

# CALL FOR PROPOSALS

## EF+MATH program

c/o NewSchools Venture Fund  
1616 Franklin Street, Second Floor, Oakland  
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### **EXECUTIVE SUMMARY**

The EF+Math Program funds and supports teams to develop innovative, effective approaches to significantly improve math outcomes for students in grades 3-8 in historically under-resourced schools by embedding executive function (EF) training into high-quality math learning. The EF+Math Program is different from typical education funding programs; awards under this Call for Proposals will be contracts, not grants, made to multi-disciplinary teams of experts in executive function, math and educational equity research, who are coming together to pursue the goal of developing, testing and refining approaches that blend high-quality math content and instruction with activities that build EF capacity during math learning. These teams will work in partnership with educators to ensure solutions are designed to be useful, usable, equitable and effective. The EF+Math Program Director and Deputy Director will be substantially involved in the scientific and programmatic decision-making aspects of each funded project. Representatives of the EF+Math Program team will also provide technical assistance to program teams to enhance work products. The program will require a high degree of collaboration between awardees and program staff, among awardees and between awardees and school district partners to rapidly iterate on solutions through an *inclusive R&D approach*. The EF+Math Program values diversity, equity and inclusion in every component of its work. Strong teams will represent the racial, ethnic and gender balance of the students the program serves.

### **KEY DATES**

Program Announcement	August 22, 2019
Call for Proposals Webcast and Publication	August 29, 2019
Concept Notes Due: <i>Applied Research Track</i>	Rolling; No later than October 3, 2019
Concept Notes Due: <i>Prototyping Track</i>	Rolling; No later than December 11, 2019

### **POINTS OF CONTACT**

Program Director: Prof. Melina Uncapher  
Deputy Program Director: Dr. Aubrey Francisco

### **QUESTIONS**

Questions may be sent to [proposals@efmathprogram.org](mailto:proposals@efmathprogram.org). Responses to frequently asked questions will be posted to the EF+Math Program Website: <https://www.efmathprogram.org/faqs>

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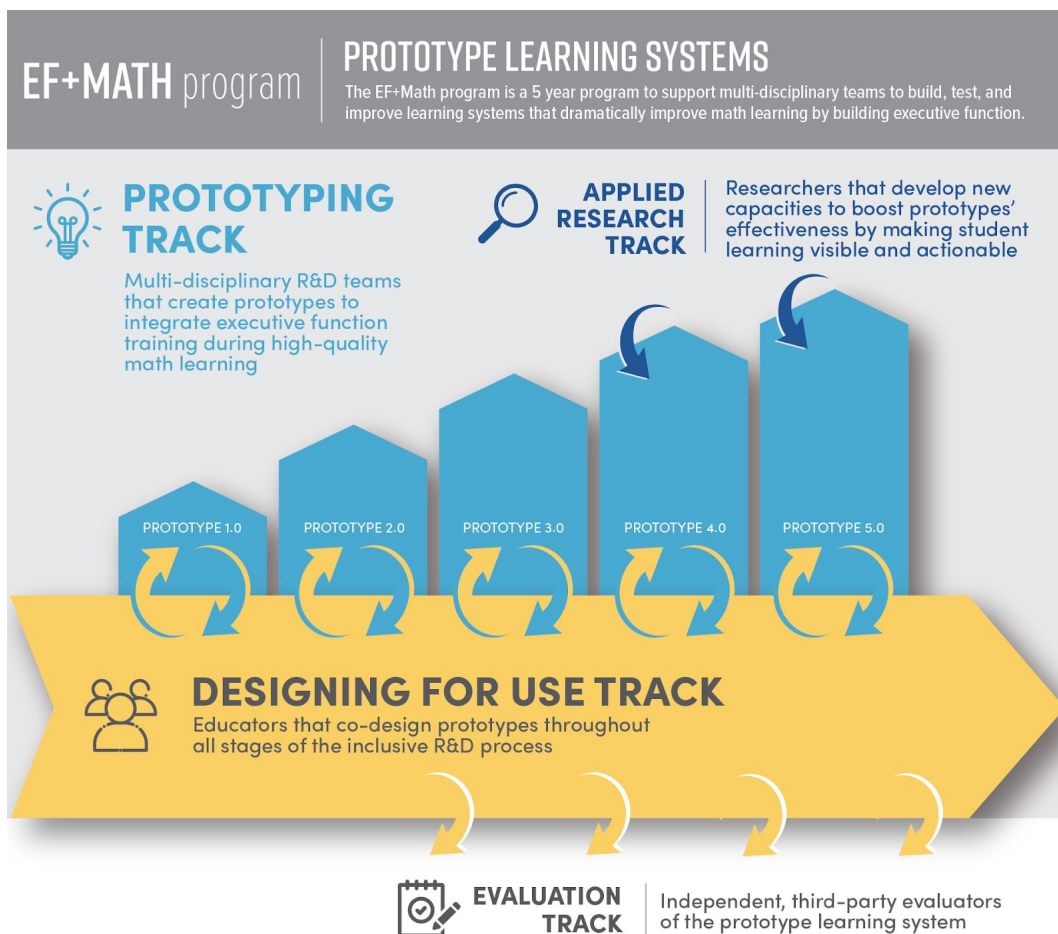
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## DESCRIPTION OF PROGRAM

### A. Introduction

The EF+Math Program, a fiscally sponsored project of NewSchools Venture Fund, is a five-year program that will fund and support multi-disciplinary teams to build prototype learning systems that integrate executive function-building activities into high-quality, evidence-based math content and instruction through four tracks: Prototyping, Applied Research, Evaluation and Designing for Use (Fig 1). **Note: only proposals for the Prototyping and Applied Research Tracks are being sought under this solicitation.**

Prototyping and Applied Research teams will work closely together to build, test and improve prototype learning systems that promise to create breakthrough improvements in math proficiency in 3rd through 8th graders in historically under-resourced schools. Applied Research teams will develop innovations that make learning visible and actionable and feed these innovations to prototypes developed by Prototyping teams. Prototyping teams will work directly with educator co-design partners through all stages of the research, development, implementation and improvement process through the Designing for Use Track.



**Figure 1:** The four tracks of the EF+Math Program: Designing for Use Track (for educators), Prototyping Track (for researchers and developers), Applied Research Track (for researchers) and Evaluation Track (for evaluators).

The EF+Math Program is soliciting proposals for innovative projects that will develop prototype learning systems that draw on (1) rigorous research on how students learn math and build math-relevant executive function skills, (2) educator expertise on how math is taught, within the assets and constraints of real-world classrooms, and (3) knowledge from designers and developers of programs or products on how to achieve impact at scale. The goal of the EF+Math Program is to develop bold new approaches that provide students opportunities to become powerful math learners with strong executive function skills. The program aims to support practical work in historically under-resourced schools, with the goal of significantly increasing the number of students in grades 3-8 who are proficient or advanced in math.

We are intentionally open-ended in describing what a prototype ‘learning system’ might be, as we aim to solicit the most innovative, bold ideas from the field. The minimum criteria include the following (see section C.1 for additional prioritized criteria):

1. The learning system must be designed and implemented for one or more grades in the middle years (grades 3-8) for students in historically under-resourced schools.
2. The learning system must be designed to build EF skills during math learning.
3. The learning system must be designed to build conceptual understanding of math and multi-step problem solving skills in math.
4. Student privacy must be rigorously designed and protected from the beginning (i.e., ‘Privacy by Design’).
5. The learning system must be designed with equity at the center (i.e., ‘Equity by Design’).
6. The learning system must be designed to be effective across multiple contexts (i.e., designed for scale).
7. The learning system must fit within the typical school structure (i.e., integrate into established structures or routines).
8. The learning system must be able to test hypotheses about which EF domains are most important for which aspects of math learning.

The EF+Math Program is a five-year program, with four tracks, each consisting of multiple phases. The phases in the two tracks included in this Solicitation (Prototyping and Applied Research) require demonstrated success at each phase to unlock future funding. At the end of each phase, the Director and Deputy Director will assess the entire program and determine whether continued funding will advance the larger program objectives. Thus performance, in the context of advancing overall program objectives, will unlock subsequent funding at the end of each phase.

