

**EQUITABLE ACCESS TO STEM ENGAGEMENT (EASE):
PILOTING INNOVATIVE STEM LEARNING ACROSS THREE STATES
EIR GRANT NARRATIVE**

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Project Overview: This Early-Phase project, titled **Equitable Access to STEM Engagement (EASE)** is a partnership between three nonprofit organizations (Young Audiences Arts for Learning, Inc. (YAI), ArtsNOW and Young Audiences of Louisiana (YALA)) and three large school districts across three states (Georgia, Louisiana and South Carolina). **EASE seeks to address an urgent need of our nation’s young learners by supporting school communities with in-depth, customized, and arts-informed STEM curriculum alongside intensive coaching and leadership development for teachers, and by creating a national learning network for teachers and school leaders to share best practices, enhancing student learning across the country.** This project addresses **Absolute Priority 1 – Demonstrates a Rationale** (AP1), building on prior studies of arts integration as a teaching strategy which demonstrated significant benefits to students’ achievement (e.g., Bowen & Kisida, 2019; Nakamoto et al., 2015), through a two-year support model utilizing evidence-based strategies combining professional learning with job-embedded coaching (Meyers et al., 2015). EASE also addresses **Absolute Priority 3 – Promoting Equity in Student Access to STEM** (AP3) through a focus on K-5th math and science classrooms across three states, integrating the arts with core content standards including rigorous, engaging, and well-rounded (e.g., that include music and the arts) approaches to learning that will improve students’ engagement and achievement. Participating districts in this project serve populations historically underrepresented in STEM fields: predominantly students of color, many of whom are from low-income families and/or English Language Learners and are performing below grade level. Engaging interest in STEM in students’ early years of education is linked to increased likelihood of pursuing STEM careers later in life (After-School Alliance, 2015; PCAST, 2010). Throughout the project, EASE will incorporate STEM content-area support from a higher education HBCU partner, Xavier University of Louisiana (**Competitive Preference Priority (CPP) 1**) while engaging in strategies to address the impact of COVID through evidence-based instructional approaches including professional development and coaching (**Competitive Preference Priority 2**).

The five-year plan for EASE includes **scaled implementation and structured evaluation and refinement**. In 2025-26, a team of teacher leaders, arts consultants, and instructional specialists, alongside STEM content specialists from Georgia Institute of Technology and Xavier University, will

collaborate on designing exemplary STEM-focused units to be piloted and refined to align with content standards common across three states. In 2026-27, a feasibility study will be conducted at one school in each participating district; teacher leaders will pilot and refine the curriculum as they engage in monthly planning calls and quarterly coaching sessions. In addition, each district will collaborate with YA on a needs assessment examining STEM achievement and the extent to which students have become disengaged from learning (CPP2) and use this information to select additional schools for replication in the latter years of the grant. In 2027-28 and 2028-29, **an impact study will include 27 elementary schools**. The program consists of two primary activities: (1) customized, collaborative STEM curriculum development and (2) professional learning and sustained job-embedded support for classroom teachers.

A.) SIGNIFICANCE: EASE includes the demonstration of promising new strategies that build upon existing strategies.

EASE is supported by rigorous evidence of the potential for arts integration to improve student engagement and academic achievement, but there is need for research with additional content areas and student groups. Arts learning has been shown to foster social emotional development (Tarr, Launay, & Dunbar, 2014; Farrington et al, 2019) which impacts learning motivation (Shao et al., 2024), improved school attendance (Thomas, Singh, & Klopfenstein, 2015), as well as improved academic and civic engagement, in particular students from historically marginalized communities (Catterall et al., 2009). Magana and Marzano (2015) documented how the making of physical models, drawing pictures and engaging in kinesthetic representations led to greater learning and greater retention. The What Works Clearinghouse (WWC) practice guide “*Teaching Math to Young Children*” noted positive outcomes when “teachers design math activities that involve musical instruments” (Frye et al., 2013, p.39). Another WWC practice guide on elementary math suggested strong evidence to support drama strategies such as “acting out problem scenarios” or “role playing a problem” (Fuchs et al., 2021, p.5). Throughout the project, EASE will demonstrate promising strategies to support achievement as well as student and teacher engagement. Further, EASE draws upon a number of evidence-based instructional approaches. (CPP2) A recent study of an arts-infused school model in Houston, involving 36 elementary and six middle schools, was cited by WWC in 2021 as meeting standards without reservations and providing Tier 1 “strong evidence” of the

significant benefits of customized professional learning around arts integration on students' academic and social-emotional outcomes. The initiative included strategic arts planning for leaders, teacher and principal professional development, and peer mentoring sessions. Though results showed significant positive effects on student behavior, engagement and literacy, more research is needed to determine whether similar effects would occur in math and science, and whether teacher engagement is also impacted (Bowen & Kisida, 2019). Another intervention, called Arts 4 Learning (A4L), produced reliable gains in literacy. In the A4L project, Young Audiences (YA) partnered with the Beaverton School District to develop the A4L curriculum, which was designed to improve reading and writing achievement through the integration of arts into ELA via units of 10-15 lessons each. Teachers received training in implementing the units and partnered with artists who modeled activities in the classroom. Through a federal i3 grant, WestEd conducted a cluster-RCT (2011-2014) on the impact of A4L, which met WWC evidence standards without reservations (Nakamoto et al., 2015). Results revealed a positive impact on literacy skills for students in grade 4 and ELL students.

The Children's Literacy Initiative (CLI), studied by Parkinson et al. (2015), included "conducting professional development institutes and seminars to train teachers in strategies ... followed by classroom-embedded coaching to help teachers apply these strategies in the classroom" (p.2). CLI showed statistically significant positive effects on two outcomes: teacher effectiveness and classroom environment. EASE plans to build on these existing strategies by providing multi-day summer institutes and quarterly focus institutes, along with demonstrations and in-person and digital coaching sessions. CLI also provided support for school leaders "on how to leverage training to sustain high-quality instruction" (p. 5). Similarly, EASE will support district and school leaders via leadership retreats, an annual conference convening leaders from participating districts, and conducting annual needs assessments to inform professional learning (CPP2). By the time funding ends, school leaders will be well-equipped to carry the work forward and support innovative arts-integrated learning.

Overall, EASE includes key elements builds on existing strategies for professional learning outlined by Darling-Hammond et al. (2017): sustained duration, spanning two school years; active learning, utilizing a combination of delivery methods that speak to a variety of learning styles for adult learners, including

modeling and reflection; combination of coaching and expert support, using both coaches with training in math and science standards along with arts consultants offering customized, one-on-one support; and content focus, through centering on curricular standards of arts and STEM. This provides teachers an opportunity to “study a particular element of pedagogy or learning in the content area” (p.5).

