adoption of the district's Non-Negotiable Goals, including:
  - Every child leaves 8th grade academically ready for 9th grade;
  - Every student finishes 9th grade with credits necessary to graduate on time; and
  - Every student graduates college and/or career ready.
- The Superintendent signing the Future Ready pledge which is a firm commitment to implementing meaningful changes toward a digital learning transition that supports teachers and addresses the district's vision for student learning.
- Additional funds added into the district IT budget during a time when cuts were being made across the district due to decreasing funds from the state.
- Superintendent fully supports the *TechSmart* project as a response to the achievement and perception data that emerged through the Strategic Planning process.

Curriculum & Instruction
The Project plan aligns with Department of Curriculum & Student Learning past investments in staff capacity as well as vision for future work in the district:

- District Technology Committee: During the 2013-14 and 2015-16 school years, key staff including principals, teachers, district administrators, and IT personnel formed a committee to review Common Core technology-related standards, district technology standards, and potential device options to make recommendations around device selection for 1:1 deployment.
- Math Leadership Team (MLT): The district, in partnership with David Douglas School District, invested in continuous and progressive professional learning opportunities for a cohort of CSD K-12 math teachers. This partnership developed a model of lesson study being scaled throughout the district, which will inform the STEM Coach's work with participating teachers.
- Strong organizational focus on standards-based instruction, Professional Learning Communities, and instructional coaching will serve as a foundation upon which to build.
- Emerging district vision for STEM aligned to State of Oregon's STEM Education Plan.
- Centennial is a partner with the regional East Metro STEAM Partnership (EMSP).

Information Technology
The Information Technology Department has taken the following steps to ensure this technology-based project will positively impact students' achievement:

- Supervisor participates in bi-monthly administrative council and curriculum council meetings to collaborate with building and district administrators.
- Invested over the last four years in both wired and wireless infrastructure to take steps toward having a network capable of handling the number of device connections for both students and staff.
- Invested in mobile device management software with IT staff training to ensure an adequate support structure for student and staff devices.
- Added two IT positions (Systems Administrator and Help Desk Technician) to ensure timely and adequate responses to student and staff technical needs.

Instructional Leadership
Participating school administrators will continue to engage in professional learning and collaboration with colleagues in the following ways:

- Bi-monthly administrator meetings (Curriculum Council) facilitated by the Director of Curriculum and Student Learning (including Executive Supervisor of Instructional Technology). At these meetings, there are regular, ongoing discussions about instruction, how it is monitored for implementation, results, and possible changes needed.
- Principals regularly share building-level data and effective practices from their schools at the bi-monthly Administrative Council meetings.
- Regular practice using teacher evaluation rubric, the Danielson framework, to ensure alignment and consistency across the K-12 system. The PRE classroom observation tools used for evaluation align with this framework and incorporate observable criteria for effective use of technology.

VIII. REPLICABILITY

Teaching Team Approach in Grades 7-8
While the Project focuses on Math and Science integration within grades 7-9, due to the teaching team structure at Centennial Middle School (grades 7-8), CSD is committed to including the teams' English Language Arts (ELA) and Social Studies teachers in the project professional development so that project-based learning can integrate ELA and Social Studies learning to provide authentic real-world applications of learning. The associated costs for their participation are not included in the Project budget.

Curating Resources
Participating teachers will digitally curate projects, which will a create a shared resource for other teachers.

Identifying and Scaling Culturally-Relevant Practices
Within the district's focus on educational equity and culturally-relevant practices, the K-12 administrative team will regularly share promising practices to inform district-level professional development. This will happen in a variety of channels:

- Biweekly Curriculum Council meetings
- Biweekly Administrative Council meetings
- Annual "CSD Learning Conference"- a professional development conference hosted each winter at which teacher leaders present workshops to their peers.
- Monthly District Equity Committee

Sharing findings
CSD is committed to the partnership with MHCRC and the overall goals of the TechSmart Initiative. The district will share findings with other districts participating in the Initiative and looks forward to learning from other district's efforts through:

- Monthly Curriculum Director meeting at Multnomah Education Service District
- Oregon Leadership Network
- East Metro STEAM Partnership meetings
- Meetings convened or supported by the MHCRC to share learnings from projects funded through the TechSmart Initiative.

Middle School English Language Arts and Social Studies Teachers
As members of the middle school teaching teams, ELA and Social Studies teachers will participate in Buck Institute PBL professional development as well as lesson study cycles. These teachers' costs are not included in the Project budget.