## **B. Background**

Executive functions (EFs) are the foundational skills that allow us to manage our attention, thoughts, emotions and behavior to reach our goals. Strong EF skills are central to many important outcomes in school and life. All students have EF skills; how they are developed and deployed depends on the quantity, quality and variety of opportunities students are given to build and practice these skills.

EF skills are correlated with math performance even after controlling for other factors such as prior knowledge. These correlations have generated tremendous interest in EFs as a promising lever for potentially improving math performance. However, EF training programs have typically shown only modest results on EF outcome measures, with meta-analyses converging on an average effect size of  $\sim .30$ , when collapsing across all students and training regimes (e.g., Takacs & Kassai, 2019; Jacob & Parkinson, 2015). Given the varied exposures students have to practice opportunities that build math-relevant EF skills, it may be that what works for whom, in what settings and in which mathematical tasks is particularly relevant when training EF skills. For instance, when disaggregating training data by household income, researchers find much larger effects of EF training, with effect sizes up to  $\sim .80$  for students from low-income households (e.g., Blair & Raver, 2014). Likewise, the type of training matters: a recent meta-analysis found that biofeedback strategies and strategy-teaching interventions

produced strong effect sizes of .93 and .76, respectively, in non-typically developing children, and computerized cognitive training and mindfulness training produced average effect sizes of .60 and .46, respectively, in typically developing children (Takacs & Kassai, 2019). A training regime that may prove particularly promising is building EFs in the contexts they will be used, for example, embedding EF training in math learning tasks (see e.g., Alloway, Robinson, Frankenstein, 2016, for review).

The objective of the EF+Math Program is to significantly increase the number of middle years (grades 3-8) students in historically under-resourced schools who are proficient or advanced in math. The “proficient” and “advanced” levels are defined by the National Assessment of Educational Progress (NAEP). A strong increase in the number of students in under-resourced schools who can demonstrate achievement at these levels is highly desirable and would be nationally important. Achieving this increase will likely require better preparing students to be proficient on tasks that emphasize **conceptual understanding** and/or **multi-step problem solving**, as these two types of tasks differentiate students who perform or do not perform at the proficient level on [NAEP](#). Further, stronger EF is likely needed for student performance on conceptual understanding and multi-step problem-solving tasks. Thus, this solicitation encourages teams to build and test innovative approaches to strengthening EF in the context of math tasks at the proficient level, including tasks that stress conceptual understanding and multi-step problem solving.

In sum, this funding mechanism aims to support R&D programs that will build prototypes to test the following hypothesis: *If (1) EFs are trained in the contexts of students learning math, (2) training is specifically designed for students in historically under-resourced schools, and (3) math learning is focused on developing proficiency in conceptual understanding and multi-step problem solving, then we can demonstrate significant improvements in math-relevant EFs, which will lead to breakthrough gains in math performance.*

### C. Program Description/Scope: Overview

The EF+Math Program aims to bring insights from learning science research to bear on building solutions to real-world problems in ways that can demonstrate impact at scale. The program is not funding basic research that only results in published papers, nor is the program funding product development that simply commercializes a new program or product. Our work lies between these realms and requires a different program management approach: the Director and Deputy Director will work closely with all contributors and actively manage, coordinate and support the work of the funded teams toward our program objective.

Other notable elements of the program:

- We will create opportunities for multi-disciplinary teams to form and co-create ideas for these bold new approaches;
- We will ensure educators are at the table and have an elevated voice in the co-design process through our inclusive R&D model;
- We ensure that the work includes equity and privacy by design, is grounded in the science of learning, is piloted and improved in classrooms and is useful and usable to teachers and students.

By inviting nontraditional collaborators to engage in rapid, iterative prototypes that address long-standing challenges in math learning, our goal is to leapfrog more traditional R&D efforts and unleash new approaches that can make significant gains in math and EF outcomes for students.

The EF+Math Program seeks to achieve this bold objective through four tracks: Prototyping, Applied Research, Evaluation and Designing for Use (**Fig 1**). Proposals for the Prototyping and Applied Research Tracks are being sought under this solicitation (these tracks are described in detail below).

The **Prototyping Track** consists of two paths: the *Integrate Path* and the *Build Path*.

The **Applied Research Track** has two technical areas: *Making Learning Visible* and *Making Learning Actionable*.

Teams can apply to any or all four areas as appropriate, **in separate, non-duplicate applications**.

Awards made under the EF+Math Program can be multi-year/multi-phase and include options for continued performance. All awards will start with a Proof of Concept phase (Phase 1). The phases of each track are visualized in **Fig 2** and described below. The program deploys aggressive timelines to rapidly explore the prospects of new capabilities.

	2019-2020 SY				2020-2021 SY				2021-2022 SY				2022-2023 SY				2023-2024 SY													
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Prototyping Track: Integrate Path	Pre-contract award				PHASE 1				PHASE 2				PHASE 3																	
Prototyping Track: Build Path	Pre-contract award				PHASE 1				PHASE 2				PHASE 3				PHASE 4				PHASE 5									
Applied Research Track: Making Learning Visible	PHASE 1				PHASE 2				PHASE 3				PHASE 4																	
Applied Research Track: Making Learning Actionable	PHASE 1				PHASE 2				PHASE 3				PHASE 4																	

**Figure 2.** Timeline and duration of Prototyping Track and Applied Research Track phases.

Concept Notes submitted in response to this call for proposals must address all phases as described below for the appropriate track and related path or technical area. Full proposals will be requested by invitation only. The process for receiving an invitation is outlined in Section C below. Awards will initially fund Phase I. Successful performance will determine whether subsequent phases are funded.

Note: Awards to be made under the program will be contracts, not grants. This is because the EF+Math Program team will have substantial involvement in the project and funding of subsequent phases will be contingent upon how project outcomes contribute to larger program objectives.

**C.1 PROTOTYPING TRACK**

Prototyping Track teams will design and develop teacher- and student-centered learning systems that embed EF training within high-quality math content and instruction, with a specific focus on increasing students’ conceptual understanding and multi-step problem-solving skills in math. As described in the Introduction, we are intentionally open-ended in describing what a prototype ‘learning system’ might comprise, as we aim to solicit the most innovative, bold ideas from the field. The *minimum criteria* that determine in-scope proposals include the following (see page 8 for additional *prioritized criteria*):

1. The learning system must be designed and implemented for one or more grades in the middle years (grades 3-8) for students in historically under-resourced schools.
2. The learning system must be designed to build EF skills during math learning.
3. The learning system must be designed to build conceptual understanding of math and multi-step problem solving in math.
4. Student privacy must be rigorously protected and designed from the beginning (i.e., ‘Privacy by design’).
5. The learning system must be designed with equity at the center (i.e., ‘Equity by design’).
6. The learning system must be designed for effectiveness across multiple contexts (i.e., designed for scale).
7. The learning system must fit within a typical school structure (i.e., integrate into established structures or routines).
8. The learning system must be able to test which EF domains are most important for which aspects of math learning.

The Prototyping Track consists of two paths:

- *Integrate Path*, which funds existing math learning programs/products to modify their programs/products to integrate EF training, and
- *Build Path*, focused on building novel math learning systems that embed EF training within authentic, evidence-based math learning.

We describe the two paths in the following sections.

Note that for both paths, teams submitting Concept Notes are expected to have all the necessary expertise to meet the stated objectives, and thus will necessarily be multi-disciplinary. To support individuals in connecting with potential collaborators and developing initial concepts, the EF+Math Program will provide facilitated opportunities to form teams. Specifically, individuals are invited to apply to join an optional **Facilitated Team Development process** that connects potential team members through an online community, virtual workshops and an in-person workshop (see **application process section** and **Fig 3** on page 12 for additional details on the Facilitated Team Development process and to submit an application to participate). Participation in the Facilitated Team Development process is **not** required to submit Concept Notes; self-assembling teams are encouraged to proceed directly to submitting a Concept Note.