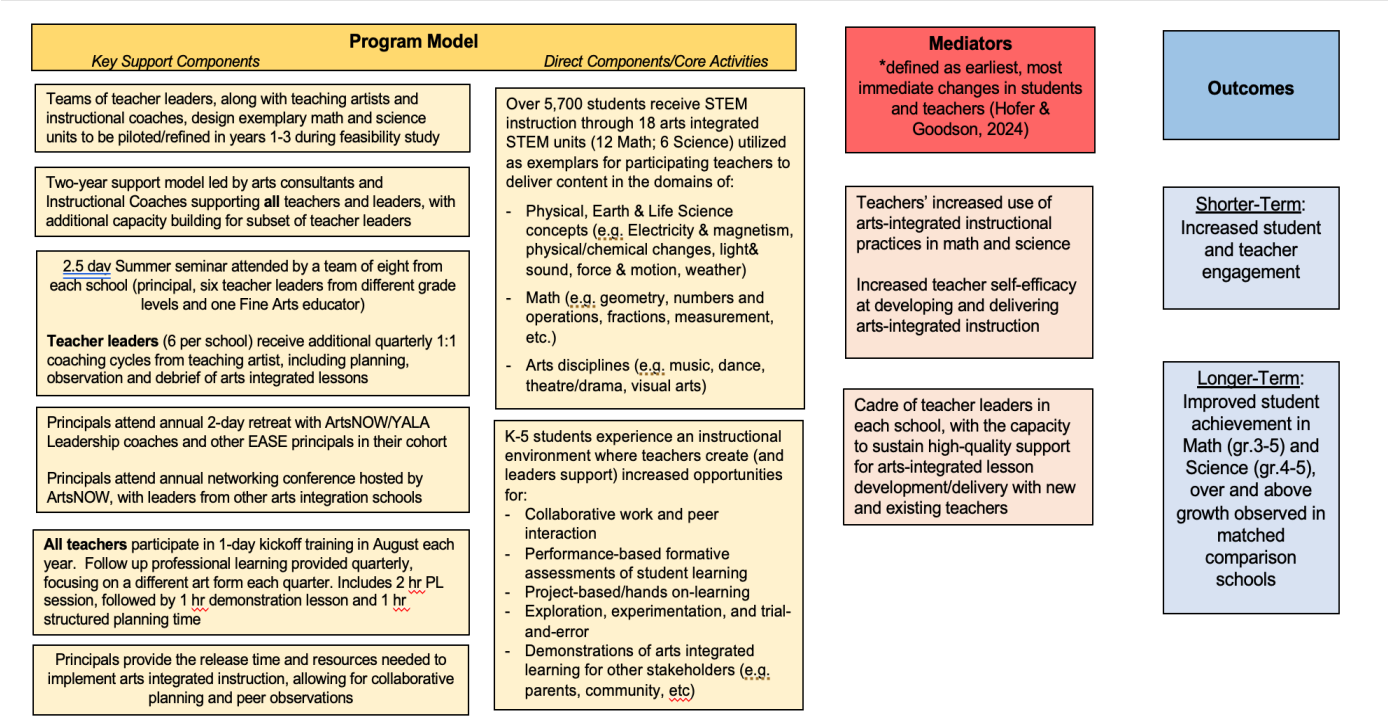
ArtsNOW, the Georgia-based affiliate of the YA network and a lead partner in EASE, has a proven track record of developing and testing arts-integrated lessons aligned with core content standards. SmART Literacy and SAIL, both federally funded Assistance for Arts Education grants from the U.S. Department of Education, demonstrated benefits to teachers and students. In SmART Literacy, less than 10% of teachers reported being “highly confident” integrating the arts at baseline, but this percentage grew to 24.7% after multiple years of professional learning and job-embedded support from ArtsNOW. The two schools showing the largest gains in ELA proficiency were the same two schools showing the largest gain in teachers’ confidence with arts integration and the most frequent use, with 80% or more of teachers using arts integration strategies at least weekly. Overall, teachers’ effectiveness ratings increased significantly from pre to post ($p=.015$). SAIL developed customized, inquiry-based arts-integrated STEM activities to support students’ critical thinking skills and math and science achievement (Dell’Erba & Water, 2024). After just one year of implementation, evaluation revealed the SAIL schools’ 5th grade science achievement in 2023 was significantly higher than matched comparison schools (Mollette, 2023). A similar trend was observed in math achievement, with SAIL 5th graders significantly outperforming comparison schools by a narrow margin. It is important to study the extent to which EASE will have a similar impact across the three high-need districts and whether integrated lessons can feasibly be adapted to align across multiple state standards. Pairing curriculum development with the feasibility study allows for classroom-tested perspectives on components of each STEM unit; this crucial feedback will inform the units’ revision. After the feasibility study, expanding to new schools in the three participating districts will allow the project to conduct a rigorous cluster-QED in an authentic setting, designed to meet the WWC standards with reservations. This can potentially contribute a significant amount of knowledge to the field related to the impact of delivering integrated units that support student achievement and engagement. Woven throughout

our project design is a plan to demonstrate promising instructional strategies that are alternatives to traditional, passive learning often seen in elementary classrooms.

B.) PROJECT DESIGN

The conceptual framework below outlines key components, professional learning activities and expected mediators and outcomes (full-size version in Appendix G).

B1) EASE Conceptual Framework:



Context: National Young Audiences works with two regional affiliates to recruit 9 high-need elementary schools across three districts (two suburban, one midsize city) in Georgia, Louisiana and South Carolina. Variations in state and local policies, as well as potential leader and teacher turnover could moderate the impact of the intervention.
Target student groups: Elementary students who are from low-income families, and/or are English Learners, performing below grade level, or from groups underrepresented in STEM
Evidence base: Bowen & Kisida (2019); Nakamoto, et al (2015); Mollette, et al. (2024); Darling-Hammond et al. (2017); Brandt et al. (2013); Allensworth & Hart (2018); Meyers et al. (2015)

Sharing in the design and implementation of EASE are three organizations with demonstrated records of providing high-quality professional development (YAI, ArtsNOW, and YALA) and three school districts serving high-need populations: Richmond County (GA), Jefferson Parish (LA), and Greenville County (SC). As noted in the graphic above, EASE includes key support components for both teachers and leaders focused on increasing student access to the arts. As described in the previous section, this framework is supported by several prior studies of the potential benefits of arts integration (AP1). The model underlying our training plan is a similar evidence-based approach used in eMINTS. Similar to what we are planning

for EASE, eMINTS helped teachers improve their practice (in technology integration) by offering *structured professional development, coaching, and support* for implementation (WWC, 2020), which showed significant positive effects on students' math achievement in grades 4-8, considered Tier 1 evidence, meeting WWC standards without reservations (Meyers et al., 2015). EASE will study whether this model can have a similar impact when the approach is arts integration. ArtsNOW and YALA arts consultants will be supporting teachers in using the arts to implement high-quality, inquiry-based learning, in which students develop understanding and knowledge of STEM content and arts standards by engaging in creative projects. Section A listed numerous studies showing promising evidence of arts integration improving academic outcomes. Collectively, **these studies reflect a body of knowledge that can be extended through EASE's focus on math and science as the core content areas (AP3)** for a research-based professional development structure emphasizing arts integration and inquiry-based learning.

The table below describes our two-year professional learning plan.

Professional Development	Focus Areas	Time	Participants
Comprehensive Summer Institute	EASE lead teachers: Knowledge Acquisition <ul style="list-style-type: none"> ○ Introduction and roles of partners (YAI, school/district administrators, ArtsNOW, YALA) ○ Goals, expectations, outcomes, and format of the project ○ Preparing the Class of 2034: The Impact of a Quality STEM Education on Their Future ○ Using arts integrated lessons for STEM instruction 	20 hours	54 lead teachers (6 per school) Principals
Kickoff event (August)	All teachers: Knowledge Acquisition <ul style="list-style-type: none"> ○ EASE lead teachers guide colleagues through sessions outlining use of various art forms ○ Goals, expectations, outcomes, and format of the project 	8 hours	All teachers at each school
Principals retreat (annual)	Principals of participating schools <ul style="list-style-type: none"> ○ Arts consultants – review effective practices for supporting teachers' use of arts integration ○ Goals, expectations, outcomes, and format of the project, planning for the upcoming year ○ Reflections from previous year, discussion of barriers and facilitators experienced, review evaluation data and training artifacts 	16 hours	All principals
Digital coaching cycle (Quarterly, virtual)	EASE lead teachers: Application <ul style="list-style-type: none"> ○ Planning session with ArtsNOW/YALA consultants, designing arts integrated lesson (30 min) ○ Record delivery of arts integrated lesson with students. ○ Debrief with ArtsNOW/YALA consultants, collaboratively reviewing video and providing constructive feedback. (1 hr) 	8 hours	54 lead teachers (6 per school)
Quarterly Focus Sessions (2 hours each, in person)	All teachers: Knowledge Acquisition <ul style="list-style-type: none"> ○ Analyzing lessons integrating arts standards with content standards specific to each grade level. Led by ArtsNOW/YALA staff and consultants. Each institute focuses on a specific art form for the day 	8 hours	All teachers at each school (54 of whom are serving as teacher leaders)