IX. BUDGET

Line Item Budget

COST CATEGORY	GRANT FUNDS	MATCH	TOTAL
PERSONNEL	$0	$985,001	$985,001
EDUCATION AND TRAINING	$468,300	$91,623	$559,923
TRAVEL	$0	$0	$0
CONTRACTUAL	$0	$0	$0
EQUIPMENT	$676,895	$68,830	$745,725
INFRASTRUCTURE/ FACILITIES	$0	$0	$0
MISCELLANEOUS	$0	$0	$0
OVERHEAD COSTS	$56,115	$59,405	$115,520
TOTAL	$1,201,310	$1,204,859	$2,406,169

Budget Narrative

Personnel

Director of Curriculum and Student Learning

For four school years, the Director will spend 10% (4 hours) per week to direct all aspects of the instructional implementation and provide overall project coordination with the Executive Supervisor of IT. The Director will supervise the STEM Coach, support school leadership teams in monitoring and evaluating implementation, and assist PRE in collecting evaluation data. Based on an average annual salary of $211,183 over the four project years including all benefits, the total cost to the project is $84,473.
Match: $84,473

Executive Supervisor of IT & Assessment

For four school years, the Executive Supervisor will spend 10% (4 hours) per week to provide overall project coordination with the Director of Curriculum. He, along with the Director of Curriculum, will participate on the leadership teams at the schools in order to inform project implementation, and will provide technical support to PRE to assist with the collection of evaluation data. Based on an average annual salary of $162,312 over the four project years, including all benefits, the total cost to the project is $64,925.
Match: $64,925

Centennial Middle School Principal
For four school years, the Principal will spend 20% (8 hours) per week to provide overall project coordination with District staff, teachers and specialists. The Principal will provide instructional feedback to teachers, help to coordinate evaluation activities, support parent communication and outreach, and serves on the school's Leadership Team, which will monitor the implementation of the project. Based on an average annual salary of $195,375 over the four project years, including all benefits, the total cost to the project is $156,300.
Match: $156,300

Centennial Middle School Assistant Principal
For four school years, the Assistant Principal will spend 20% (8 hours) per week to provide overall project coordination with district staff and teachers. The Assistant Principal will provide instructional feedback to teachers, and serves on the school's Leadership Team which will monitor implementation of the project. Based on an average annual salary of $176,120 over the four project years, including all benefits, the total cost to the project is $140,896.
Match: $140,896

Centennial High School Principal
For three school years, the Principal, who supervises the Math department, will spend 10% (4 hours) per week to provide overall project coordination with District staff, teachers and specialists. The Principal will provide instructional feedback to teachers, help to coordinate evaluation activities, support parent communication and outreach, and serves on the school's Leadership Team, which will monitor the implementation of the project. Based on an average annual salary of $204,000 over the four project years, including all benefits, the total cost to the project is $81,600.
Match: $81,600

Centennial High School Vice Principal
For three school years, the Vice Principal, who supervises the science department will spend 10% (4 hours) per week to provide overall project coordination with District staff, teachers and specialists. The Principal will provide instructional feedback to teachers, help to coordinate evaluation activities, and support parent communication and outreach. Based on an average annual salary of $175,000 over the four project years, including all benefits, the total cost to the project is $70,000.
Match: $70,000

Network Administrator
For four school years, the Network Administrator will spend 20% (8 hours) per week to provide wireless network connectivity maintenance to ensure the student and participating staff and teacher devices are connecting at optimal levels and up-time. Based on an average annual salary of $103,847 over the four project years, including all benefits, the total cost to the project is $83,078.
Match: $83,078

Systems Administrator
For four school years, the Systems Administrator will spend 20% (8 hours) per week to provide

technical support, mobile device management, and Tier II/III hardware/software maintenance for the student and participating staff and teacher devices to ensure consistent operability and performance. The Systems Administrator reports to the Instructional Technology Center, which is located adjacent to Centennial Middle School, and will respond to any systems-level needs that arise that may impact usage of the devices. Based on an average annual salary of $103,847 over the four project years, including all benefits, the total cost to the project is $83,078.
Match: $83,078

District IT Technician Assigned to Centennial Middle School
For four school years, a District Technician will spend 20% (8 hours) per week for Tier I hardware and software support for the student and participating staff and teacher devices. IT Technicians report to the ITC, which is located adjacent to Centennial Middle School, and will respond to any needs that arise that may impact usage of the classroom devices and technology. Based on an average annual salary of $92,497 over the four project years, including all benefits, the total cost to the project is $73,998.
Match: $73,998.

