EF+Math Program

supported by aerdf

"People, Process, and Prototype" Goals for R&D Teams

Description

These resources are provided as an example of the Establishing Foundations Key Action: "Define explicit actions and reflection practices that help you reach your equity goals." The slide deck presents the "People, Process, and Prototype" goals for R&D teams, by phase/year of the program.

The EF+Math Program's breakthrough goal was to:

> *"Demonstrate the potential to dramatically improve math outcomes for students in grades 3–8, with a focus on Black and Latinx students, and students of all races experiencing poverty, by strengthening the core assets every student has — executive function (EF) skills."*

The EF+Math Program was built based on a fundamental premise: creating equitable learning products (i.e., prototypes) that achieve this breakthrough goal requires equitable research and development processes. Thus, EF+Math wanted to communicate to R&D teams that, while product development is important, *it is also important that this be done within an Inclusive R&D framework*. This is the origin of the "People, Process, Prototype" goals that EF+Math set for each year of the program. The EF+Math team endeavored to create both shared understanding and shared accountability with respect to Inclusive R&D practices.

"Prototype Goals" reference the development of mature prototypes (and later, fully developed products) that improve math outcomes and strengthen EF skills. "Process Goals" reference the Inclusive R&D processes and practices that need to be enacted to make this happen. "People Goals" reference the cultivation of relationships, the evolution of mindsets related to equity, and the building of this community of values-aligned individuals.

The slides below are part of a presentation to R&D teams in December 2022 (Phase 3 of the program), and walks through the rationale for the "People, Process, Prototype" goals, as well as a clear articulation of these goals for the R&D teams.

EF+Math

"People, Process, and Prototype" Goals for R&D Teams

Last updated 12/06/2022

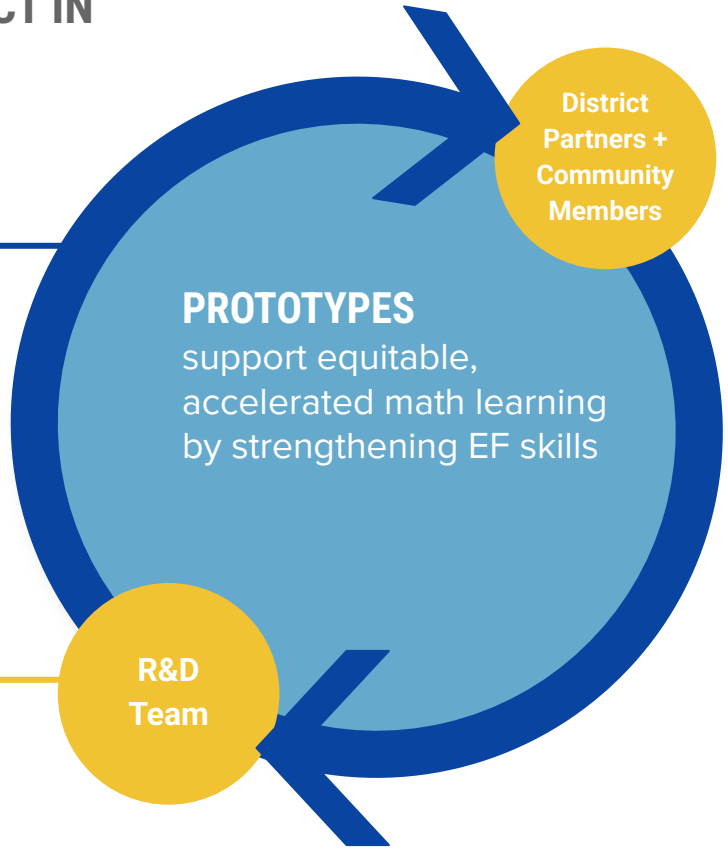
OUR THEORY OF ACTION

Our theory of action is that through Inclusive R&D, equitable **Processes** and teams of equity-centered and engaged **People** will develop innovative **Prototypes** that create transformative gains in outcomes for Black and Latinx students and students experiencing poverty, and ultimately all students.