We anticipate that teams may take any number of forms and will likely include co-equal members from more than one institution. However, we will make only one award per team. Teams will need to indicate which member organization of their team will enter into the program award on their behalf.

The proposed learning system must be designed to build students' conceptual understanding of math and multi-step problem-solving skills (and how EF skills will be improved/practiced within this math frame). The specific topics should be important to students' long-term growth in math. Within these conditions, applicants can choose any set of math topics. The chosen topics should allow teachers and students to use the prototype at multiple times in the school year. This condition allows for multiple rapid-cycle testing and improvement in schools each year of prototype development.

Teams should design prototypes that enable widespread school adoption and lead to teacher and student use that is frequent and intensive enough to make a dramatic difference in student learning. One reason that innovative technologies for math classrooms can have weak adoption or infrequent use is that teachers don't see how they fit into established structures or routines, or improve teaching and learning activities that educators recognize as needing improvement. Teams should consider innovating for the recurrent structures, activities and routines in math classrooms that an EF+Math prototype could improve. The following list of improvable structures, activities and routines are intended to be suggestive and not to exclude additional concepts for prototype designs. This list was generated by considering the types of designs that have demonstrated positive evidence at scale in experimental studies in math education:

- **Small group and collaborative learning** is a frequent activity in many math classrooms and a prototype could guide students and teachers to build EF skills to tackle challenging math problems concurrently.
- **Homework assignment, individual work and review** is a commonplace routine that teachers and students often spend substantial time on every week, but no one particularly loves. A prototype could combine EF and challenging math to improve learning during homework routines.
- **Individual tutoring or mentoring** can be highly effective for math learning and might be enhanced via a prototype that incorporates EF and uses technology to increase the affordability and reach of tutoring services.
- **Games, puzzles, simulations and other playful, extended tasks** have a long tradition in math education and could be a way to package an experience which highlights the interweaving of EF and math growth

in a form that is attractive to students and teachers, and thus gains frequent and intensive use.

- **Replacement units** could package together a comprehensive EF+Math prototype to completely replace teachers’ existing curriculum for a few challenging, important topics per year, which could be a way for educators to try an approach that eventually might become an entire year-long curriculum.
- **Additional time and space** is sometimes allocated to math instruction, for example, an additional period of math, study hall or lab and it is desirable for that time and space to complement core instruction but not look exactly like it. A design for how to best use additional time or space to complement core instruction could give a shape to a prototype that would fit a school need.

We encourage bold and innovative ‘big bets’ that may not fall into any of the foregoing categories but have the potential for scalable impact. Regardless of the delivery envelope, the prototype must address the minimum criteria described above in this section. Additional *prioritized criteria* include:

- Diverse leadership team with necessary expertise
  - *Integrate Path*: executive function research and math program / product developers
  - *Build Path*: math research (math education and math cognition), executive function research, educational equity and math program design and development
  - Demonstrated commitment to equity
- Strong plan for effective team collaboration
- Right-sized budget
- R&D approach that meaningfully includes educators at all stages
- Feasible plan to transition prototype into U.S. schools, including necessary characteristics to ensure adoption, such as ease of use by both teachers and students without extensive training or professional development and reasonable cost to implement in under-resourced schools.

**C.1.1. INTEGRATE PATH**

**Description:** Under the Integrate Path, awardees of the EF+Math Program will modify existing math programs/products to include integrated EF training. The proposer must already have an existing math program or product that can, at a minimum, provide a supplement to instruction on at least two to three important topics in a grade level, covering a meaningful duration of time and scope of math.

We expect existing math program/product teams to collaborate with EF researchers to co-design EF interventions appropriate to the existing math program/product.

**Milestones:** Progress toward successful prototype completion will be assessed at the end of each phase based on milestones described in the table below. Proposers must provide a means of measuring success for each metric as part of their proposal.

Milestone	Measure
<b>Phase 1 (8 months) - <i>Promising prototype</i></b> , with promise demonstrated by qualitative and quantitative feedback from students and teachers to demonstrate the usefulness and usability of prototype / new features.	TBD by Proposer
<b>Phase 2 (12 months) - <i>Initial validation of prototype</i></b> , demonstrated by significantly improved student EF scores and math outcomes for students in historically under-resourced schools in small-scale design	TBD by Proposer



and development pilot study.	
<b>Phase 3 (12 months) - Validation of the prototype at scale,</b> demonstrated by significantly improved student EF scores and math outcomes for students in historically under-resourced schools in a large-scale evaluation study (10,000 students).	TBD by Proposer

**Phasing:** Phase 1 has a duration of 8 months with a target start date of May 1, 2020 (Fig 2 on page 6). It comprises the development of a promising prototype that incorporates EF training into the existing math program/product and is ready for small-scale testing in classrooms during phase 2. Phase 2 has a duration of 12 months and comprises initial validation of the developed prototype and classroom testing in a sufficient number of classrooms and schools to provide initial validation. Phase 3 has a duration of 12 months and comprises improvements made to the prototype based on the results of phase 2 testing and validation at scale through an efficacy study with a population of 10,000 students across the appropriate number of classrooms and contexts. Integrate teams will conduct on-going studies to inform rapid-cycle, iterative development. The classroom testing studies of prototype learning systems in Phases 2 and 3 will be conducted near the end of each school year by the Independent Evaluation Team.

Potential product improvements developed by Applied Research Track teams will be made available to teams in the Integrate Path and can be embedded into prototypes at various points as appropriate.

Funding for phases 2 and 3 will depend upon the outcomes achieved at each prior stage. The EF+Math Program Director and the Evaluation Track team will evaluate prototype performance against milestones described above to determine if a team has sufficiently met its goals to progress into the next phase.

**Anticipated Number of Phase 1 Awards:** Two (2) to Four (4) Awards

**Estimated Amount of Total Integrate Path Funding (Subject to Change):** \$3 million

**C.1.2. BUILD PATH**

**Description:** Under the Build Path, awardees of the EF+Math Program will build a new math learning system that addresses the stated program objectives. The proposed approach can be entirely novel or in early stages of development, either within an academic setting or by an existing math program/product provider.

Teams are expected to be multi-disciplinary--we anticipate that teams will comprise EF researchers, math researchers (both math education and math cognition), educational equity researchers and math software/math program developers.

**Milestones:** Progress toward successful prototype completion will be assessed at the end of each phase based on milestones described in the table below. Proposers must provide a means of measuring success for each milestone as part of their proposal.

Milestone	Measure
<b>Phase 1 (8 months) - Interactive working prototype</b> developed based on teacher and student input. Positive usability feedback from teachers and students.	TBD by Proposer

<p><b>Phase 2 (7 months) - <i>Prototype with increased functionality.</i></b> Improved usability demonstrated by qualitative and quantitative feedback from teachers and students; early indicators of improved student EF and math outcomes for students in historically under-resourced schools.</p>	<p>TBD by Proposer</p>
<p><b>Phase 3 (12 months) - <i>Improved prototype with initial validation.</i></b> Significantly improved EF scores and math outcomes for students in historically under-resourced schools in small-scale design and development pilot study.</p>	<p>TBD by Proposer</p>
<p><b>Phase 4 (12 months) - <i>Improved prototype with mid-scale validation.</i></b> Significantly improved student EF scores and math outcomes for students in historically under-resourced schools in mid-scale evaluation study (1000 students).</p>	<p>TBD by Proposer</p>
<p><b>Phase 5 (12 months) - <i>Mature prototype with validation at scale.</i></b> Significantly improved student EF scores and math outcomes for students in historically under-resourced schools in a large-scale evaluation study (10,000 students).</p>	<p>TBD by Proposer</p>

**Phasing:** Phase 1 has a duration of 8 months with a target start date of May 1, 2020 (**Fig 2 on page 6**). It comprises development of an early interactive, working prototype based on feedback from co-design district partner leaders, teachers and students. Phase 2 has a duration of 7 months and comprises the development of an improved prototype with increased functionality through multiple small-scale cycles of testing and refinement in classrooms. Phase 3 has a duration of 12 months and comprises improvements made to the EF+Math prototype based on the results of phase 2 through multiple cycles of testing and refinement and small-scale design and development studies in a sufficient number of classrooms and schools to provide initial validation. Phase 4 has a duration of 12 months and comprises improvements made to the EF+Math prototype based on design and development studies and a mid-scale efficacy study (at least 1,000 students). Phase 5 has a duration of 12 months and comprises improvements made to the EF+Math prototype based on the results of phase 4 and a large-scale efficacy study with a population of 10,000 students. Build Path teams will conduct on-going studies to inform iterative development and refinement, and the independent Evaluation Track team will conduct classroom testing studies of the prototypes in Phases 3, 4 and 5 near the end of each school year.