	<ul style="list-style-type: none"> Using Lesson Study to support STEM Instruction All teachers from a specific grade level in each district attend together to support partnerships between schools 			
Lesson Modeling (Quarterly, 1 hr each, in person)	All teachers: Application <ul style="list-style-type: none"> After participating in the quarterly follow-up session focused on a specific art form (different one each quarter), arts consultants will spend a full day at each school rotating through the grade levels demonstrating use of the strategies learned at the PL session. This provides proximal opportunities for observation to deepen teacher learning soon after the PL 	4 hours	All teachers at each school	
Structured Lesson Planning (Quarterly, 45 min each, in person)	All non-lead teachers: Knowledge Acquisition <ul style="list-style-type: none"> Follow-up: Designing arts integrated lessons 	EASE lead teachers: Knowledge Acquisition <ul style="list-style-type: none"> Follow-up: Using Content-Based Coaching Practices to support other teachers in grade level 	3 hours	All teachers at each school
Summer Design Institute 2025 and 2026	EASE lead teachers: Design of integrated lessons <ul style="list-style-type: none"> Growing teacher self-efficacy for sustained success; strategies for effective coaching Create two units (one math & one science) for each grade level (four additional units created in summer 2024) Collaborate with Georgia Tech and Xavier Univ content specialists to design integrated lessons (at least 6-8 per unit) to be piloted in 2026-27 school year, refined based on feedback, and used in impact study 	16 hours	Pilot lead teachers, content experts from Georgia Tech and Xavier University, arts consultants from ArtsNOW and YALA	

B2) The goals, objectives and outcomes for EASE are clearly specified and measurable.

The primary focus of this project is to develop and test the use of a set of arts-integrated STEM units that are: aligned with the grade-level content standards for math and science, supported by standards in the arts, and incorporate inquiry-based activities to support the development of students' critical thinking. Through job-embedded coaching and modeling (CPP2), teachers will practice arts integration with support from an arts consultant, a structure with the potential to impact teacher practice (Schlaack & Steele, 2018). Project goals, objectives, and outcomes are outlined below.

Objectives	Outcome Measures
Goal 1: RESOURCE DEVELOPMENT. Develop, refine and implement integrated STEM units designed to improve achievement through the delivery of content that integrates various art forms.	
Obj 1.1: Create a core development team to conduct cross-state curriculum mapping, unit refinement, and lesson planning	<u>Measure 1.1:</u> By the end of Year 1, develop a crosswalk for each grade level (in each state) that demonstrate the connections between arts and math/science standards <u>Measure 1.1b:</u> By year 3, development of 18 arts integrated units (12 math, 6 science) aligned with K-5 standards in three states
Obj 1.2: Build capacity of teacher leaders to incorporate arts integration strategies, along with effective peer mentoring practices	<u>Measure 1.2a:</u> 85% of teacher leaders will agree the professional learning and coaching is of high-quality and value to their pedagogy

	<u>Measure 1.2b</u> : Teachers leaders' self-efficacy with delivering arts integrated instruction will increase 20% from pre to post survey
Obj. 1.3: Expand the capacity of YAI affiliates to replicate ArtsNOW's two-year prof'l learning model in pilot schools	<u>Measure 1.3</u> : YALA will receive 224 hours of support over two years (i.e. quarterly site visits and monthly coaching sessions with ArtsNOW leaders) focused on effectively delivering a multi-year PL model
Obj 1.4: Conduct feasibility study in pilot schools (2026-27), including support for classroom teachers, virtual planning sessions and coaching cycles for teacher leaders	<u>Measure 1.4a</u> : Survey data will indicate 80% of teachers piloting units agree they were adequately prepared and supported <u>Measure 1.4b</u> : 80% of teachers agree students benefited from the delivery of arts integrated STEM units
Goal 2: PROFESSIONAL LEARNING MODEL. Build the capacity of teachers and leaders to implement and sustain arts integrated instruction in math and science across grades K-5.	
Obj. 2.1: Prepare six teacher leaders per school with effective peer mentoring skills to support colleagues with planning and delivery of integrated learning, serving as a model/ demonstration classroom	<u>Measure 2.1a</u> : 80% of classroom teachers will agree their teacher leader provided adequate support for arts integrated learning <u>Measure 2.1b</u> : Teacher leaders will improve by 10% from pre to post on the <i>Teacher Leader Readiness survey</i> (Finster, 2016)
Obj. 2.2: Provide leadership support to principals , enabling them to create conditions that support, promote and sustain arts integrated learning.	<u>Measure 2.2a</u> : 80% of teachers will report that their school leaders are supportive of integrated learning <u>Measure 2.2b</u> : Leaders demonstrate significant improvement from pre to post on <i>Implementation Leadership Scale</i> (Lyon, 2018)
Obj. 2.3: Build the capacity of classroom teachers to plan and deliver engaging, arts integrated math and science lessons, increasing their enjoyment of teaching	<u>Measure 2.3a</u> : By 2028-29, teachers will deliver an average of 10 arts integrated lessons per month. <u>Measure 2.3b</u> : By the end of the grant, 70% of teachers progress to Stage 3 on the <i>Arts Integration Rubric</i> (Brophy, 2011) <u>Measure 2.3c</u> : Scores on <i>Educator Engagement Survey</i> (AIR, 2020) increase 10% from pre (2027) to post (2029)
Obj. 2.4: Students participate in inquiry-based math and science lessons integrating various art forms, collectively covering a majority of the content standards for their grade level	<u>Measure 2.4a</u> : In 2029, treatment students will significantly outperform control students on the 3 rd -5 th grade math tests <u>Measure 2.4b</u> : In 2029, treatment students will significantly outperform control students on 4 th and 5 th grade science tests <u>Measure 2.4c</u> : Scores on <i>Student Engagement Check-in Tool</i> will increase 20% from baseline/pre (2027) to post (2029)

B3) EASE is appropriate to, and will successfully address, the needs of the target population.

The table below provides enrollment and demographic details on the target population for this project, which includes elementary schools across districts in three states. Over half of the students in Greenville County, and over 3/4 of students in Jefferson Parish and Richmond County, come from

economically disadvantaged households. In addition, 1 in 5 students in Jefferson Parish is considered an English Language Learner (ELL). Greenville County has six elementary schools with 20%-39% ELL students, and seven schools with greater than 40% ELL students.

Partner districts (state)	# of schools serving K-5	# of schools underperforming in Math and Science (high-need)	% FRL (2023)	% ELL	% students of color
Richmond County (GA)	32	28	82	2.6	87.4
Greenville County (SC)	51	12	56.7	16.4	51
Jefferson Parish (LA)	51	35	77.6	21	78.8

*FRL – eligible for free/reduced lunch

Partner districts (state)	Avg # of teachers per elementary school	Avg # of students per school
Richmond County (GA)	35	476
Greenville County (SC)	50	708
Jefferson Parish (LA)	32	481

Through close collaboration with each partner district, as well as a review of relevant literature, we have identified **three key needs that will be addressed through this project**: (1) Lack of job-embedded coaching and professional learning to support teacher engagement; (2) Below average student achievement in math and science for high-need schools in three districts (see letters of support in Appendix C); and (3) Lack of access to arts programming for students in high-need schools.

Need #1: Lack of job-embedded coaching and professional learning to support teacher engagement.