District IT Technician Assigned to Centennial High School
For four school years, a District Technician will spend 10% (4 hours) per week for Tier I hardware and software support for the student and participating staff and teacher devices. IT Technicians report to the ITC, which is located adjacent to Centennial Middle School, and will respond to any needs that arise that may impact usage of the classroom devices and technology. Based on an average annual salary of $92,497 over the four project years, including all benefits, the total cost to the project is $36,999.
Match: $36,999

ITC Help Desk Technician
For four school years, the Help Desk Technician will spend 10% of his time (4 hours per week) to provide priority support to the 7th and 8th grade science and math teachers. Support includes: teacher computer, Chromebook devices, and GAFE support. Based on an average annual salary of $80,104 over the four project years, including all benefits, the total cost to the project is $32,042.
Match: $32,042

District Technology Coach
For four school years, the Technology Coach will spend 5% (2 hours per week) per week to provide instructional implementation support, training for teachers, specialists and coaches, and the development of professional development resources. The Technology Coach will work in concert with the STEM coach, with the specific focus of supporting teachers in their use of assistive technology for students. Based on an average annual salary of $139,000 over the four project years, including all benefits, the total cost to the project is $27,800.
Match: $27,800

District Professional Learning Communities (PLC) Coach
For four school years, the District PLC Coach will spend 5% (2 hours per week) to provide training for teachers, coaches and administrators with a specific focus on strengthening the value and function of professional learning communities (PLCs). Based on an average annual salary of

$115,243 over the four project years, including all benefits, the total cost to the project is $23,049.
Match: $23,049

District Assessment Coach
For four school years, the 0.5 FTE District Assessment Coach will spend 10% (2 hours per week) to provide support to teachers, administrators, and coaches with a specific focus on the implementation of the new math interim assessment and the development of NGSS-aligned science assessments. Based on an average annual salary of $66,908 over the four project years, including all benefits, the total cost to the project is $26,763.
Match: $26,763

TOTAL MATCH: $985,001

Education and Training

STEM Coach
In Project Years 1-3, one full-time, dedicated STEM Coach will provide training on STEM instructional practices and technology use for teachers and specialists (see Section I: Project Purpose, Role of STEM Coach for detail). In Year 4, the dedicated STEM Coach will be 0.5 FTE. Based on an annual 1.0 FTE salary including all benefits of $120,000.00, including cost of living adjustments of 2% per year, the total cost is $432,194.
Grant: $432,194

Buck Institute for Education 3-Day Project-Based Learning PD
Each new cohort of participating teachers will attend a 3-day PBL PD provided by BIE. The cost for the 3-day PD is:

- Facilitation of 3-day PD by BIE: $11,750 per year (x 3 years = $32,250)
- Cost to pay teachers at Curriculum Rate ($47/hour x 6 hours x 3 days =$846):
    - Year 1 (Cohort 1) 8 teachers = $6,768
    - Year 2 (Cohort 2) 16 teachers = $13,536
    - Year 3 (Cohort 3) 9 teachers = $6,768

Grant: $32,250
Match: $27,072

Coaching PD
Three District Instructional Coaches (Assessment, PLC, Technology), plus the STEM Coach will attend coaching PD each summer offered by the Multnomah Educational Service District (MESD). The grant will pay for the STEM coach's costs. The district will pay the same costs for its three other participating coaches. Registration is $400 per person x 4 summers =$1,600 per coach. Coaches are paid at curriculum rate ($47/hour) to participate in annual summer instructional coaching professional development offered through the MESD ($47 x 6 hours x 2 days per summer x 3 years = $2,256 per coach)
Grant: $3,856
Match: $11,568

Lesson Study Cycles
Substitute teachers provide release time for each participating teacher to participate in two ½ days devoted to lesson study cycles. This cost covers substitute teachers for the classrooms.