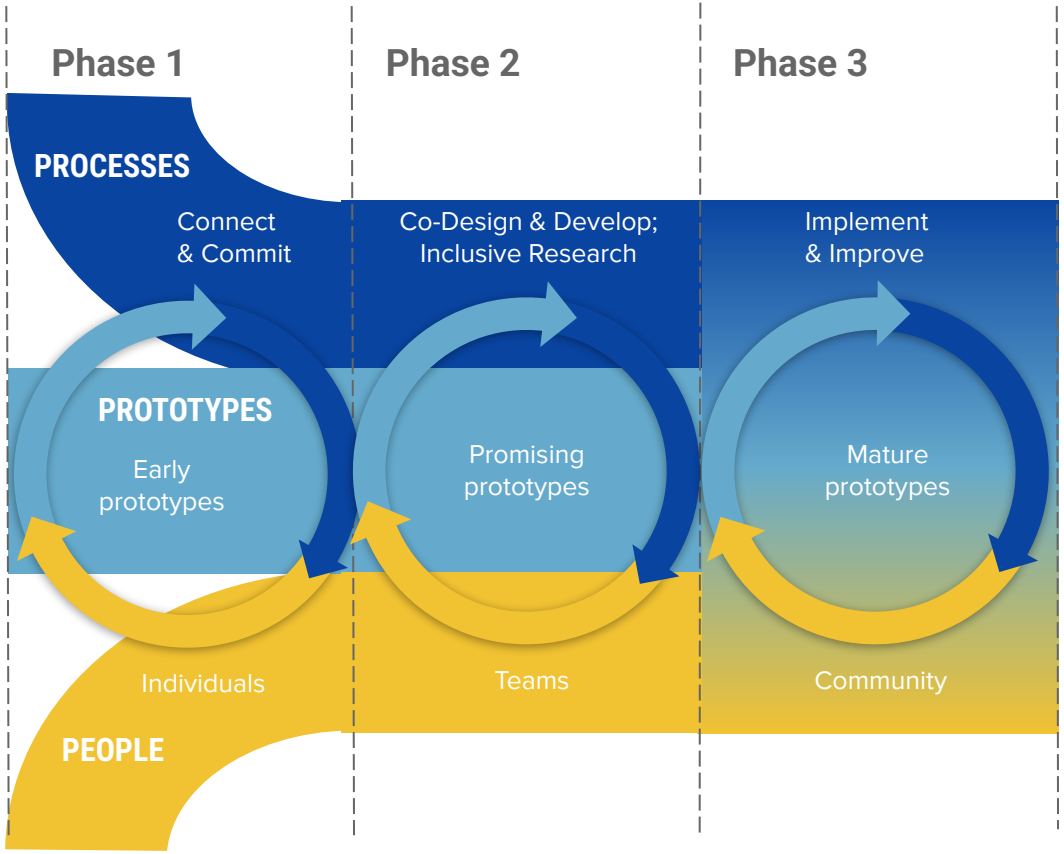
WE MEASURE IMPACT IN 3 KEY AREAS:

PROCESSES
enable inclusive, equity-centered R&D

PEOPLE
engage authentically and collaboratively in equity-centered approaches



We track outputs and outcomes in each phase, designed to lead to our 5 year intended impact.



OUR INTENDED IMPACT
(5 Years)

A tested model for how to do inclusive, equity-centered R&D, captured and shared by the community

Mature prototypes that dramatically improve math outcomes for Black and Latinx students and students living in poverty by strengthening executive functions skills

A community of advocates that model Inclusive R&D and demonstrate the value of centering equity and embedding EF strengthening within math learning

Phase 3
Intended Impact

In Phase 3, we aim to make significant progress towards the **development, implementation, and pilot testing of mature prototypes** that have been developed through **inclusive, equitable, and iterative R&D processes** and that have been developed by **team members who model and value** those processes.