Potential product improvements developed by Applied Research Track teams will be integrated into prototypes at various points. See the schedule in **Fig 2** (on page 6) for a graphical representation of the Build Path phases with the anticipated Applied Research insertion points overlaid against the academic year.

Funding for phases 2-5 will depend upon the outcomes achieved at each prior stage. The EF+Math Program Director and independent Evaluation Track team will evaluate prototype performance against metrics described above to determine if a team has sufficiently met its goals to progress into the next phase.

**Anticipated Number of Phase 1 Awards:** Two (2) to Four (4) Awards

**Estimated Amount of Total Build Path Funding (Subject to Change):** \$12 million

### C.1.3 MEASURING SUCCESS IN PROTOTYPING TRACK

The EF+Math Program requires ongoing, rigorous evaluations throughout the research and development process to support and measure program success. The EF+Math team will provide programmatic support to Prototype teams to design rapid-cycle, formative evaluation methods (“technical assistance”) and will solicit competitive proposals for long-term evaluation by an independent Evaluation Track team.

Prototype teams are responsible for designing and conducting their own classroom studies during rapid-cycle, in-school testing to inform the iterative improvement of the learning systems. Prototyping teams should identify valid measures of key program outcomes; however, the EF+Math Program will provide technical assistance support to the Prototyping teams to revise and improve measures post-award. These studies will initially address questions of feasibility and usability and early indications of potential impact on EF and math learning.

*Technical Assistance.* The EF+Math Program will provide technical assistance to the Prototyping teams to strengthen the iterative development studies described in the proposals, including best strategies for testing components of the new systems; the design of instruments to gather student and teacher feedback on the systems; selection and/or creation of measures of EF and math skills to be used by all Prototype teams; and preparation of datasets for use in future analysis. See **F. Programmatic Support** on page 22. We are particularly interested in new approaches that can build a body of knowledge about the impact on student skills throughout the ongoing design and development process, rather than waiting until the prototype learning systems are fully developed.

*Independent Evaluation.* An independent, third-party Evaluation Track team will design, implement and interpret rigorous, objective studies of the prototype learning systems at several points during development to document the feasibility, usability and impact of the learning systems on student growth of EF skill and math achievement (particularly for students in historically under-resourced schools). A separate Call for Proposals for the Evaluation Track team will be available in the Fall of 2020. Prototype teams are expected to provide access to the prototype learning systems and documentation to support the Evaluation Track team to conduct these studies.

### C.1.4. SCHEDULE FOR PROTOTYPING TRACK

- |   |                    |
|---|--------------------|
| o Applications to participate in Facilitated Team Development open: | August 29, 2019    |
| o Concept Notes submission begins:                                  | August 29, 2019    |
| o Applications to participate in Facilitated Team Development due:  | September 19, 2019 |
| o Invitations to join Facilitated Team Development:                 | October 2019       |
| o Concept Notes due:  | December 11, 2019  |
| o Feedback/Invitations to submit Full Proposals:                    | January 8, 2019    |
| o Full Proposals due:   | February 4, 2020   |
| o Notification of Award:  | February 18, 2020  |
| o Contract start date:  | May 1, 2020        |

All Application submissions are due on the respective due date by 4:00 p.m. PT.

### C.1.5. APPLICATION PROCESS FOR PROTOTYPING TRACK

The Prototyping Track includes the Integrate Path and the Build Path. Proposers may apply to a single path or

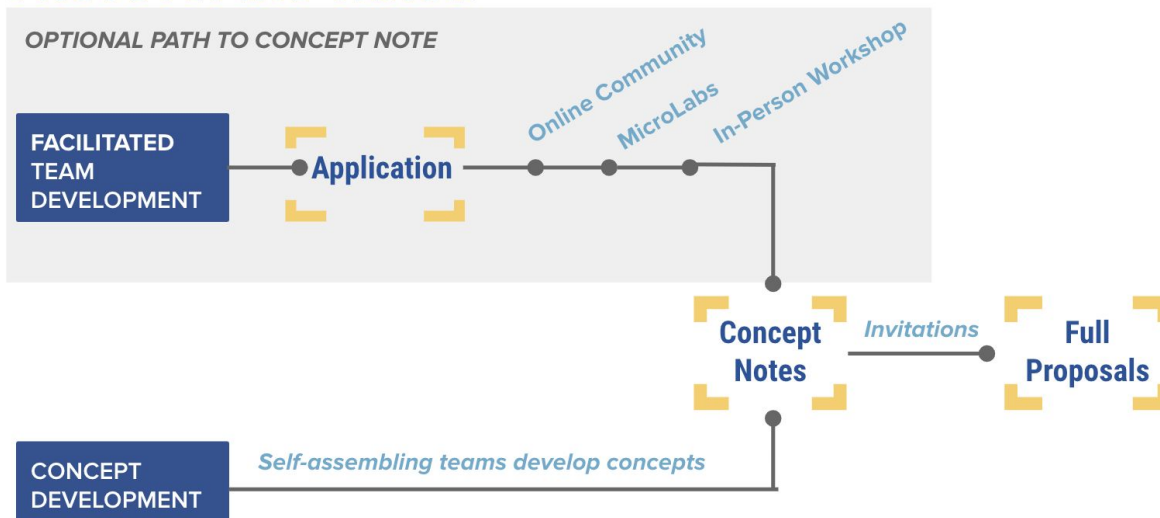
both paths; however, separate, non-duplicate proposal submissions are required for each path.

### Application to Participate in Facilitated Team Development

The EF+Math Program will fund and manage teams to design and develop prototype learning systems that embed EF training within high-quality math content and instruction. Teams are expected to be multi-disciplinary and to design for equity throughout their projects. Teams submitting Concept Notes through the Prototyping Track are expected to have all the necessary expertise to meet the stated objectives, and thus will necessarily be multi-disciplinary. To support individuals in connecting with potential collaborators and developing initial concepts, the EF+Math Program will provide facilitated opportunities to form teams. This Facilitated Team Development process is described below. Participation in the Facilitated Team Development process is not required in order to submit a Concept Note. The Facilitated Team Development process is intended to enable individuals to identify team members to form new collaborations, and thus is open to individuals only and not to teams. Content shared by the EF+Math Program through the Facilitated Team Development process will be made publicly available, for the benefit of self-assembling teams.

**Facilitated Team Development process:** The EF+Math Program will provide a series of supports - an online community, a series of virtual 'MicroLabs' and an in-person workshop (see **Fig 3**) - to support individual proposers in connecting with potential collaborators and developing initial concepts. By submitting an optional Facilitated Team Development application, individuals may be selected to participate in the process outlined below.

## PROTOTYPING TRACK



**Figure 3.** There are two paths to submitting a Concept Note: (1) self-assembling teams can proceed straight to Concept Note submission (lower path); (2) individuals wanting to identify team members can apply for a Facilitated Team Development process (upper path).

- **Online Community** (open early October 2019): Individuals selected to be part of the Facilitated Team Development process will be invited to participate in an online community where they can identify potential collaborators, make initial connections and begin to co-develop ideas.
- **Virtual MicroLabs** (October 2019, specific dates TBD): Three facilitated, virtual MicroLabs will provide individuals selected to participate in the Facilitated Team Development process with the opportunity to

begin engaging more deeply with potential collaborators around core aspects of the EF+Math Program and to connect with members of the Educator Leadership Council through small-group discussions.