Arts integration is a learned skill, even for teachers who are naturally talented in the arts. The pedagogical practice of integrating art and STEM content simultaneously requires educators to be skilled in identifying and demonstrating content area connections, while developing confidence in their ability to instruct through the arts. ArtsNOW and YALA have found that the approach of placing arts consultants in classrooms to co-teach and model strategies in a collaborative coaching model addresses the two largest obstacles many educators cite as their reluctance to incorporate the arts as an engagement strategy into their daily lessons: the perception that they do not have artistic talent and the reality that most do not have formal arts training. “Modeling has been found to be a highly effective way to introduce a new concept and help teachers understand a new practice,” (Gulamhussein, 2013). Hill (2020) pointed out that, while rare, “structured coaching” boosts teachers’ practice and increases students’ performance. EASE also includes collaborative

reflection sessions for teachers as they are delivering the integrated units and working with the arts consultants, who serve as instructional coaches to analyze their practice and look for areas to improve. A cluster-RCT conducted by Roth et al. (2018) showed an “analysis-of-practice” PD program “significantly impacted teachers’ knowledge and practice”. “Many teachers express the desire to learn fresh ways to teach that excite the creativity in their students and revitalize the creativity of teaching for themselves ... teachers find that arts integration does both,” (Duma & Silverstein, 2019).

EASE’s integrated STEM units, in addition to lessons co-developed by teachers and leaders throughout the two-year intervention, will collectively represent a majority of the content standards for each grade level. Implementation will be supported by 46 hours of professional development offered to all teachers over a 2-year period, with 102 hours for teacher leaders (46 hours plus 56 hours of job-embedded support and professional learning). Teacher leaders will, in turn, provide additional job-embedded support to other classroom teachers. Principals will also receive 72 hours of strategic planning and implementation leadership support. See Section B for detailed professional learning and coaching plan.

Need #2: Below-average achievement in math and science and large performance gaps. The long tail of learning loss following the COVID-19 pandemic continues to impact student achievement (CPP2). The most recent data from the National Assessment of Educational Progress shows the lowest achievement in math and literacy in decades and a significant decline since 2020, the first drop in math scores since testing began. The scoring gap in math between fourth-grade white students and students of color increased from 2020; the gap between white and Black students in particular grew from 25 to 33 points. Young and Young (2024) shared aligned findings, indicating that students from schools serving historically marginalized populations (lower socioeconomic status and communities of color) showed academic performance below pre-COVID levels. Additionally, they found that the youngest learners, who were not yet in kindergarten when the pandemic began, experienced less academic recovery since 2020 than older students and have fallen further behind.

Across the three partner districts, dozens of schools are underperforming in math and/or science. Specifically, in Richmond County, virtually *all* elementary schools are performing well below state

averages in math and science. Similarly, in Jefferson Parish most schools are performing below state averages. Even in Greenville County, where overall district achievement is above state averages, in 12 of its 51 elementary schools less than half of the students are proficient in math, and seven schools had 2023 science scores well below state averages. Further, large achievement gaps of 23-46 percentage points persist in all three districts between economically disadvantaged students and their more affluent peers, with the largest achievement gaps occurring in Richmond County.

Partner districts (state)	% proficient math	% proficient science	% FRL proficient in math	% non-FRL proficient in math	<i>Poverty-based gaps</i>
Richmond County (GA)	17.4%	17.8%	16.6	63.2	46.6
Greenville County (SC)	59.8%	60.2%	45.8	78.2	32.4
Jefferson Parish (LA)	29.4%	24.6%	23	46	23

**state averages – GA = 42.8% math and 40% science; SC=41% math and 47% sci; LA=31.3% math and 28% Sci*

In addition, Greenville and Jefferson Parish have several schools with relatively high percentages of English Language Learners who are underperforming relative to state and district averages. For example, of the ELLs in Jefferson Parish, only 11% were proficient or higher in math and 6% were proficient or higher in science in 2023. Similarly, less than 1/3 of the ELLs in Greenville County were proficient in math in 2023. In all three states, NAEP 4th grade math scores declined from 2019 to 2022, with poverty-based achievement gaps ranging from 23 to 28 percentage points within those scoring below basic on 4th grade math. As outlined elsewhere in the proposal, EASE is grounded in evidence demonstrating the promise of arts integrated learning and its ability to address the need to improve student achievement in math and science, as well as close achievement gaps. The goal is to create interdisciplinary lessons focused on a math and/or science topic, supported by curricular standards in the arts, as well as opportunities for students to develop problem-solving skills through the meaningful integration of various art forms (see Appendix J for sample alignment of standards).

Need #3: Lack of access to arts-integrated programming for students in high-need schools. When Congress passed the Every Student Succeeds Act (ESSA) in 2015, they called for states to provide a “well-rounded education” defined as one that “includes a wide variety of subjects – such as music, the arts” (Jones & Workman, 2016). The NIA for the EIR grant program suggests that under AP3, innovations can include

“engaging, and well-rounded (e.g. that include music and the arts) approaches to learning”. Yet, Robinson (2013) argues the availability of arts education has diminished significantly, especially for economically disadvantaged students. On the 2016 NAEP Arts Assessment, students from lower-income families scored 22 points lower in visual arts than students with a higher socioeconomic status, indicating inequities in student access to high quality arts education. The schools targeted by EASE have indicated a desire to support the arts, but also a serious lack of funding for arts programming, likely to be exacerbated in the coming years due to revenue shortfalls. van Broekhoven et al. (2020) found that features central to creativity, though often developed through arts engagement, are foundational to STEM studies. Despite the importance of developing students’ creativity, Dai et al. (2012) provided evidence for a “creativity gap” between students from higher and lower socioeconomic backgrounds (p. 191). This project supports increased access to the arts by providing teachers with professional development focused on arts integration that seamlessly integrates national arts standards with state math and science standards, while increasing the efficiency with which they use experiential, inquiry-based learning to expose students to both the arts and STEM content and activate creativity along the way (see Appendix J for examples of arts-integrated lessons across various STEM topics).

C.) QUALIFICATIONS OF KEY PERSONNEL

Below are brief bios of key project personnel; resumes of these and additional supporting staff members dedicating time to the project may be found in Appendix B, along with sample qualifications of arts and instructional consultants as well as expectations for the role of teacher leaders. YAI actively recruits from a broad array of community networks and higher education partners in order to engage participation from historically underrepresented groups. A detailed description of YAI’s equity-centered hiring practices is located in Appendix B.

