



NASA/US Department of Education Collaboration State Briefing

March 16, 2016

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Overview

- A partnership between NASA and the U.S. Department of Education's 21st Century Community Learning Centers
- The collaboration will support the expansion of STEM opportunities for students across the country
- Sites will test a series of design challenges and science investigations for middle school students that will enable them to develop solutions to real world science and engineering problems faced by NASA scientists, engineers and astronauts today



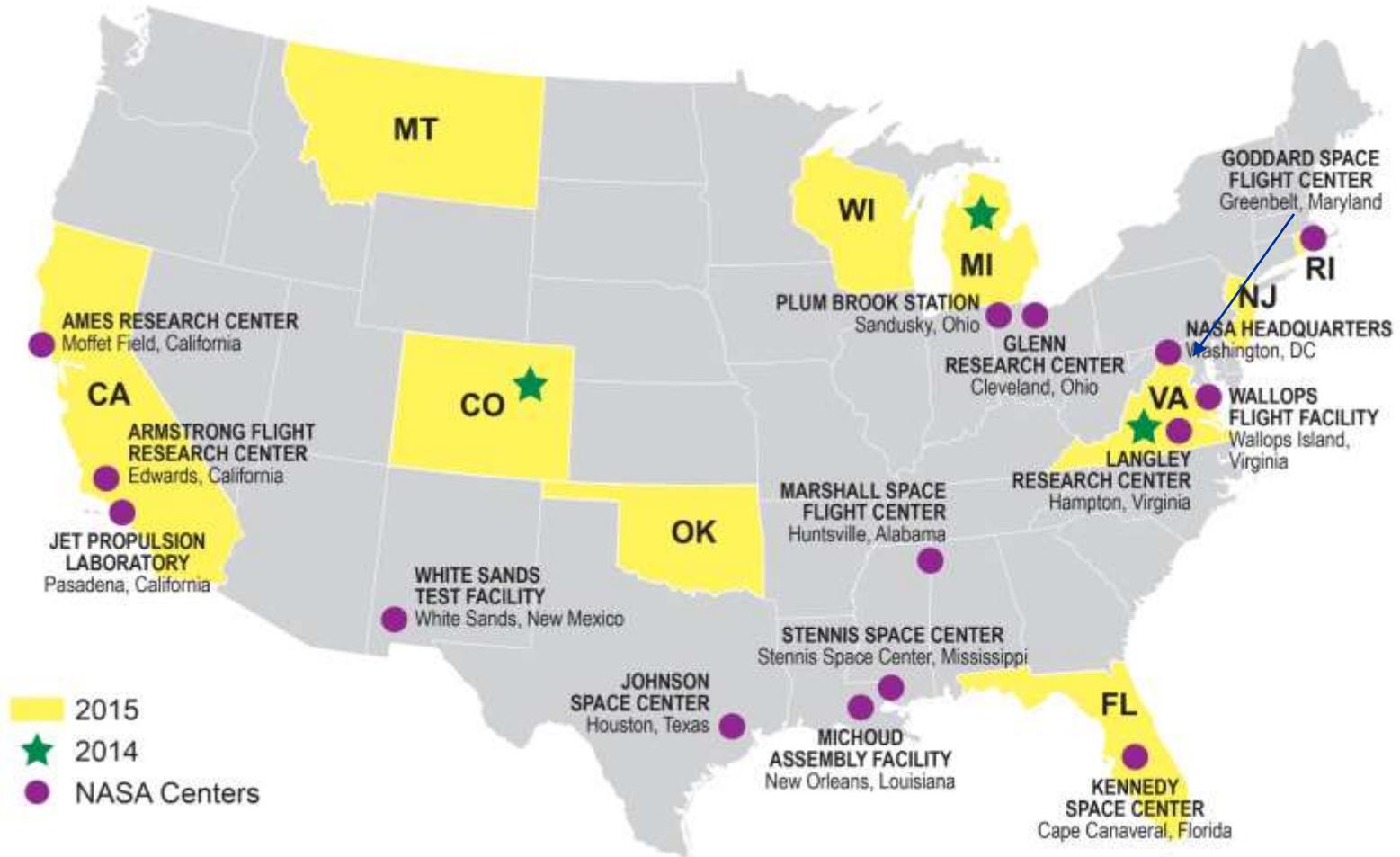
Project objectives

- Provide students with an opportunity to engage in project-based learning before, during, and after school where –
 - Scientists and engineers mentor students in ways that motivate and engage;
 - Federal agencies partner to create new opportunities that are not possible when agencies work in silos;
 - Funds are leveraged to offer high-quality STEM education to students;
 - Teachers learn new knowledge and teaching strategies to support students.
- Create STEM resources and materials that can be disseminated and used by anyone.