- Year 1 (Cohort 1) 8 teachers x $117 x 2 = $1,872
- Year 2 (Cohorts 1 and 2) 24 teachers x $117 x 2= $5,616
- Year 3 (Cohorts 1, 2, and 3) 32 teachers x $117 x 2= $7,488

Match: $14,976

In-service Days
Participating teachers devote two half-days of in-service per year (Fall, and Winter - specific dates depending on district calendar). During these times, teachers will work in Professional Learning Communities, participate in instructional coaching activities, analyze data to inform instruction, and/or engage in self-reflection relative to PBL rubrics. Based on an average daily rate for teachers of $309, the cost to the project is as follows:

- Year 1 (Cohort 1) 8 teachers x $309 x 1.5 = $3,708
- Year 2 (Cohorts 1 and 2) 24 teachers x $309 x 1.5 = $11,124
- Year 3 (Cohorts 1, 2, and 3) 32 teachers x $309 x 1.5= $14,832
- Years 1-3 Six specialists (ELD, Special Education) will participate (6 x 3 years x $309 x 1.5 days = $8,343)

Match: $38,007

TOTAL GRANT: $468,300
TOTAL MATCH: $91,623

Equipment/Materials

Devices
See Section VI: Technical Design for more detail: 1,209 Chromebooks plus 32 charging carts for classrooms - $453,015; 37 staff Chromebooks - $20,350.
Grant: $432,665
Match: $20,350

Classroom Technology
Projectors, document cameras for 16 7-8th grade classrooms $1,050 per classroom, plus $900 installation cost per classroom ($1950 x 16 classrooms =$31,200); Projectors, document cameras for 16 9th grade classrooms ($1950 x 16 classrooms =$31,200).
Grant: $31,200
Match: $31,200

Non-Consumable Classroom Technology
Other non-consumable classroom technology for grades 7-9 includes digital, non-consumable math and science equipment described in Section VI: Technical Design. Total cost is estimated based on current projections about equipment needs.
Grant: $58,800

Apps & Assistive Technology/Programs
Technology management apps and assistive technology and apps will be piloted and tested by the STEM Coach and participating teachers to bring to scale. Total cost is estimated based on current projections about equipment and app needs.
Grant: $40,230

Interim Assessment
Computer adaptive interim assessment, iReady, provides teachers with actionable assessment data used to identify instructional supports or extensions needed by students.
Grant: $18,000

Digital Science Curriculum
The district's digital science curriculum, STEMscopes - the district's first digital curriculum adoption (2017-18 school year). The cost includes participating students' licenses purchased for the 4-years of the grant.
Match: $10,080

Filewave Mobile Device Management
Software tool necessary for the provisioning, inventory, deployment, tracking, and remote maintenance of the Chromebook devices. The amount prorated for the Project Chromebook devices is $2,400 annually x3 years.
Match: $7,200

Classroom Physical Space
The STEM Coach will support teachers in identifying physical space needs (e.g. flexible seating, tables, whiteboards) during the first year of the project and will scale over time. Based on an approximate cost of $3,000 per 32 classrooms, the cost to the project is $96,000.
Grant: $96,000

TOTAL GRANT: $676,895
TOTAL MATCH: $68,830

Overhead Costs

Centennial School District will apply its standard 4.9% overhead rate to Project costs.

TOTAL GRANT: $56,115
TOTAL MATCH: $59,405

ATTACHMENT A: Student Achievement Data (Section II:Public Benefit)

Chart 1: Smarter Balanced Math, Grades 7 & 8 disaggregated by race and EL status (2014-15, 2015-16, 2016-17)