- **In-person Workshop** (November 7-9, 2019 in Chicago): During this 2-day workshop, individuals selected to participate in the Facilitated Team Development process will begin to collaboratively develop their concepts and get feedback from Educator Leadership Council members and experts in the areas of math learning sciences, equity, executive function and program and product development. *Limited need-based travel awards will be available to support workshop attendance. Travel support may vary in amount and will be determined at the discretion of the EF+Math Program team. Please email [info@efmathprogram](mailto:info@efmathprogram) to request travel support.*

Application Instructions: To apply to participate in Facilitated Team Development, proposers must complete the application form [here](#). This form asks for contact information, applicant's expertise, applicant's experience as a collaborator and applicant's experience in designing for equity. The Facilitated Team Development process is intended to enable individuals to identify team members to form new collaborations, and thus is open to individuals only and not to teams.

Due Date: September 19, 2019

How submissions will be evaluated: Invitations to participate in Facilitated Team Development will be based on the relevance of the applicant's expertise to the EF+Math Program objectives, as well as the applicant's prior experience collaborating within multi-disciplinary teams and experience, approach and tangible progress in designing for equity.

How you will be notified of selection: The EF+Math Program team will respond to applications to participate in Facilitated Team Development to let individual applicants know whether they have been selected to participate in the EF+Math team development process. The anticipated response date is on or about October 3, 2019. Regardless of EF+Math Program's response to the application to participate in the Team Development Process, proposers may submit Concept Notes.

### **Concept Notes: Prototyping Track**

Proposers must submit Concept Notes to be considered for an invitation to submit Full Proposals. A Concept Note is essentially an executive summary of your proposal and is described below. While all awards will fund a proof of concept phase (Phase 1), Concept Notes should describe the full project's proposed objectives, expected results, benefits and impacts and project management and measurement plan for all phases described above. This will enable the EF+Math review team to provide rapid feedback on the proposal concept and minimize unnecessary effort.

**Proposers are encouraged to submit Concept Notes early.** Doing so will allow the EF+Math Program to provide the proposer early feedback and permit the Director and Deputy Director to engage with those teams where synergies may exist and a combined proposal may be desirable.

Application Instructions: Concept Notes are comprised of a Title, Contact Information, a Proposal limited to 2,500 words (~5 pages) and Attachments and Supporting Information. Concept Notes must be written in English and should be submitted using the following links:

- **Submit a Concept Note to the Prototyping Track Integrate Path** [here](#).
- **Submit a Concept Note to the Prototyping Track Build Path** [here](#).

Prototyping Track Concept Notes submissions must include the following information:

1. **TITLE:** The title of the proposed R&D effort.
2. **CONTACT INFORMATION:** Please provide contact information for the Lead PI and additional team members.
  - **Lead Principal Investigator's (PI) Name, Organization and Address:** The proposing lead PI's name, organization and contact information (phone number and email address).
  - **Names and Addresses of Additional Team Members:** Remaining team members' names and contact information. *Note that team members can be international, though the learning systems are required to be designed and developed in U.S. schools.*
  - **Administrative Point of Contact:** PI's Administrative point of contact (phone number and email address).
3. **PROPOSAL:** Concept Notes should spend approximately 700 words on each of the following three sections, not exceeding an aggregate of 2500 words (~5 pages):
  - A. **An innovative approach to developing and supporting students' executive function skills in the context of meaningful and challenging math, including a measurement approach that could establish promise and guide agile development.**
    - a. What is the specific problem that you are aiming to solve? What are the existing approaches to address this problem and what are the limits of these approaches?
    - b. What is innovative in your approach? Why do you believe your approach will achieve a breakthrough on the program goal?
    - c. What are the expected results and benefits, both in quantitative and qualitative terms?
  - B. **A rigorous R&D approach to equity, privacy and co-design that substantively involves teachers and students in historically under-resourced schools in ways that extend beyond simply testing or getting feedback from students and teachers.**
    - a. How will the program design for equity? How will stakeholders' personal, contextual experienced understanding of equity substantively shape your learning system?
    - b. How will the program design for rigorous student privacy and ensure ethical methods are employed throughout the R&D process?
  - C. **A team composition and management approach that can integrate multiple stakeholder insights, move from ideation to testable prototypes rapidly and iterate with agility towards the program goal.**
    - a. Why is your team best positioned to make the most of this unique funding opportunity? What expertise does the team bring to bear on the problem? How does the team's expertise and experience contribute to the team's ability to rapidly iterate and design for equity?

#### 4. ATTACHMENTS AND SUPPORTING INFORMATION

All attachment templates for the Prototyping Track Integrate Path can be downloaded [here](#).

All attachment templates for the Prototyping Track Build Path can be downloaded [here](#).

- **Project Plan (Project Activities and Duration):** Use the provided Project Plan template to explain how the objectives will be achieved, along with a summary of the planned activities to achieve the project objectives, who on the team will be performing each activity and the proposed time frame to accomplish them.

- **Measurement Plan:** Use the provided Measurement Plan template to explain how the project will be monitored and evaluated. Include the formative measures that will be used to inform prototype iteration and the summative measures that will be used to evaluate success. This should include proximal and distal measures of EF and math learning. The following required measures have already been populated in the plan template: EF Measures, Math Measures, Project Reach, and Unit Price Goal.
- **Summary Slide:** Use the provided Summary Slide template to provide a summary of the proposal that quickly and succinctly illustrates the concept overview, key innovations, expected impact and other unique aspects of the proposal.
- **Budget Estimate:** Provide a rough order of magnitude for the proposed research. Note that Indirect costs are limited to 15% of direct costs.

Due Date: December 11, 2019

How Concept Note submissions will be evaluated: Invitations to submit Full Proposals will be based on the following:

- Proposed effort's relevance to the EF+Math Program's overall objectives, responsiveness to the call for proposals and fit within the program portfolio
- A preliminary assessment of the scientific and technical merit of the proposed approach
- A preliminary assessment of the proposed effort's potential to support the intended beneficiaries and for wide-scale adoption by historically under-resourced schools
- A preliminary assessment of the proposed approach to designing for rigorous student privacy, and the ethical methods that will be employed throughout the R&D process
- Team composition, including the extent to which the team includes the necessary expertise and reflects the diversity of the schools and students the EF+Math Program aims to serve
- A preliminary assessment of the proposed approach to collaboration - both across the prototyping team and with District Co-Design Partners.
- Appropriate budget (Note that Indirect costs are limited to 15% of direct costs).

The EF+Math Program Director may contact potential proposers to further discuss their Concept Notes. This procedure is intended to minimize unnecessary cost and effort in proposal preparation and review.

How you will be notified of selection: After your Concept Note has been reviewed, you will receive notification either inviting submission of a detailed Full Proposal or letting you know that you are not encouraged to submit a Full Proposal.

For a Concept Note that propose efforts that are considered of particular value but either exceed available budgets or contain certain tasks or applications that are not desired, the EF+Math Program may suggest a Full Proposal with reduced effort to fit within expected available budgets. An invitation to submit a Full Proposal is not an assurance that a Full Proposal on the Concept Note's topic will ultimately be selected for contract award.

### **Full Proposals: Prototyping Track**

*Full Proposals will be requested by invitation only based on the results of Concept Notes review. Instructions for submission of Full Proposals and information regarding how they will be evaluated will be provided to invited parties. Proposals that were not expressly invited will not be considered for award.*

Anticipated Invitation and Due Date: Proposers should anticipate receiving feedback on Concept Notes and invitations to the Full Proposal phase on or about January 8, 2020. Invitations will include detailed instructions

for Full Proposals. We anticipate Full Proposals will be due February 4, 2020.

## **C.2 APPLIED RESEARCH TRACK**

While the Prototyping Track aims to develop teacher- and student-centered prototype learning systems, the Applied Research Track is specifically focused on technical developments that enhance the capabilities of the prototype learning systems. Technical innovations developed in the Applied Research Track are meant to be modular solutions that can work across multiple learning systems to be developed in the Prototyping Track.