<p>Co-Project Director: [REDACTED] (YAI)</p>	<p>[REDACTED] was appointed National Executive Director of YAI in 2010. Prior to this, he served as the Managing Director of the Metropolitan Opera Guild, having also served as the Guild’s Director of Education. He currently provides fiscal oversight as Project Director for a national AAE grant from the U.S. DOE and will fulfill this role for EASE. [REDACTED] serves on the Leadership Team of the National Coalition for Core Arts Standards, Board of Directors for the Music-in-Education National Consortium, the Advisory Committee of the Arts</p>
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	<p>Education Partnership and is a member of the Harvard Graduate School of Education Arts in Education Advisory Council.</p>
<p>Co-Project Director: [REDACTED] [REDACTED] (ArtsNOW)</p>	<p>[REDACTED] has been CEO of ArtsNOW since 2010 and during that time has led several large state and federal grant projects, collaborating with dozens of school and district leaders. She is distinguished for her extensive expertise in organizational planning, educational leadership, and arts integration. With a background spanning roles as a teacher, administrator, and district-level leader, she brings practical insight and strategic vision to her work. Formerly the Director of Enterprise Education at the Woodruff Arts Center, she has contributed as an independent consultant and speaker, nationally and internationally. She began her career as a music teacher in 1990 and has focused her 30-year career in education on developing authentic arts integration strategies supporting high-quality instructional practices.</p>
<p>Implementation Director: [REDACTED] [REDACTED] (ArtsNOW)</p>	<p>[REDACTED] brings a wealth of experience and expertise from her distinguished career in educational leadership, with a strong focus on STEAM education. With 17 years of experience in school and district-level leadership, [REDACTED] has driven forward-thinking strategies in curriculum development and instructional practices. In addition to 8 yrs as an elementary school principal, she spent 8 years as a 3rd grade teacher, 3 yrs as an elementary school assistant principal, and 3 yrs in a leadership position at the central (district) office. Within each leadership position, [REDACTED] conducted professional development with teachers and administrative teams. She was responsible for keeping all audiences informed of current best practices in teaching, teacher evaluation, district initiatives, and curriculum designs. As Executive Vice President and Chief Operating Officer of ArtsNOW, [REDACTED] continues to empower educators and students, driving positive change through arts integration and educational excellence. She serves on the advisory board for Georgia Tech’s Center for Education Integrating Science, Math, and Computing (CEISM) and has refereed proposals for the STEAM conference at Georgia Tech.</p>
<p>Senior Project Manager: [REDACTED] [REDACTED] (YAI)</p>	<p>[REDACTED] serves as the Director of Strategic Partnerships & Network Relations at YAI. In this role she leads the development and implementation of national programs within the Young Audiences network, including management of the US DOE AAE grant that concludes in 2026. Prior to this, she oversaw school programs at Lincoln Center, where she created an initiative that studied the impact of arts integration in underfunded, low-arts middle schools. She teaches a graduate course for arts educators at NYU called Drama for Special Populations centered on equity and disability justice.</p>
<p>Regional Project Manager (Louisiana): [REDACTED]</p>	<p>[REDACTED] has worked at YALA since 2008 and currently serves as Executive Director. She has designed and implemented innovative programming and community partnerships to meet the needs of children and families and has brought over 7 million dollars of grant funding from the U.S. DOE. She has presented on arts integration, literacy, STEM, community engagement and early childhood education at several national and local conferences. [REDACTED] has completed the IEL’s Education Policy Fellowship Program and the Bryan Bell Metropolitan Leadership Forum.</p>

Regional Project Manager (Georgia): [REDACTED]	[REDACTED] serves as a Project Manager out of ArtsNOW’s Savannah office. A seasoned educator, she has held roles as a grant liaison and STEAM coordinator and as an Extended Learning Coordinator and currently coordinates all STEAM programming for ArtsNOW, partnering with Georgia Tech’s CEISMC. [REDACTED] holds a Master’s in Early Childhood Education from Georgia Southern University and an Ed.S. from Nova Southeastern.
Regional Project Manager (South Carolina): [REDACTED]	[REDACTED] is a project manager for ArtsNOW. Throughout his 20 years in public education, he has served as a dance educator, arts integration instructional coach, arts grant manager, and district coordinator of performing and fine arts. In these roles, he helped to lead STEAM and arts integration initiatives through leading professional development and collaborating with teachers on creating integrated lessons. He currently serves on the board of directors for Palmetto State Arts Education.
Evaluation Team	The external evaluation team bios and resumes are provided in Appendix B. They include former practitioners with extensive experience studying instructional interventions. In addition, the lead evaluator is certified in WWC’s group design evidence standards. All have a demonstrated record of conducting rigorous research for federal US DOE grants and disseminating findings to research and practitioner audiences.
National Project Coordinator: TBD	Young Audiences is hiring a Program Coordinator to support YAI initiatives, including the EASE program. YAI is prioritizing the recruitment and hiring of an individual who identifies within a community that has been historically under-represented in nonprofit administration. Modeled after best practices shared by ArtEquity, a national nonprofit providing training for social change, job listing, and equity-centered hiring practices are in Appendix B.

About ArtsNOW: ArtsNOW provides professional learning opportunities, workshops and resources on arts and arts integration. This project builds on ArtsNOW’s previous work with school districts in Georgia and South Carolina. A list of multiple previous U.S. DOE grants led by ArtsNOW is provided in Appendix J, highlighting strong organizational capacity to support this work.

About Young Audiences of Louisiana: YALA has established expertise in customized, in-depth school partnership and teacher professional development. YALA established the Young Audiences Charter School, the only fully arts-integrated public charter school in the Greater New Orleans area, which integrates the arts across all subject areas, including STEM. YALA has been the recipient of four Department of Education grants (two PDAE grants, AAEDD in 2018, and American History and Civics in 2023) and serves as Lead Instructional Specialist for the current AAE grant managed by YAI.

About the Young Audiences network and headquarters: As the country’s oldest and largest arts in education network of roughly 30 affiliate organizations across 21 states, Young Audiences collectively serves nearly 5,000,000 children annually. The network is committed to providing youth with high-quality

learning experiences that foster creativity while illuminating academic learning. Young Audiences Arts for Learning, Inc. (YAI), the national headquarters of the network, supports, disseminates, and builds upon network best practices through projects and research to provide maximum impact on student achievement across the nation. In 2021 YAI received a five-year AAE grant from the US DOE to develop culturally responsive practices in arts consultants across 18 cities. YAI works in close communication with affiliates who have received several US DOE grants in recent years, including two who received grants from EIR.

D.) QUALITY OF THE MANAGEMENT PLAN

Management Structure: Overall administrative management will be guided by the Project Co-directors in collaboration with an Implementation Director (e.g. Asst Project Director) overseeing the work of three regional Project Managers (one per state). The Senior Project Manager will manage communications and logistics across stakeholders: the partnering organizations, STEM and arts consultants, and the program evaluation team. Regional Project Managers will oversee local implementation and communication with school administration and teacher leaders, and they will consult on professional learning content, recommended program design, and instructional materials. A chart detailing individual roles and responsibilities of YAI, ArtsNOW, YALA, and the key project stakeholders is in Appendix J.

Core Development Team: The project will begin by gathering a core development team in Spring 2025 who will be responsible for developing new, or refining existing, STEM units that integrate arts engagement strategies. This core development team will consist of 12 teacher leaders at two veteran school partners of ArtsNOW (one teacher per grade per school) and two from YALA. Collaborating with them will be ArtsNOW and YALA arts consultants and STEM content experts from Georgia Tech and Xavier University (CPP1). Together they will develop two math units per grade level for grades K-5 and two science units per grade for grades 3-5. The content generated in the planning, development, and design phase will be implemented during the feasibility study in 2026. Based on feedback and observations, additional revisions will be made in the summer of 2027, prior to these units' implementation during the impact study in 2027-28 and 2028-29 school years. As described further in Section E2, effective communication and coordination of the partners will be ensured through monthly check-in meetings including the ArtsNOW, YALA and YAI management teams, regional project managers/instructional coaches, and the external evaluation team;

the evaluator will also provide quarterly progress reports to all project implementation staff that include any issues requiring attention. The external evaluation team will remain separated from the implementation design and control to maintain the utmost objectivity in the research.

Fiscal oversight: Effective control of the project’s expenditures will be maintained through a detailed work plan, project budget, systematic reviews of actual performance against those plans and the ability to adjust the plan and budget as required. ArtsNOW and YALA will track local consultant contracts and expenditures, reporting these to YAI quarterly. YAI (co-project director [REDACTED]) will oversee overall project budgeting and expenditures and will oversee contracts with project-wide consultants such as the external evaluation team, identifying deliverables, timelines, and reporting responsibilities to effectively manage all project-related costs. ArtsNOW’s President and CEO [REDACTED] (co-project director) will have primary responsibility for building and maintaining relationships with district leaders and advise recruitment/onboarding process for scale-up schools in the latter part of the grant. She will provide fiscal oversight for the schools involved and prepare regular updates to YAI’s and ArtsNOW’s governing boards, incorporating their feedback into project implementation and data collection. Project stages are outlined below.