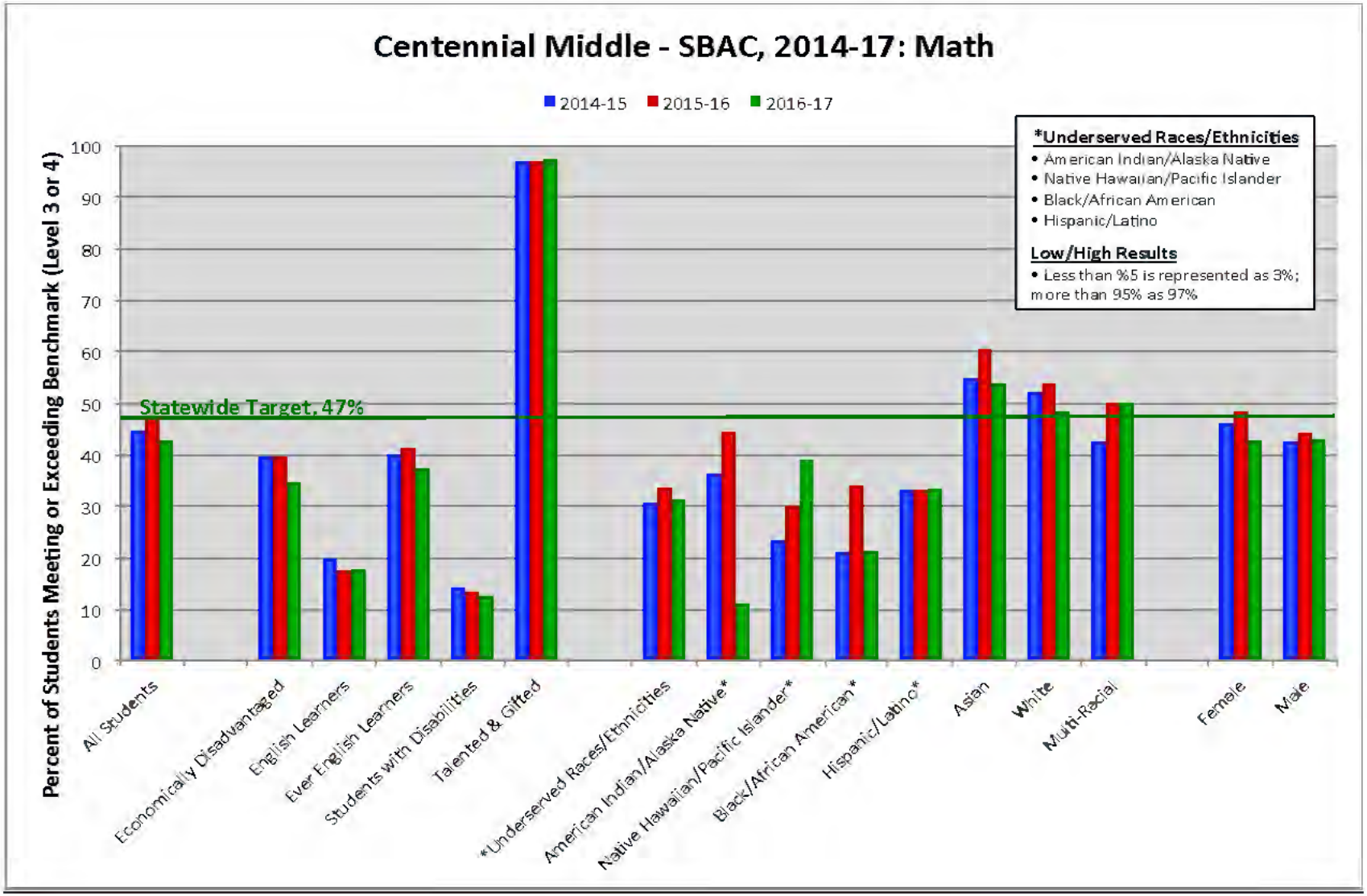


Chart 2: OAKS Grade 8 Science Achievement disaggregated by race and EL status (2014-15, 2015-16, 2016-17)