At their core, the math and EF learning systems should provide useful and usable information to teachers on how students are learning math and how to optimally support students in learning challenging math. This may require technical innovations to make learning visible and actionable in real time. The goal is to help teachers provide more precise instruction tailored to individual students, especially in large classes. The goal of the Applied Research Track is to amplify the learning systems developed under the Prototyping Track, by developing technical innovations for integration into the learning systems.

To the extent that the learning systems developed in the Prototyping Track include technology to help build EF while learning math, the learning systems will be amplified by technical advances that make student learning visible to guide actionable next steps for learning. The goal is not to build technology for technology's sake, but rather to use technology where appropriate to support teachers in their ability to provide personalized, differentiated instruction to individual students even in large classes. Under the Applied Research Track, awardees will investigate novel approaches within two technical areas: *Making Learning Visible*, and *Making Learning Actionable*. After demonstrating initial success, advances made through the Applied Research Track will be integrated into the prototypes created by teams on the Prototyping Track *Build Path*, and where appropriate by teams on the Prototyping Track *Integrate Path*.

Proposers will develop novel approaches within various technical areas for improving the prototype learning systems developed under the Prototyping Track. These prototypes will likely require technology supports to make student learning visible to guide actionable next steps for learning. The goal is to help teachers provide effective instruction to individual students even in large classes. The goal of the Applied Research Track is to develop these technological innovations for integration into the learning systems developed under the Prototyping Track.

Teams funded under the Applied Research Track will be expected to share information and collaborate with other teams funded under the Applied Research Track, in addition to working with Prototyping Track teams to integrate their developed capacities into the prototype learning systems.

### **C.2.1. TECHNICAL AREA 1: MAKING LEARNING VISIBLE**

**Description:** We are seeking breakthrough methods to make visible the dynamic EF states of the learner, including: when student attention is focused on the task at hand, whether or not they are cognitively overloaded, whether distractions are keeping them from learning and more. Strong proposals will describe the technologies that can achieve this visibility, along with strategies to present this information to the student and teacher in ways that are informative and contribute to learning. All proposals will use rigorous privacy and security methods and practices to protect all data and will strictly adhere to relevant federal privacy laws and regulations. Proposals may draw from the fields of cognitive and affective computing, biometrics, bio-behavior modeling and more, with the strongest proposals including a plan for scale (i.e., ultimately using only the digital footprint from learning systems).



**Milestones:** Progress toward successful project completion will be assessed at the end of each phase based on the milestones in the table below. Proposers must provide a means of measuring success for each milestone as part of their proposal.

Milestones	Measure
<b>Phase 1 (18 months)</b> - Valid, reliable measures of ongoing EF states during math learning (in-lab).	TBD by Proposer
<b>Phase 2 (12 months)</b> - Successful transition from in-lab designs to in-school designs.	TBD by Proposer
<b>Phase 3 (12 months)</b> - Successful integration with learning systems developed in Prototyping Track.	TBD by Proposer

**Phasing:** Phase 1 has a duration of 18 months with a target start date of February 1, 2020. It comprises working with the Prototyping Track *Build* teams to understand the constraints of the proposed learning systems, identify the methods that will provide the most informative EF data and develop valid and reliable measures of ongoing EF states during math learning. If proposed measures include physiologic sensor data, sensor-based pilots will be confined to lab-based pilots only. Phase 2 has a duration of 12 months and comprises successful transition from sensor-based designs (in-lab) to sensor-free designs (in-school) in collaboration with the Prototyping Track *Build* teams. This phase likely includes physio-cognitive modeling to move from sensor to sensor-free methods. Phase 3 has a duration of 12 months and comprises improvement of the sensor-free measures and successful integration with the learning systems developed in the Prototyping Track *Build* path.

See **Fig 2** on page 6 for a graphical representation of the Making Learning Visible Technical Area of the Applied Research Track phases overlaid against the schedule for the Prototype Track and the academic year.

Funding for phases 2 and 3 will depend upon the outcomes achieved at each prior stage. The EF+Math Program Director will evaluate prototype performance against milestones described above to determine if a team has sufficiently met its goals to progress into the next phase.

**Anticipated Number of Phase 1 Awards:** Two (2) to Four (4) Awards

**Estimated Amount of Total Funding (Subject to Change):** \$3 million

**C.2.2. TECHNICAL AREA 2: MAKING LEARNING ACTIONABLE**

**Description:** The rationale for making learning visible is to guide actionable next steps to advance the learner through math learning progressions. Information about the dynamic EF states of the learner should be used to adapt the prototype learning systems in ways that allow for differentiated instruction for each learner. We are seeking approaches that adapt the learning progressions in the systems being built in the Prototyping Track based on the dynamic EF state of the learner. Proposals may draw from the fields of reinforcement learning, deep learning networks and more.

**Milestones:** Progress toward successful project completion will be assessed at the end of each phase based on the milestones in the table below. Proposers must provide a means of measuring success for each milestone as part of their proposal.

Milestones	Measure
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<p><b>Phase 1 (18 months) - Design Novel Feedback Loops:</b> Methods that successfully and sensibly advance the learner through closed-loop adaptive feedback based on existing EF measures.</p>	<p>TBD by Proposer</p>
<p><b>Phase 2 (12 months) - Develop Feedback Loops in Prototypes:</b> Methods that successfully and sensibly advance the learner based on EF fluctuations using measures developed by the Applied Research Making Learning Visible team(s).</p>	<p>TBD by Proposer</p>
<p><b>Phase 3 (12 months) - Successful Integration with Prototypes:</b> Successful integration of EF adaptivity with learning systems developed in Prototyping Track Build Path.</p>	<p>TBD by Proposer</p>

**Phasing:** Phase 1 has a duration of 18 months with a target start date of February 1, 2020. It comprises working with the Prototyping Track *Build* teams and the Applied Research Track Making Learning Visible team(s) to understand the constraints of the proposed learning systems, identify the types of existing EF and math measures that the learning systems might deploy and develop methods that will keep learners at the edge of their mastery through continuous, closed-loop feedback based on those EF and math measures. These methods could include advances in machine learning/AI and/or deep neural networks to determine how to advance the learner through more challenging EF and math training. Phase 2 has a duration of 12 months and comprises the development of methods that successfully and sensibly advance the learner based on the valid, reliable measures of ongoing EF states during math learning developed and tested by the Applied Research Track Making Learning Visible team. Phase 3 has a duration of 12 months and comprises successful integration of EF adaptivity with the learning systems being developed in the Prototyping Track *Build* Path.

See the schedule in **Fig 2** (on page 6) for a graphical representation of the Making Learning Actionable Technical Area of the Applied Research Track phases overlaid against the schedule for the Prototype Track and the academic year.

Funding for phases 2 and 3 will depend upon the outcomes achieved at each prior phase. The EF+Math Program Director will evaluate prototype performance against milestones described above to determine if a team has sufficiently met its goals to progress into the next phase.

**Anticipated Number of Phase 1 Awards:** Two (2) to Four (4) Awards

**Estimated Amount of Total Funding (Subject to Change):** \$2.5 million

### C.2.3. MEASURING SUCCESS IN APPLIED RESEARCH TRACK

Outputs from the Applied Research Track are intended to be modular, generalizable capacities that amplify the effectiveness of the prototype learning systems developed in the Prototyping Track. Proposers in the Applied Research Track must provide a means of measuring success for each milestone as part of their proposal. Note that independent evaluations of the prototype learning systems will be conducted at the level of the overall prototype, not on the individual components (such as those developed in the Applied Research Track).

#### C.2.4. SCHEDULE FOR APPLIED RESEARCH TRACK

o Concept Notes submission begins:	August 29, 2019
o Concept Notes due:	October 3, 2019
o Feedback /Invitations to submit Full Proposals:	October 17, 2019
o Full Proposals due:	November 14, 2019
o Notification of Award:	December 4, 2020
o Contract start date:	February 1, 2020

All Application submissions are due on the respective due date by 4:00 p.m. PT.