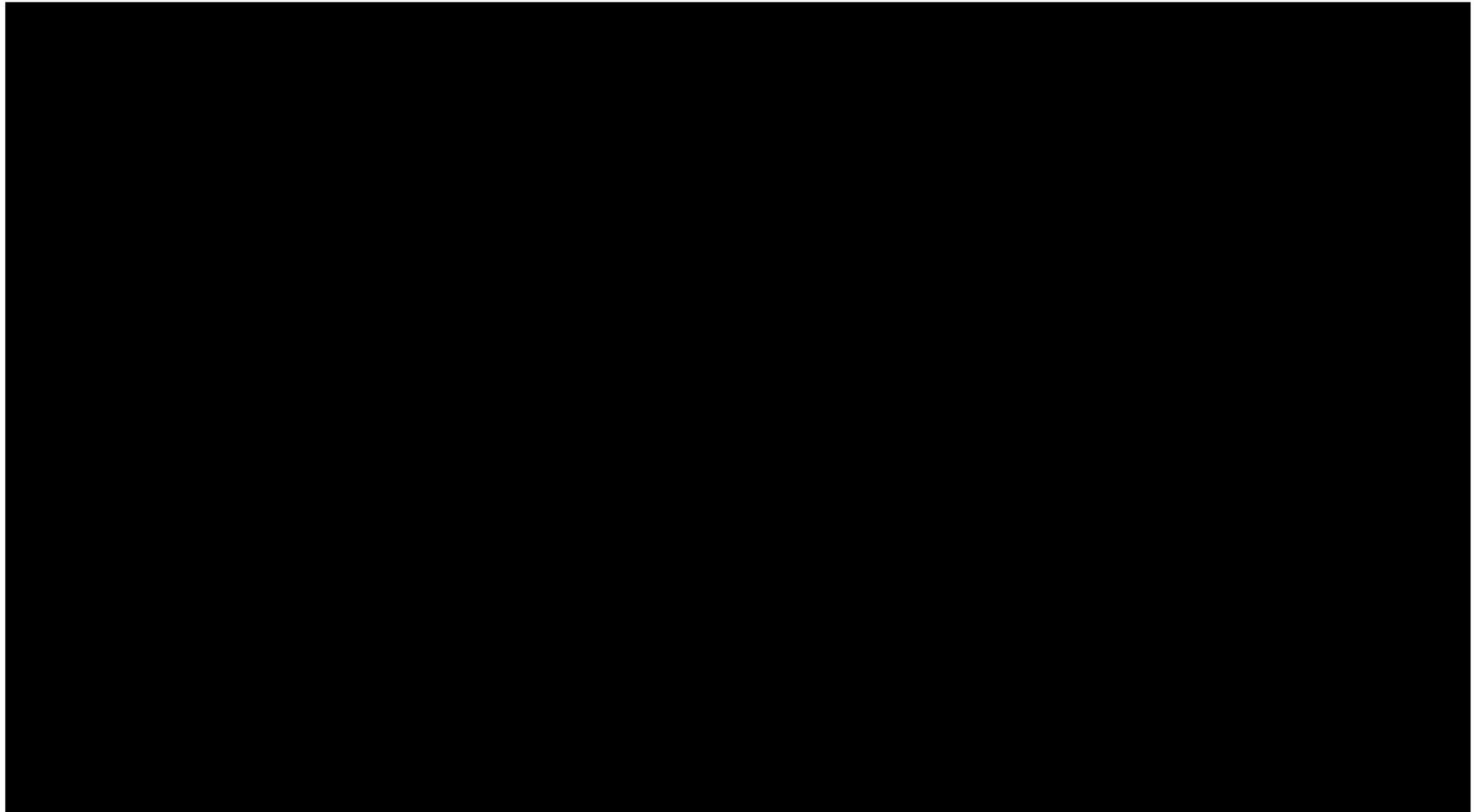
Map of ED/NASA Reach

U.S. Department of Education/NASA STEM Design Challenge Collaboration 21CCLC State Reach