Timeline	Study Component	Description	Lead Partner
Spring 2025	Planning	<ul style="list-style-type: none"> • YAI, ArtsNOW and YALA will meet semi-monthly to plan project activities, secure MOUs, hire personnel specific to the project, etc. • Curriculum mapping, creating crosswalk between math/science standards in GA, SC and LA. Select content for units, common to all three states 	YAI
School Year 2025-26	Content Design and Development	<ul style="list-style-type: none"> • Core development team works to develop/refine 18 arts integrated units (12 math/6 science) • Teacher leaders from two pilot schools participate in digital coaching with ArtsNOW instructional coaches • YALA education team participates in observations, demonstrations and collaboration with ArtsNOW related to the multi-year professional learning model 	ArtsNOW
School Year 2026-27	Feasibility Study	<ul style="list-style-type: none"> • Pilot schools’ teachers deliver arts integrated units and provide feedback on usability and feasibility, with refinements based on feedback • Teacher leaders in each pilot school support grade level colleagues to deliver the units • Virtual planning sessions held monthly to assist with just-in-time support for arts integrated instruction 	ArtsNOW

		<ul style="list-style-type: none"> Digital coaching cycles for ArtsNOW and YALA teacher leaders to build capacity to support arts integration 	
School Years 2027-28 & 2028-29	Impact study (see detail in Section E)	<ul style="list-style-type: none"> Nine schools (3 per state) participate in a two-year professional learning model, including monthly touchpoints with ArtsNOW/YALA project staff. All teachers receive at least 46 hours of prof'l learning. Six schools per state selected as comparison sites Six teacher leaders per school and each principal receive additional support in the form of digital coaching, retreats, and networking with other leaders to build capacity 	YAI, ArtsNOW, YALA
Fall 2029	Dissemination & reporting	<ul style="list-style-type: none"> Data from impact study is compiled and summarized. Final report is prepared Principals retreat to review outcomes and plan for sustainability 	Evaluation team

Timeline, Milestones, and Responsible Parties: The table below provides key activities, timelines, and lead partner(s) responsible, indicating alignment between activities and objectives specified in Section B. The initial rows pertain to the design and development conducted during the first 18 months of the grant period, with the remaining milestones provided in **Appendix J – Management Plan addendum**.

YEAR 1-2: PLANNING, CURRICULUM DEVELOPMENT & TRAINING January 1, 2025 through June 1, 2026			
Major Activities	Benchmarks	Timeline	Person(s) responsible
Refine work plan, timeline with partner districts	Convene meetings with all project partners and develop a final set of project goals/objectives, as well as a scope of work delineating each partner’s commitment and responsibility.	January 2025	All
Develop MOUs between YA, higher ed and research partners, and partner districts (Obj 1.1)	Establish protocols for communications, responsibilities, and budgeting for partners including: YALA, ArtsNOW, GA Tech, Xavier Univ, Greenville and Richmond County Schools, Jefferson Parish Schools, and external evaluator	February 2025	██████████ & ██████████, Co-Project Directors, w/support from senior project manager
Recruit and hire national project coordinator	Complete hiring process and onboarding of new staff member	March 2025	██████████, Co-Project Director
Select members of core development	Select teachers from pilot schools with highly-engaged STEM teachers to develop/refine arts	April 2025	██████████, Implementation

team (Obj 1.1)	integrated units		Director
Monthly meetings with core partners	YAI, ArtsNOW and YALA leadership teams meet monthly to assess progress toward milestones, ensuring objectives are met on time and within budget	Monthly throughout 2025 and 2026	██████████ & ██████████, Co-Project Directors
Refine evaluation assessment tools	Develop interview protocols for core development team, as well as focus group protocols for teachers piloting units in 2025/26; collect baseline achievement data	Summer 2025	External evaluator
Monthly meetings w/core development team re: unit content	A 14-person core development team (12 teacher leaders from GA/SC and 2 from YALA) meets to discuss improvements to existing STEM units	2025-26	██████████, Impl Director, and arts consultants from ArtsNOW
ArtsNOW Foundational Seminar	YALA attends annual seminar, collaborates with ArtsNOW to build capacity to deliver multi-year schoolwide professional learning	Summer 2025 and 2026	ArtsNOW staff
Digital coaching cycles for teacher leaders in pilot schools (Obj 1.5)	4 cycles per year (3 sessions per cycle), Arts coaches review the video with them, providing feedback, reflecting on what they did well and what they could improve for future lesson delivery; i.e., video-based, analysis-of-practice PD (Taylor et al., 2015)	Sept 2025 to April 2026	Arts and instructional consultants from ArtsNOW
Leader networking conference, planning for implementation	Principals and teacher leaders, along with a district leader from each pilot district attend conference with Young Audiences to plan for feasibility study	Spring 2026	YAI and Project Co-Directors
Quarterly progress reports	Four times/year, progress summaries will be provided to ArtsNOW and partner entities documenting the activities within the feasibility study, and feedback from teachers	March, June, Sept, and Dec of 2025 & 2026	Evaluator with support from YAI (██████████) and ArtsNOW (██████████)

E.) PROJECT EVALUATION

The plan for evaluation includes both a feasibility, or pilot, study as well as an impact study. The feasibility study will include analysis of data related to the fidelity of implementation, delivery of, and teacher participation in, professional learning, and feasibility and usability of the resources developed and refined in Years 1-3. The feasibility study (e.g. formative evaluation) addresses EIR program measures 3 and 5 in

the NIA “evaluations designed to provide performance feedback to inform project design” and “evaluations that provide information about key elements and approach so as to facilitate replication in other settings”. Following the feasibility study in 2026-27, the intervention will be replicated in nine additional schools across three states, using a cluster quasi-experimental design (QED) to provide evidence of EASE’s effectiveness at improving student outcomes (EIR program measure 4). The evaluation is guided by six research questions, three confirmatory and three exploratory. The mixed-methods evaluation will measure the impacts of the intervention on students’ math and science achievement, as well as mediating variables such as teacher engagement and classroom practice.

Confirmatory research questions: (1) What is the impact of EASE units on students’ math and science achievement after one year of participation? (2) What is the impact on students’ math and science achievement after two years of participation? (3) To what extent does the professional learning focus on arts integration impact teacher well-being?

Exploratory research questions: (4) Do the impacts on the math and science assessments vary based on the students’ eligibility for free/reduced price lunch or English Language Learner status? (5) Do the impacts on students’ achievement vary based on the level of implementation fidelity in each school? (6) To what extent does the use of arts integrated learning improve student engagement?

E1) The evaluation will produce evidence that meets the WWC standards with reservations.

A covariate-weighted multilevel model will be used to analyze the impact of participation in EASE on student academic success. The design for the impact study is based on the What Works Clearinghouse (WWC) Study Review Protocol (Version 5.0, 2023). Our QED will compare student outcomes across nine treatment schools and 18 comparison schools that do not receive the intervention. Appendix J includes copies of all data collection instruments.

Sample size calculations and matching: All three participating districts include at least a dozen or more high-need elementary schools eligible to participate (see Section B3). In Spring 2027, three treatment schools will be selected per district, and will participate in the full intervention during 2027-28 and 2028-29 school years. From the pool of remaining elementary schools, one-to-many propensity score matching (Austin, 2011) will be used to select two comparison schools for each treatment school, so the total sample size (27 schools) will be adequately powered while also limiting the treatment group to nine

schools consistent with the capacity of ArtsNOW and YALA to provide support with fidelity over two years. Per WWC standards, schools will be selected that demonstrate baseline equivalence to the treatment schools in terms of locale, one standardized measure of academic achievement (baseline math score), proportion of English Language Learner (ELL) student enrollment and proportion of students eligible for free/reduced priced lunch. Propensity scores will be calculated based on these variables utilizing nearest neighbor matching without replacement. Once matched comparison schools are selected, postmatching analysis will verify baseline equivalence of students as well as baseline equivalence of clusters (schools) using prior year's (adjacent cohort) student achievement data in math as well as student enrollment data related to the proportion of economically disadvantaged students and ELLs. Evaluators will verify baseline differences (based on Hedges' g) do not exceed .25 and will include covariates to adjust for pre-intervention differences.