5-Year
Intended Impact

A tested model for how to do inclusive, equity-centered R&D, captured and shared by the community

Mature prototypes that dramatically improve math outcomes for Black and Latinx students and students living in poverty by strengthening executive functions skills

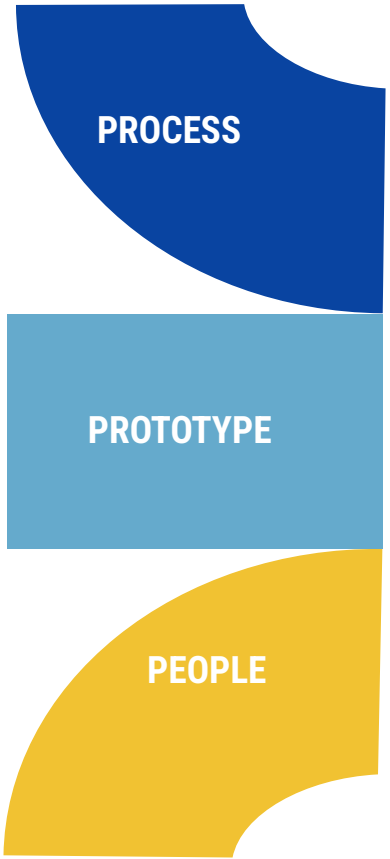
A community of advocates that model Inclusive R&D and demonstrate the value of centering equity and embedding EF strengthening within math learning

Prototyping Track

Phase 1

Prototyping Track Desired Outputs

We track outputs and outcomes aligned with our intended impact



PROCESS

- Defined equity commitments and a structure for periodically reflecting on them
- R&D plan that is equity-centered, co-developed and co-owned by entire team
- Evidence of continuous improvement made with input from all stakeholders

PROTOTYPE

- Evidence of accessibility for priority student user groups
- Evidence of usability with teachers and students
- Improved logic model documenting theory of change.

PEOPLE

- Established network of community members
- Engagement with critical racial equity knowledge and cultural fluency
- Increasing understanding of the intersections between EF, Math, and Equity

** Priority students are Black and Latinx students, and students experiencing poverty*

Phase 2

Prototyping Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PROCESS	• Evidence that design decisions are made through a transparent process in which educator and student voices are valued and prioritized • Clearly defined research questions and progress indicators that are culturally informed and created through a transparent process with input from the entire co-design team • Demonstrated strong relationships, trust, and open communication across the co-design team, including regular sharing of learnings with key stakeholders (co-design team, students, parents, community members)
PROTOTYPE	• Evidence of improved usability and accessibility for priority student user groups • Evidence of feasibility for classroom use • Early indicators of improved student EF and math outcomes
PEOPLE	• Continued development of relationships and collaborations across individuals and teams • Deepened engagement with critical racial equity knowledge and cultural fluency • Increased demonstrated knowledge of the intersections between EF, Math, and Equity