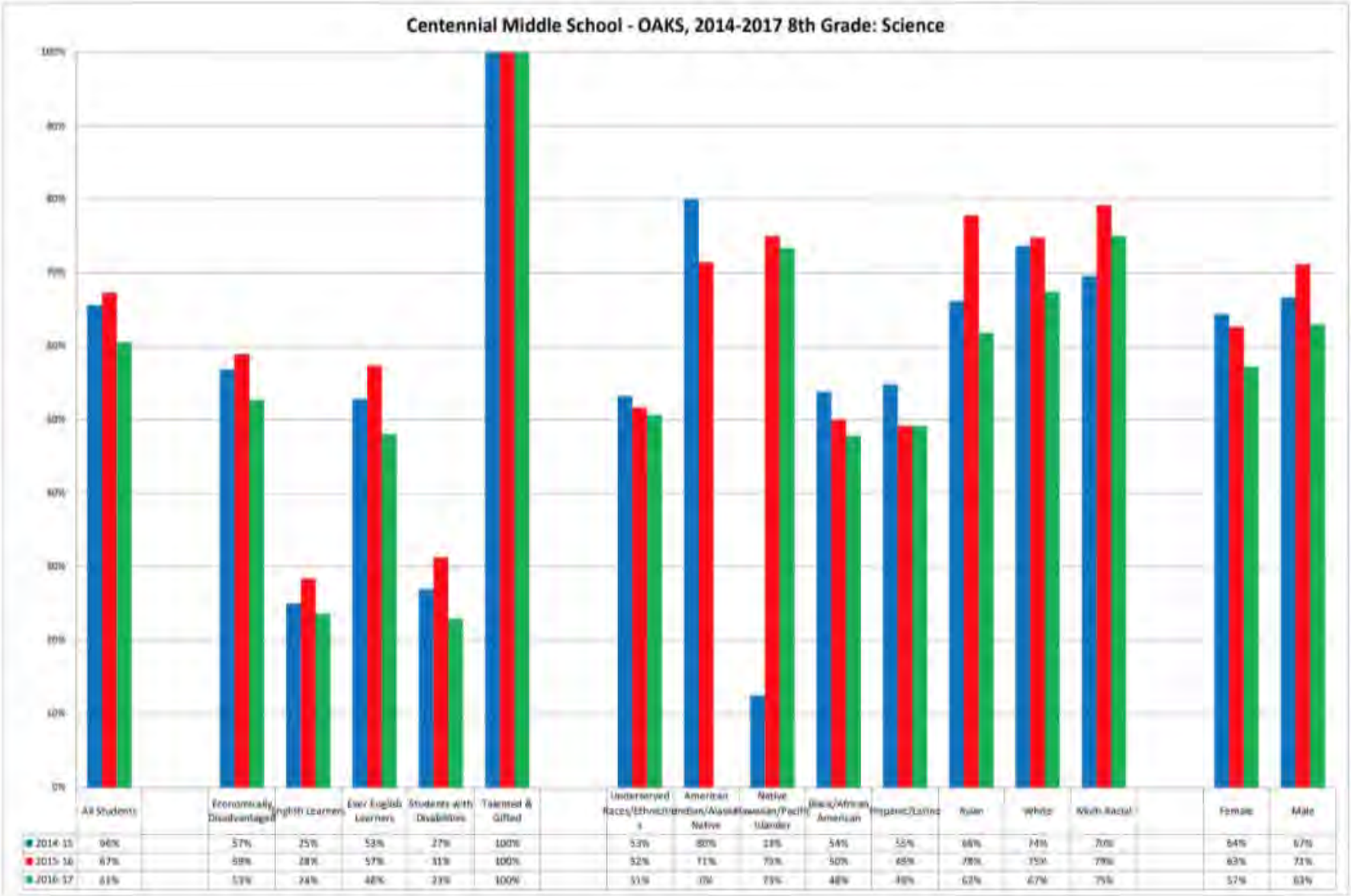