Power analysis and effect size estimates: The *PowerUp!* Tool (Dong & Maynard, 2013) established the recruiting targets for the impact study using design parameters suggested by Zhang, Spybrook and Unlu (2020) for studies focused on both student and teacher outcomes, along with estimates suggested by Kowalski et al. (2020) for studies of teacher professional development. Specifically, these authors suggest two power analyses “are necessary for planning [studies] that aim to detect both teacher and student effects in one study”. The analysis will use a 2-level cluster design (e.g. students clustered within schools for achievement analysis and teachers nested within schools for teacher well-being) with parameters including: power=0.80, $\alpha=.05$. *Student outcomes (RQ 1 & 2)* - we expect using demographic data and student-level prior year math scores as covariates will explain 68% of the within-classroom variance and 65% of the between-school variance. As Xu and Nichols (2010) point out, “individual student test scores...may be the most effective single covariate that will significantly improve the precision” (p. 8). Given the above assumptions, a sample size of 27 schools, with 33% assigned to treatment, will yield a minimum detectable effect size (MDES) of 0.239. The MDES is based on an estimate of 240 students in tested grade levels (3-5) per school. Kraft et al. (2018) describe an effect size at or above 0.20 as “large” for upper elementary students, who are the population of interest for this analysis. *Teacher well-being outcomes (RQ 3)* – we expect use of school-level pretest scores on teacher well-being as a Level 2 covariate will explain 75% of the variance between schools, and use of teachers’ years of experience as a covariate

will explain 40% of the within-school variance. Given a sample size of 27 schools, using a conservative estimate of an average of 28 teachers per school contributing survey data (estimated 70% response rate), this will yield a minimum detectable effect size (MDES) of 0.282 (see parameters in Appendix J). Kowalski et al. (2020) suggest effect size estimates of teacher outcomes vary based on the characteristics and duration of the professional development.

Student achievement measures (RQ1 & 2): The WWC Standards Handbook (2022) states that standardized tests are “assumed to have face validity and be reliable” because they have “established administration and scoring procedures”. This analysis will include both continuous and categorical achievement variables. Specifically, continuous scale scores will be converted to standardized scores (e.g., z-score), using the state-level mean and standard deviation for each test and grade level in each state. In addition, student performance levels will be dichotomized to reflect whether students achieved their state’s proficiency standard for their grade level. The former allows more precision in the impact estimates, where the latter allows another view of the outcome data through the use of binary logistic regression to determine if the odds of achieving proficiency are greater for students attending EASE schools. Louisiana is the only state administering a science assessment in 3rd grade, so the analysis of science achievement will focus on 4th and 5th grade scores, using prior year’s math score as a covariate for analysis of science outcomes. Analysis of math outcomes will include grades 3-5 in all three states, establishing baseline equivalence in spring 2027, and outcome data in spring 2028 and spring 2029. The WWC review protocol states, “intermediate outcome measures that reflect partial exposure to an intervention can also provide useful information about the intervention’s effectiveness” (p. 4). RQ 1, above, will examine intermediate outcomes after one year of exposure to the intervention during 2027-28 school year, and RQ 2 will examine summative outcomes after the full two-year intervention.

Teacher Well-Being measures (RQ3): The WWC review protocol (2023) defines teacher well-being as “outcomes that measure teacher satisfaction, perceived ability to do one’s job, intentions to continue teaching and perceived leadership support” (p. 8). The *Educator Engagement Survey* covers four key domains of engagement: Emotional, Social, Behavioral, and Cognitive. For this study's purposes, the focus will be the emotional (4 items) and social (5 items) engagement factors (AIR, 2020; see items in Appendix J). In addition, items will be added to the survey that measure turnover intentions as it has been

shown to be “strongly related to turnover” (Nguyen et al., 2024) Continuous variables will be used reflecting overall item mean (composite score). During the feasibility study, the full set of items will be administered to pilot teachers to verify the internal reliability (Cronbach’s α) meets WWC standards.

Covariates and mediators: To increase the precision of impact estimates, school-level and student-level covariates will be added to the models analyzing student achievement outcomes. Specifically, average scores on both the Educator Engagement Survey and the EQUIP Observation protocol will be included as covariates to measure the relationship between the school environment and achievement outcomes and the extent to which these factors mediate the relationship between the intervention and student outcomes. For example, estimating a two-way interaction within level 2, between treatment status and aggregate teacher engagement or between treatment status and use of inquiry-based instructional practices provides important information about the mechanisms through which the intervention may be impacting student achievement. In addition, Level 1 (student-level) covariates will include economic disadvantage status, English learner status, and individual-level test scores lagged one year. For analysis of science achievement, prior year’s math score will be used as a covariate since two of the three states only administer a science assessment once in elementary school. Similarly, cross-level interactions between Level 1 and Level 2 predictors (covariates), such as treatment status and a student’s economic disadvantage status or English learner status, can determine the extent to which the intervention has a differential impact on some student subgroups (RQ4). Analyses of teacher well-being outcomes will include a school-level covariate reflecting a baseline (pretest) score on the outcome measure and a teacher-level covariate of years of experience.

Attrition and representativeness of clusters: Because delivery of the intervention is dependent upon teachers who participate in professional learning, teacher turnover between the first and second year of the intervention could impact the study. We will try to avoid attrition through the following efforts: 1) ensuring principals understand study requirements before they commit; 2) ask principals to sign an MOU specifying incentives along with their teachers’ role and expectations; 3) limiting teacher time out of the classroom by providing professional development on non-instructional days; and 4) using data gathered in the feasibility study to identify potential barriers that might contribute to attrition. We will assess representativeness of clusters to ensure we limit the bias due to non-response. However, because the primary outcomes of interest are the state math and science assessments, we anticipate low student attrition.

For the teacher well-being measure, incentives will be provided (e.g., chance to win a gift card) to improve response rates across treatment and comparison schools. Because we have strong support from districts leaders, we also anticipate low cluster-level attrition across the impact study.

E2) The evaluation will provide performance feedback and permit periodic assessment of progress toward achieving intended outcomes. The formative data sources will include both qualitative data (interviews, focus groups) and quantitative data (surveys of both students and teachers). Responses to open-ended survey items (from all teachers), as well as annual focus groups with teachers in one school per district, will provide feedback on the role of the arts consultants and teacher leaders in their school, the evolution of teachers' relationships with people in both roles, and the extent to which teachers are able to make use of the professional learning and arts integrated instructional resources. Effective communication and coordination of the partners will be ensured through monthly check-in meetings including the YA project manager, co-project directors, site managers (ArtsNOW and YALA) and the external evaluation team; monthly meetings between YAI co-project directors and regional managers; supported by quarterly progress reports provided by the evaluator to all project staff and districts that include any issues requiring attention. Communication between the evaluator and the program staff will occur through in-person and virtual meetings, written progress reports and data summaries, and through evaluators' attendance at professional learning events, principal retreats and the annual leader networking event. Teacher leaders will complete quarterly reflection logs and teachers will complete a brief reflection at the end of each arts integrated unit delivered (see Appendix J). This will provide data on usability, as well as details about revisions needed to improve functionality. ArtsNOW and YALA will work with YAI project directors to systematically use this evidence to revise the resources and support structures to ensure that by the end of the grant period, the resulting arts-integrated STEM resources are of high quality.

Performance feedback: Avenues for feedback and continuous improvement are embedded in the design of EASE, and this process will provide valuable data sources to improve the implementation structure. The evaluation embeds mechanisms for feedback from teachers, who are ultimately the ones delivering the intervention. It is highly important to seek their honest feedback related to barriers and accelerators that may influence their implementation quality. The underlying principles guiding our

procedures for continuous improvement were developed through the Carnegie Foundation for Advancement in Teaching (Bryk et al., 2015). EASE will establish a continuous feedback loop which embeds “core principles of improvement” including: (1) make the work problem-specific and user-centered → by focusing on the implementation of integrated learning, and the experiences of the teachers and students throughout the process; (2) variation in performance → studying between-school and between-district differences in how EASE is being implemented; (3) see how local conditions shape work processes → collect data from school and district leaders, plus annual teacher surveys, to document local school context for implementation support; and (4) embed measures of key outcomes and processes → documenting teachers’ evolving perceptions, as well as development of arts integrated math and science units.