#### C.2.5. APPLICATION PROCESS FOR APPLIED RESEARCH TRACK

##### Concept Notes: Applied Research Track

Proposers are required to submit Concept Notes in advance of Full Proposals. A Concept Note is essentially an executive summary of your proposal and is described below. All awards will start with a proof of concept phase (Phase 1); however, Concept Notes should describe the full project's proposed objectives, expected results, benefits and impacts and project management and evaluation plan for all phases described above. This will enable the EF+Math review team to provide rapid feedback and minimize unnecessary effort.

Proposers are encouraged to submit Concept Notes early. Doing so will allow the EF+Math Program to provide the proposer early feedback and permit the Program Director and Deputy Program Director to engage with those teams where synergies may exist and a combined proposal may be desirable.

Application Instructions: Concept Notes are limited to 2,500 words (~5 pages) not including Attachments and Supporting Information, must be written in English and should be submitted using the following links:

- **Submit a Concept Note to the Applied Research Track Technical Area 1: Making Learning Visible** [here](#).
- **Submit a Concept Note to the Applied Research Track Technical Area 2: Making Learning Actionable** [here](#).

Applied Research Track Concept Notes submissions must include the following information:

- 1. TITLE:** The title of the proposed research effort.
- 2. CONTACT INFORMATION:** Please provide contact information for the Lead PI and additional team members.
  - **Lead Principal Investigator's (PI) Name, Organization and Address:** The proposing lead PI's name, organization and contact information (phone number and email address)
  - **Names and Addresses of Additional Team Members:** Remaining team members' names and contact information. *Note that team members can be international, though the learning systems are required to be designed and developed in U.S. schools.*
  - **Administrative Point of Contact:** PI's Administrative point of contact (phone number and email address)

**3. PROPOSAL. Concept Note proposals are limited to 2,500 words (~5 pages) and must include the following):**

- **Background:** Describe the specific problem that you are aiming to solve. What are the existing approaches to address this problem and what are the limits of these approaches? Please be sure to include whether your technical innovation will address math, executive function, or both.
- **Project Objectives, Approach and Innovation:** Describe the project objectives and the innovation that will occur as a result of this project. What is your approach? What is innovative or new in your approach and why do you think it will be successful?
- **Benefits and impacts:** The expected benefits, both in quantitative and qualitative terms, and when and where they will occur; the underlying assumptions and the reasons why these benefits can be expected for a specific group of beneficiaries; considerations concerning how and by whom the impacts will be assessed.
- **Ethics and student privacy:** Describe how the technical innovation will design for rigorous student privacy and will ensure ethical methods are employed throughout the R&D process.
- **Designing for equity:** Describe how the technical innovation will design for equity, specifically to ensure that the work is culturally and contextually responsive to learning environments that serve students in historically under-resourced schools.
- **Team expertise:** What expertise does the team bring to bear on the problem? How does the team's expertise and experience contribute to the team's ability to design for equity?

**4. ATTACHMENTS AND SUPPORTING INFORMATION**

All attachment templates for Technical Area 1: Making Learning Visible can be downloaded [here](#).

All attachment templates for Technical Area 2: Making Learning Actionable can be downloaded [here](#).

- **Project Plan (Project Activities and Duration):** Use provided Project Plan template to explain how the objectives will be achieved, along with a summary of the planned activities to achieve the project objectives, who on the team will be performing each activity and the proposed time frame to accomplish them.
- **Measurement Plan:** Use provided Measurement Plan template to explain how the project will be monitored and evaluated.
- **Summary Slide:** Use the provided Summary Slide template to provide a summary of the proposal that quickly and succinctly illustrates the concept overview, key innovations, expected impact and other unique aspects of the proposal.
- **Budget Estimate:** Provide a rough order of magnitude for the proposed research. Note that Indirect costs are limited to 15% of direct costs.

Due Date: October 3, 2019

How submissions will be evaluated: Invitations to submit Full Proposals will be based on the following:

- Proposed effort's relevance to the EF+Math objectives, responsiveness to the call for proposals and fit within the portfolio
- A preliminary assessment of the scientific or technical merit of the proposed approach
- A preliminary assessment of the proposed approach to designing for rigorous student privacy, and the ethical methods that will be employed throughout the R&D process
- Team composition, including the extent to which the team includes the necessary expertise and reflects the diversity of the schools and students the EF+Math program aims to serve.

The EF+Math Program Director may contact potential proposers to further discuss their Concept Notes. This procedure is intended to minimize unnecessary cost and effort in proposal preparation and review.

How you will be notified of selection: After your Concept Note has been reviewed, you will receive notification either inviting submission of a detailed Full Proposal or letting you know that you have not been selected to submit a Full Proposal.

For Concept Notes that propose efforts that are considered of particular value but either exceed available budgets or contain certain tasks or applications that are not desired, the EF+Math Program may suggest a Full Proposal with reduced effort to fit within expected available budgets. An invitation to submit a Full Proposal is not an assurance that a Full Proposal on the Concept Notes' topic will ultimately be selected for contract award.

### **Full Proposals: Applied Research Track**

*Full Proposals will be requested by invitation only based on the results of Concept Notes review. Instructions for submission of Full Proposals and information regarding how they will be evaluated will be provided to invited parties. Proposals that were not expressly invited will not be considered for award.*

### Anticipated Invitation and Due Date:

Proposers should anticipate receiving feedback and invitations to the Full Proposal phase on or about October 17, 2019. We anticipate Full Proposals will be due November 14, 2019.

## **D. Conforming Submissions**

The EF+Math Program will review each conforming submission. Conforming submissions comply with all requirements detailed in this solicitation; submissions that fail to do so may be deemed non-conforming and may be removed from consideration. Conforming proposals will be reviewed by content matter experts. EF+Math Program policy is to ensure impartial, equitable comprehensive review of all conforming submissions to select those that meet program goals.

## **E. Communications between EF+Math Program Staff and Proposers**

The EF+Math Program endeavors to be transparent about how it determines which teams will receive funding. To this end, EF+Math Program staff, to include the Director, Deputy Director, and Technical Reviewers, may communicate with all interested parties, to include proposers, potential proposers and the research community at large throughout the entire solicitation, selection and award process. Such communications shall not reveal one proposer's solution to another nor shall such communications provide an unfair competitive advantage to any party. Communications that clarify some aspect of this solicitation or are otherwise informative to all proposers will be shared broadly with the community at large by posting on the EF+Math Program website in response to a Frequently Asked Question (FAQ) and/or by amending the solicitation.

Questions may be sent to [proposals@efmathprogram.org](mailto:proposals@efmathprogram.org). Responses to frequently asked questions will be posted to the EF+Math Program Website: [www.efmathprogram.org](http://www.efmathprogram.org)

## F. Programmatic Support

The EF+Math Program will provide the following programmatic support to proposers:

- *Team Development Support*: To support individuals in connecting with potential collaborators and developing initial concepts for the Prototyping Track, the EF+Math Program will provide [facilitated opportunities](#) to form teams.
- *Literature Primers*: To support proposers in bringing insights from learning science research to bear on challenges faced in real-world classrooms, the EF+Math Program will provide literature primers on core aspects of the program - EF, math and equity.