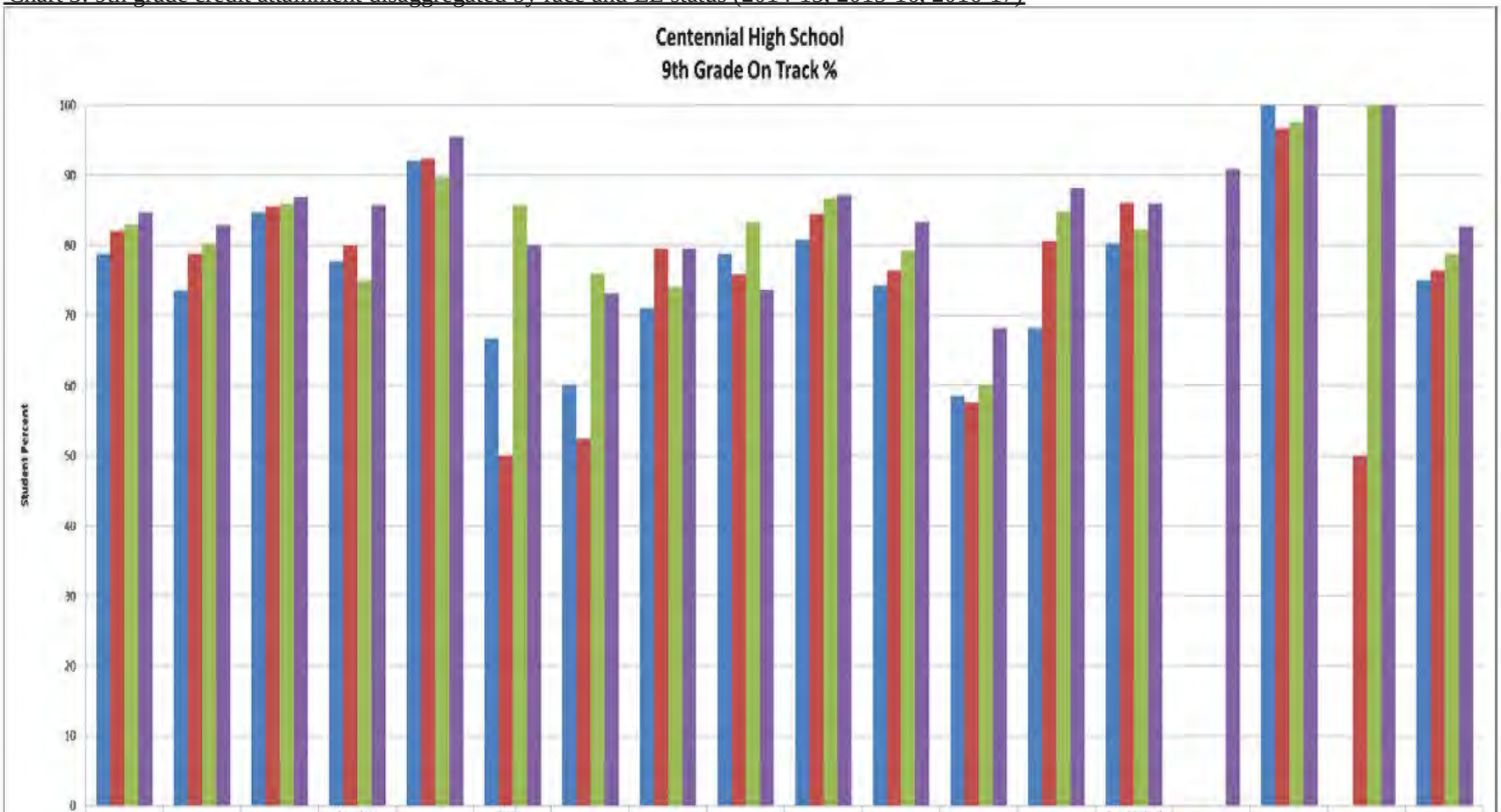