** Priority students are Black and Latinx students, and students experiencing poverty*

Phase 3

Prototyping Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PROCESS

PROTOTYPE

PEOPLE

Inclusive research and development	• Research and development decisions are made through a transparent process in which voices of educators and students (specifically those who identify as Black and Latinx students, or as students experiencing poverty) are valued and prioritized. • Demonstrated strong relationships, trust, and open communication with the co-design team and key stakeholders (e.g., educators, students, advisors).
Equity-centered research and development	• Implementation models are co-designed to be optimized for Black and Latinx students and students experiencing poverty, and center the student experience. • Data is collected, analyzed, and interpreted using methodologies and instruments that are culturally informed and developed with community input.
Iterative research and development	• Prototypes are developed through rounds of inclusive and iterative development • Findings from each research cycle feed into future rounds of prototype development
Dissemination of learnings	• Learnings are shared within the EF+Math community (e.g., working groups, white papers, community learning events) • Project learnings are shared with a variety of communities and codesign partners make substantial contributions to dissemination efforts
Mature prototypes	• Development of mature prototypes that include all necessary components (e.g., training or technology). • Evidence that prototypes promote development of executive function skills and conceptual understanding and multi-step problem solving in mathematics. • Evidence that prototypes have been designed for Black and Latinx students and students experiencing poverty. • Demonstration of improvements made to the accessibility, usability, and feasibility of the prototypes.
Implementation of prototypes	• Demonstration of prototype implementation across varied learning environments. • Identification of implementation conditions that are most critical to improving student outcomes.
Promising pilot study results	• Findings show indicators of promise in improving both executive function and math outcomes on either researcher-developed or standardized measures for Black and Latinx students and students experiencing poverty. • Sample includes at least 10 teachers and their students who will use the prototype. The student sample should include 70% or more Black and Latinx students and students experiencing poverty.
Development of team members	• Engagement in and creation of opportunities for team members to develop critical racial equity knowledge and cultural fluency (e.g., through learning sessions, trainings, readings) • Capacity building for team members around the intersection of executive functions, equity, and math • Continued development of relationships and collaborations across individuals and teams with different expertise

Phase 3

Prototyping Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PROCESS

Inclusive research and development	• Research and development decisions are made through a transparent process in which voices of educators and students (specifically those who identify as Black and Latinx students, or as students experiencing poverty) are valued and prioritized. • Demonstrated strong relationships, trust, and open communication with the co-design team and key stakeholders (e.g., educators, students, advisors).
Equity-centered research and development	• Implementation models are co-designed to be optimized for Black and Latinx students and students experiencing poverty, and center the student experience. • Data is collected, analyzed, and interpreted using methodologies and instruments that are culturally informed and developed with community input.
Iterative research and development	• Prototypes are developed through rounds of inclusive and iterative development • Findings from each research cycle feed into future rounds of prototype development
Dissemination of learnings	• Learnings are shared within the EF+Math community (e.g., working groups, white papers, community learning events) • Project learnings are shared with a variety of communities and codesign partners make substantial contributions to dissemination efforts

** Priority students are Black and Latinx students, and students experiencing poverty*

Phase 3

Prototyping Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PROTOTYPE

Mature prototypes	• Development of mature prototypes that include all necessary components (e.g., training or technology). • Evidence that prototypes promote development of executive function skills and conceptual understanding and multi-step problem solving in mathematics. • Evidence that prototypes have been designed for Black and Latinx students and students experiencing poverty. • Demonstration of improvements made to the accessibility, usability, and feasibility of the prototypes.
Implementation of prototypes	• Demonstration of prototype implementation across varied learning environments. • Identification of implementation conditions that are most critical to improving student outcomes.
Promising pilot study results	• Findings show indicators of promise in improving both executive function and math outcomes on either researcher-developed or standardized measures for Black and Latinx students and students experiencing poverty. • Sample includes at least 10 teachers and their students who will use the prototype. The student sample should include 70% or more Black and Latinx students and students experiencing poverty.

** Priority students are Black and Latinx students, and students experiencing poverty*

Phase 3

Prototyping Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PEOPLE

Development of team members	• Engagement in and creation of opportunities for team members to develop critical racial equity knowledge and cultural fluency (e.g., through learning sessions, trainings, readings) • Capacity building for team members around the intersection of executive functions, equity, and math • Continued development of relationships and collaborations across individuals and teams with different expertise