Additionally, the EF+Math Program will provide programmatic support to funded teams, including:

- *Observational Insights*: The EF+Math Program will provide summary insights from observational research conducted during the 2019-2020 school year in grades 3-8 math classrooms in historically under-resourced schools. Insights from this study will provide funded teams with a deeper understanding of the various contexts, assets, affordances and constraints of real-world classrooms in order to inform the design and implementation of prototype learning systems.
- *Access to Educator Leadership Council and District Co-Design Partners*: Teams funded through the Prototyping Track *Build Path* are not expected to identify school partners or educator co-design partners; EF+Math Program staff will recruit district partners and educators through the [Designing for Use Track](#), and facilitate collaboration between funded teams and district partners/educators. Prototyping Track *Build Path* proposers who would like to continue working with their existing district partners can do so; however, prototyping teams will be funded to partner with new districts or schools selected through the Designing for Use Track.
- *Institutional Review Board (IRB) Approval Support*: If proposers do not have an appropriate IRB available or cannot attain their IRB approval in a reasonable amount of time, the EF+Math Program will provide an independent IRB.
- *Technical Assistance*: The EF+Math Program will provide technical assistance to the Prototype teams to strengthen the iterative development studies described in the proposals, including best strategies for testing components of the new systems; the design of instruments to gather student and teacher feedback on the systems; selection and/or creation of measures of EF and math skills to be used by all prototype teams; and preparation of datasets for use in future analyses.
- *Team Training*: To the extent that teams are determined to need improved capacities to be successful, e.g., in privacy by design or equity by design practices, the EF+Math Program will provide trainings for all teams.

## G. Proprietary Information

Facilitated Team Development applications and Concept Notes should NOT include proprietary information. Submissions will be reviewed to determine the applicant's ability to be a successful partner in the EF+Math

Program, and thus do not require sharing proprietary information at these preliminary stages. Teams invited to submit Full Proposals will have the opportunity to share their proprietary information with the EF+Math Program staff; all proposals are held confidentially (see **H. Handling of Proposal Information** below).

## **H. Handling of Proposal Information**

EF+Math Program policy is to not disclose contents of proposal submissions except as described in this paragraph to authorized personnel. Restrictive notices notwithstanding, submissions may be handled by employees of the EF+Math Program, consultants under contract to the EF+Math Program and professional peers in the scientific and education communities for administrative purposes and/or to assist with proposal evaluation. All personnel performing this role are expressly prohibited from competing for support under the Prototyping and Applied Research Tracks of the EF+Math Program and are bound by rigorous nondisclosure agreements.

## **I. Diversity Policy**

We value diversity, equity and inclusion in every part of our work. Strong teams will have the necessary expertise (differs by track) and will represent the racial, ethnic and gender balance of the students we aim to serve. Further, we partner with educators who work with students who have been traditionally underserved to ensure the approaches that are developed will empower students, affirm their innate abilities and provide conditions for them to tap into their agency.

Our inclusive R&D approach brings researchers, developers and educators together to co-design practical solutions that prioritize the voices and lived experiences of the teachers and students we aim to serve.

We are committed to:

- Building and funding teams that represent the racial, ethnic and gender balance of the students we aim to serve
- Collaboratively engaging a range of researchers, educators, technology professionals and community advocates in ways that build upon our collective expertise
- Holding all funded teams accountable to the principles of targeted universalism, which designs strategies for specific groups of students to achieve universal goals, in their development and evaluation.

## **J. Intellectual Property**

Teams selected for funding under the EF+Math Program will retain ownership of their intellectual property or technical data/computer software developed under EF+Math Program contracts. The EF+Math Program will acquire, subject to applicable laws and for the purpose of achieving Global Access, a nonexclusive, perpetual, irrevocable, worldwide, royalty-free, fully paid up, sublicensable license to make, use, sell, offer to sell, import, distribute, copy, create derivative works, publicly perform and display: Funded Developments and Essential Background Technology.

“Funded Developments” are any and all processes, technologies, materials, software, data or other innovations resulting from the program including modifications, improvements and further developments to Essential Background Technology. Essential Background Technology includes any and all products, services, processes,

technologies, materials, software, data or other innovations that are created or licensed by the performer and are either incorporated into a Funded Development or reasonably required to exercise a license to the Funded Developments.

“Essential Background Technology” means Background Technology that is (i) owned, controlled or developed by the Performer, or in-licensed with the right to sublicense; and (ii) either incorporated into a Funded Development or reasonably required to exercise the license to Funded Developments. The Performer confirms that the Performer has retained sufficient rights in the Funded Developments and Essential Background Technology to grant this license. The Performer must ensure this license survives the assignment or transfer of Funded Developments or Essential Background Technology. On request, the Performer must promptly make available the Funded Developments and Essential Background Technology to the EF+Math Program for use solely under this license. If the Performer demonstrates to the satisfaction of the EF+Math Program that Global Access can best be achieved without this license, the EF+Math Program and the Performer will make good faith efforts to modify or terminate this license, as appropriate.

It is the EF+Math Program’s intent to exercise this license only in the event it determines the performer is not meeting the Global Access commitments. The EF+Math Program’s Global Access policy requires that (a) generalizable knowledge and information gained from programs and projects be promptly and broadly disseminated, (b) intellectual property that may be required for downstream products be protected and the aforementioned license be provided to the EF+Math Program, (c) any products that incorporate Funded Developments are offered to and can be afforded by schools, districts, and programs that serve our intended beneficiaries, namely historically underserved students, and (d) product reports be provided for assessment purposes.

If proposers desire to use proprietary computer software or technical data or both as the basis of their proposed approach, in whole or in part, they should: (1) clearly identify such software/data and its proposed particular use(s); (2) explain how the EF+Math Program will be able to reach its program goals (including transition) within the proprietary model offered; and (3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost under the proposed proprietary solution. Proposers expecting to use, but not to deliver, commercial open source tools or other materials in implementing their approach may be required to indemnify EF+Math Program and the NewSchools Venture Fund against legal liability arising from such use.

All proposers must provide a good faith representation of either ownership or possession of appropriate licensing rights to all other intellectual property to be used for the proposed project. Proposers must provide a short summary for any intellectual property that is part of a Funded Development or Essential Background Technology that will not be afforded to the EF+Math Program in accordance with the license described above. Such summary must describe the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research. Failure to make intellectual property associated with all Funded Developments or Essential Background Technology available to the EF+Math Program via the aforementioned license may result in the proposal not being selected for award.

Product Reports: Teams funded under the EF+Math Program who develop and take to market products that use Funded Developments will report on their progress in serving the U.S. education system and in reaching students in historically under-resourced schools, for five years after the conclusion of the contract. They will provide the following information to the EF+Math Program:

- A description of how these products’ content and approach reflect the requirements of historically



- underserved students and the affordances and constraints of the schools and educators who serve them
- ❑ A description of the organization/team's efforts to reach schools and districts that serve high percentages of historically underserved students, through marketing, sales, pricing and distribution strategies, including the company's plan to reach a nationally representative proportion of these students
  - ❑ Their pricing for products that use the Funded Developments, including their pricing structure (e.g., software licenses, subscriptions and/or support services), with special note of any differentiated pricing designed to ensure their products are affordable to under-resourced schools and districts.
  - ❑ The reach and demographics of the students who are using these products, including the percentage of historically underserved students.

The purpose of these reports is to help the EF+Math Program assess the degree to which the program is achieving its ultimate goal of providing effective new capabilities for historically underserved students. The EF+Math Program intends to encourage innovation in the ecosystem and encourage organizations to bring products to market that further the mission of the program. These reports are for internal use by the EF+Math Program and its major funders only and will not be shared publicly, in order to protect company/organization-sensitive information. For more details please see the EF+Math Program Global Access Strategy [here](#).

#### **K. Human Subjects Research (HSR)**

The EF+Math Program involves human subjects research. Full Proposals must include details of the Institutional Review Board (IRB) approval process, to include the name of the IRB and anticipated IRB approval schedule. If proposers do not have an appropriate IRB available or cannot attain their IRB approval in a reasonable amount of time, the EF+Math Program can provide an independent IRB.

#### **L. Modifications**

The EF+Math Program reserves the right to issue changes to this Call for Proposals. Likewise, because the EF+Math Program is charting new territory in its programmatic approach and focus, the tasks, phasing, periods of performance, milestones/metrics and associated levels of funding for individual program awards are all subject to change as we make new discoveries. Such changes may result in modifications to program awards. The EF+Math Program staff will have substantial involvement in the projects and may decide to redirect work; therefore, modifications may be initiated by the EF+Math Program staff or be requested by the performing team and approved at the discretion of EF+Math Program staff. Program awards will include specific language detailing how modifications will be made.