Chart 3: 9th grade credit attainment disaggregated by race and EL status (2014-15, 2015-16, 2016-17)

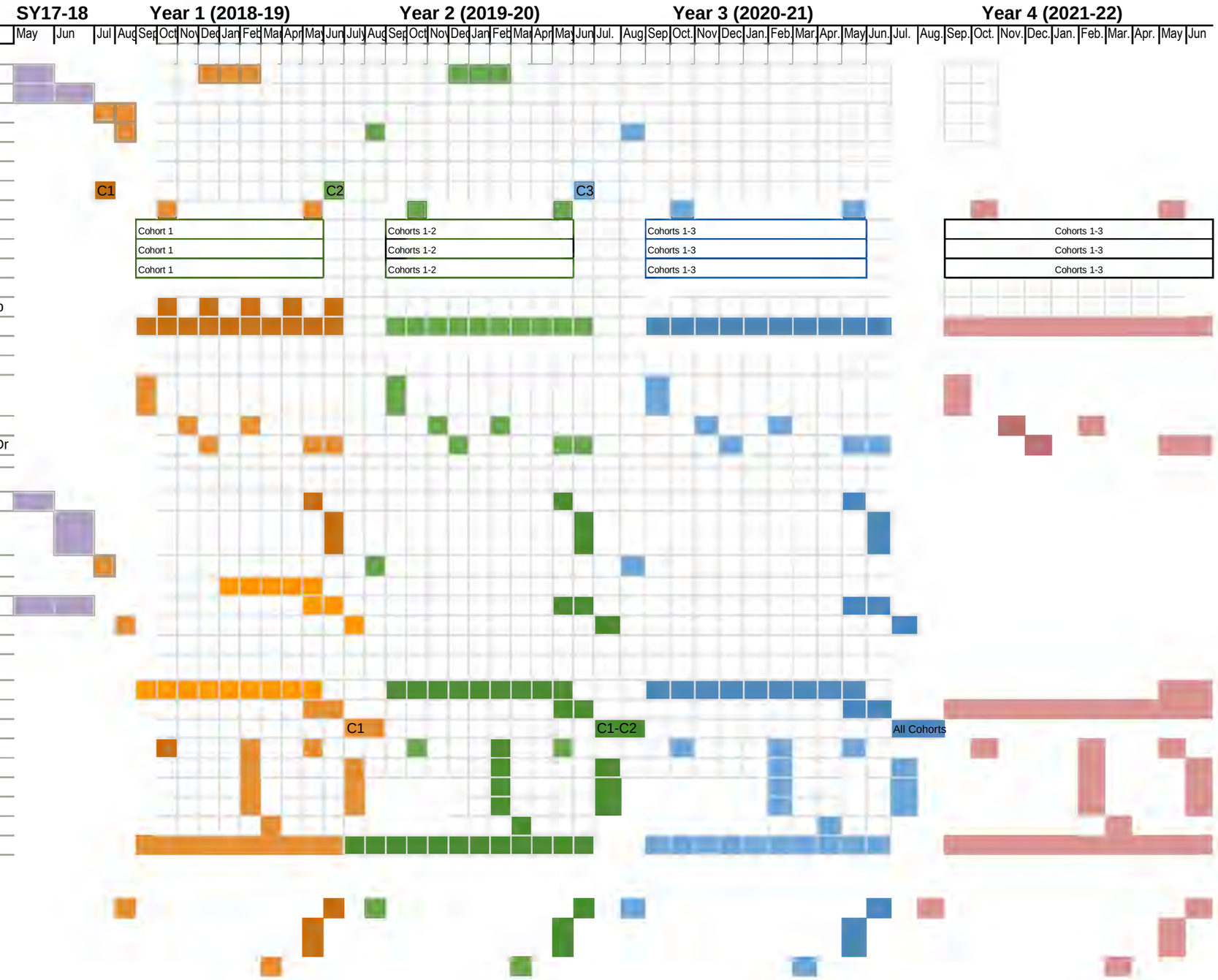


	Total	Male	Female	American Indian/Alaska Native	Asian	Native Hawaiian/Pacific Islander	Black/African American	Hispanic/Latino	Multi Racial	White	Economically Disadvantaged	Students with Disabilities	Limited English Proficient	Ever Limited English Proficient	Homeless	Talented and Gifted	Migrant	Combined Disadvantaged
2013-2014	78.8	73.6	84.7	77.8	92.1	66.7	60	71	78.8	80.8	74.3	58.5	68.2	80.3		100	0	75
2014-2015	82.1	78.8	85.5	80	92.4	50	52.4	79.5	75.9	84.5	76.4	57.6	80.6	86.1		96.7	50	76.4
2015-2016	83	80.3	86	75	89.7	85.7	76	74.1	83.3	86.7	79.2	60	84.8	82.3		97.6	100	78.8
2016-2017	84.7	82.9	86.9	85.7	95.5	80	73.1	79.5	73.7	87.2	83.3	68.2	88.2	86	90.9	100	100	82.7

Attachment 2: Project Implementation Plan

Section IV: Implementation Plan

Project Component	LEAD
Onboarding	
Identify teacher cohort for following year	Dir Curr
Identify STEM coach	Dir Curr
District onboarding for STEM coach	Dir Curr
Specialist onboarding through collaboration with participating teache	Dir Curr
Professional Development	
3-Day PBL PD: Buck Institute	Dir Curr
Teachers self-assess on BIE rubrics	STEM Coach
Lesson Study Cycles with PTs	STEM Coach
Embedded Coaching Cycles with PTs	STEM Coach
Teacher participate in grade level PLCs with specialists	STEM Coach
MESD Coaching PD for STEM and district coaches	Dir Curr
Meyer Memorial Trust: Equity/CRP professional development	Student Svcs Sup
Principal PD and Collaboration (Ad Council/CC)	Dir Curr
Family/Community Engagement	
Back to School event features family engagement around project and digital citizenship	Principals
Parent-Teacher conferences & student project showcasing	Principals
District level community newsletters	Communications Dr
Technology Management	
Order devices and charging carts	ITC
Prep devices and charging carts (device enrollment, asset tagging, inventory, wiring of carts)	ITC
Deliver devices and charging carts	ITC
Identify resources to scale (apps/physical space)	STEM Coach
Order resources (non-consumable devices, furniture, materials)	ITC
Deliver resources (non consumable devices, furniture, materials)	ITC
CSD Data Analysis and Evaluation	
Collect PD data (including hours provided, teacher surveys, observa	Dir Curr
Collect classroom observation data	Principals
Collect student summative achievement data and demographics	Dir Curr
Collect trimester interim assessment data	Dir Curr
Collect credit attainment data	Dir Curr
Collect behavior data	Dir Curr
Collect attendance data	Dir Curr
Collect student, parent, and staff perception survey data	Dir Curr
Collect sign in sheets for family engagement events	Principals
PRE Data Analysis and Evaluation	
Teacher Pre-Post Surveys	PRE
Teacher Interviews	PRE
Leadership Interviews	PRE
Student Survey (questions merged with CSD survey)	PRE



Acronyms for Lead Positions

Dir Curr: Director of Curriculum & Student Learning

OSP: Sr. Director, Office of School Performance

ITC Information Technology Center Staff

PRE- Pacific Research and Evaluation