In addition, qualitative data on the “actor-oriented perspective” (Penuel et al., 2014) will be collected to document the instructional decisions teachers make as they attempt to apply the arts integration strategies and adapt the units and resources to their classroom practice. As Penuel et al. (2014) point out, “actor-oriented analysis provides specific insights that offer clues as to how curriculum materials and associated PD need to be modified to support teacher learning” (p.753). Interviews with teachers in the pilot study (2026-27) will provide data on the feasibility of integrating the arts and core subjects with fidelity, and whether the expected duration of the arts-integrated lessons is adequate. Teacher reflection questions will be completed after delivery of each integrated unit. Annual focus groups in each district will collect data on teachers’ perceptions and concerns, the feasibility of integrating the arts, and other forms of support teachers may need.

Assessment of progress toward outcomes: Previous studies of arts integrated learning have demonstrated a positive impact on student engagement (Mollette et al., 2024). To that end, we will administer a brief student engagement check-in tool each year to measure changes in students’ emotional and cognitive engagement (RQ6). The 7-item survey, developed by AIR and Communities in Schools (2020), has been validated as a reliable tool for capturing elementary students’ positive/negative feelings about school, feelings of belonging, and their attention to and excitement about what they are learning (see Appendix J). The survey developer has also provided guidelines for categorizing students’ scores as high,

moderate and low engagement. This will be useful data to project staff and teacher leaders in quantifying how much this project impacts students' engagement and enjoyment of learning. While a comparison of student engagement between treatment and control schools would provide additional information, some district policies prohibit the administration of surveys to elementary students as part of a research study in which their school is not actively participating. As such, it is not likely the evaluation team could collect data consistently across comparison schools each year, so this analysis will focus on within-group changes over time. In addition to analyses described in E1, the evaluation team will periodically assess progress toward teacher-focused outcomes, including review of artifacts such as lesson plans developed, participation at PL events, teacher leader reflections and readiness surveys, teacher perception surveys and ratings on the teacher self-assessment *Stages of Arts Integration* rubric (Brophy, 2011). This will allow a rich description of the role and contribution of the arts consultants and teacher leaders, which will be important information to guide replication and sustainability. Summaries of these reviews will be reviewed with YAI and ArtsNOW/YALA's regional project managers, and the arts consultants and teacher leaders.

E3) The evaluation plan clearly articulates key project components, mediators and outcomes, as well as a measurable threshold for acceptable implementation. Key project components, as well as mediators and outcomes are specified in the conceptual framework in Section B1. The key components experienced directly by the students consistently across schools include the delivery of at least 2-4 integrated STEM units per school year (depending on grade level, two math units in K-2 and four units (2 math, 2 science) in 3rd-5th), with additional arts integrated lessons developed by teacher leaders. Key support components include the delivery of professional learning and job-embedded support for teachers and teacher leaders, which will be carefully documented to ensure EASE is delivered as intended.

Implementation fidelity: Data will be collected at least quarterly on how teachers engage with the professional development support, and the fidelity with which they make use of the strategies. One tool used to measure implementation fidelity will be a rubric focused on arts integration. This rubric (see Appendix J) demonstrates face validity as it relates to the use of various art forms in core content instruction. Previous projects have used this rubric as a formative tool to provide feedback to teachers (not as an

outcome measure) and found interrater reliability to range from .60 to .70. The evaluation team will confirm that Cohen’s kappa meets WWC requirements.

Measurable threshold for acceptable implementation – During years 1 and 2, evaluators will work with YAI, ArtsNOW and the core development team to create an EASE Fidelity Matrix consisting of various components based largely on teacher participation in PL, structured lesson planning, engagement with teacher leaders’ support and delivery of integrated units. The tool will include a separate measure of fidelity of implementation for each key component of the intervention, to quantify the extent to which EASE was implemented as intended with 80% or higher indicating high fidelity and 60% to 80% indicating moderate fidelity, and scores below 60% indicating low fidelity. For example, one component may specify the target number of arts integrated lessons delivered per year, with 80%+ of that target delivered earning a score of two, 60%-80% earning a score of 1, and below 60% earning a score of 0. Another component may specify participation in training, where 80%+ staff participation earns a fidelity score of 2 for that component. For teacher leaders, completing all four coaching cycles may earn a fidelity score of 2, completing three of four would earn a 1 and completing two of four would earn a 0.

Mediation analysis: Because teachers are being trained to redeliver the intervention to students, it is important to measure teacher-level variables to determine if, or how, teachers’ practice or engagement can mediate the relationship between the intervention and student outcomes. Further, while teacher well-being can mediate the relationship between the intervention and student achievement, preliminary evidence from other similar projects suggests improved well-being can be an outcome in and of itself. Details provided above in Section E1 explain how teacher outcomes will be included in the analysis. Analysis of mediating variables includes the following measures, collected from both treatment and comparison schools: *Teacher well-being* – Each year, teachers will complete an engagement survey (described above) to measure the extent to which they are connecting with colleagues and have positive feelings about teaching. Previous studies with ArtsNOW’s schools have shown preliminary impacts on teacher well-being (Mollette et al., 2024), so it is important to study this construct reliably across treatment and comparison groups to determine what changes, if any, occur and how they may mediate the relationship between arts integrated teaching and student outcomes. *EQUIP Observation Protocol* – “EQUIP was designed to

evaluate teachers' classroom practice and evaluate PD program effectiveness" (Marshall et al., 2009, p. 312). Three constructs (Instruction, Curriculum and Discourse) will be measured through classroom observations conducted at each treatment/control school in years 3-5 with a randomly selected subsample of teachers. An overall score on the EQUIP factors will be included as a covariate in order to account for variability between schools in the level of inquiry-based instruction typical for a given school, as a potential mediating variable reflecting the instructional environment. EQUIP was tested to establish face and construct validity and measure internal consistency, which meet WWC standards with internal consistency (e.g. Cronbach's α) ranging from .88 to .89 (**further detail in Appendix J**).

Key components	Objective (see B2)	Data sources informing evaluation
Increased use of arts-integrated instruction (Direct)	2.4	*Quantitative – math and science assessment scores, educator engagement survey, <i>Student engagement check-in</i> tool (AIR, 2020) *Qualitative – focus groups, thematic analysis of open-ended survey items. (Creswell, 2014) EQUIP observation protocol (Marshall, 2009)
Leadership support that sustains use of arts integration (Support)	1.2, 2.1, 2.2	*Quantitative – EASE teacher perception survey; <i>Educator Engagement Survey</i> (AIR, 2020), comparing project/comparison schools' aggregate teacher well-being; <i>Implementation Leadership Scale</i> (Lyon, 2018) *Qualitative – teacher leader reflections, principal interviews and implementation fidelity rubrics completed in 2027-28 and 2028-29
Delivery of evidence-based professional development (Support)	1.4, 2.3	*Quantitative – teacher attendance at PL events, logs of coaching visits with teacher leaders (TL), perception surveys, TL readiness survey. *Qualitative – focus groups with teacher leaders, interviews with school leaders and arts consultants; open-ended survey items from teacher perception survey
Develop & refine arts integrated STEM lessons (Support)	1.1, 1.3	*Qualitative – interviews with teachers to identify barriers and accelerators to implementation; focus group with core development team to document development process; arts integration assessment rubric *Quantitative – # of integrated STEM units developed, and # of lessons per unit; teacher perception survey related to STEM units' feasibility/usability