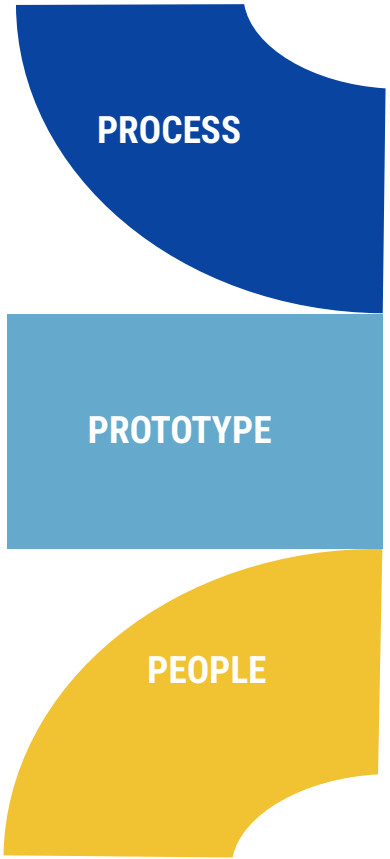
** Priority students are Black and Latinx students, and students experiencing poverty*

Applied Research Track

Phase 1

Applied Research Track Desired Outputs

We track outputs and outcomes aligned with our intended impact



PROCESS

- Development process in alignment with EF+Math's equity guiding principles
- Evidence of continuous improvement made with input from all stakeholders
- Progress towards successful collaboration with EF+Math Prototyping Track Team(s)

PROTOTYPE

- Making Learning Visible -- Valid, reliable measures of ongoing EF states during math learning (in-lab)
- Making Learning Actionable -- Novel methods that keep students at the edge of their mastery through continuous, closed-loop feedback.

PEOPLE

- Established network of community members
- Engagement with critical racial equity knowledge and cultural fluency
- Increasing understanding of the intersections between EF, Math, and Equity

** Priority students are Black and Latinx students, and students experiencing poverty*

Phase 2

Applied Research Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PROCESS	• Development process in alignment with EF+Math's equity guiding principles • Evidence of continuous improvement made with input from all stakeholders • Progress towards successful collaboration with EF+Math Prototyping Track Team(s)
PROTOTYPE	• Making Learning Visible -- Demonstrate a successful transition from in-lab designs to in-school designs • Making Learning Actionable -- Methods that successfully and sensibly advance the learner based on EF fluctuations using measures developed by the Applied Research Making Learning Visible team(s)
PEOPLE	• Continued development of relationships and collaborations across individuals and teams • Deepened engagement with critical racial equity knowledge and cultural fluency • Increased demonstrated knowledge of the intersections between EF, Math, and Equity

** Priority students are Black and Latinx students, and students experiencing poverty*

Phase 3

Applied Research Track Desired Outputs

We track outputs and outcomes aligned with our intended impact

PROCESS

PROTOTYPE

PEOPLE

Development process in alignment with EF+Math's equity guiding principles	• Evidence that tools have been designed for Black and Latinx students and students experiencing poverty. • Data is collected, analyzed, and interpreted using methodologies that are centered in equity.
Iterative development & improvement	• Evidence of continuous improvement made to tools with input from key stakeholders (e.g., educators, students, advisors) • Tools are developed through rounds of iterative development where findings from each research cycle feed into future rounds of development
Productive Collaboration with EF+Math Prototyping Track Team	• Demonstrated strong relationship, trust, and open communication built with a Prototyping Track team
Dissemination of learnings	• Learnings are shared within the EF+Math community (e.g., working groups, white papers, community learning events) • Project learnings are shared with a variety of communities and codesign partners make substantial contributions to dissemination efforts
Prototype Development	• Making Learning Visible: Development of improved tools that provide valid, reliable measures of ongoing EF states during math learning. • Making Learning Actionable: Development of improved methods that keep students at the edge of their mastery through continuous, closed-loop feedback. • Demonstration of improvements made to the accessibility, usability, and feasibility of the tools/methods
Prototype Integration	• Successful collaboration with one or more Prototyping Track teams, resulting in either the integration of tools into a Prototyping Track learning system or the significant influence of the tool on a Prototyping Track learning system.
Development of team members	• Engagement in and creation of opportunities for team members to develop critical racial equity knowledge and cultural fluency (e.g., through learning sessions, trainings, readings) • Capacity building for team members around the intersection of executive functions, equity, and math • Continued development of relationships and collaborations across individuals and teams with different expertise