Collaboration Overview



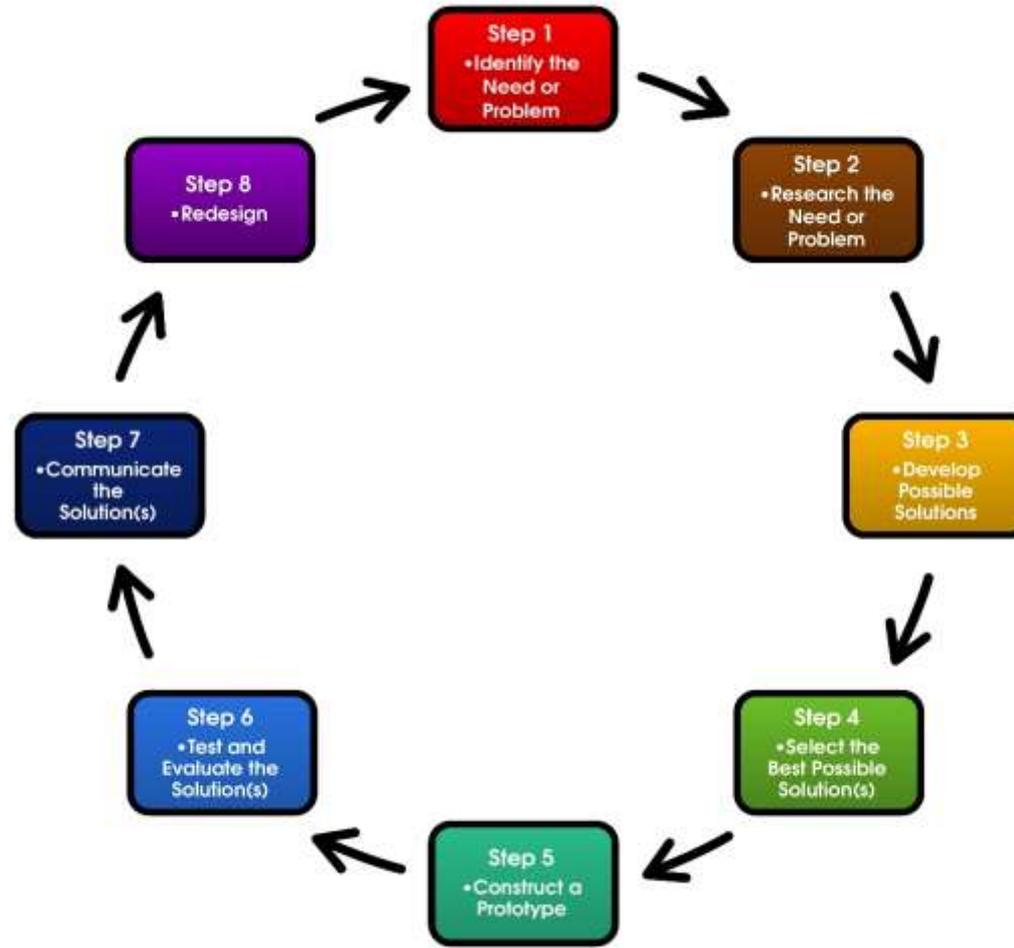


Engineering Design Challenges

- Students use the engineering design process to develop solutions to problems based upon NASA real world research. Through the process students connect with scientists and engineers to refine ideas. Final videos explaining solutions and associated data are submitted to NASA and ED for review.
- The engineering Design Challenge is offered to educators of middle grades who desire to present innovative and effective learning opportunities to students in need of engaging and authentic STEM experiences.



Engineering Design Process





NASA/ED Engineering Design Challenge Menu



Parachuting onto Mars

Develop a drag device to slow a spacecraft for entry, descent, and landing.



Crew Exploration Vehicle (CEV) Design

Help design NASA's next generation spacecraft!



Why Pressure Suits?

Develop a containment system to protect astronauts from the vacuum of space



Packing up for the Moon

Develop a plant growth system to help sustain astronauts on a lunar surface



The Global Learning and Observations to Benefit the Environment (GLOBE)

GLOBE is an international science and education program that provides worldwide opportunities for students and the public to participate in data collection, and the scientific process, and contribute to our understanding of the Earth's systems and global environment



GLOBE Investigations

Clouds & Energy Investigation

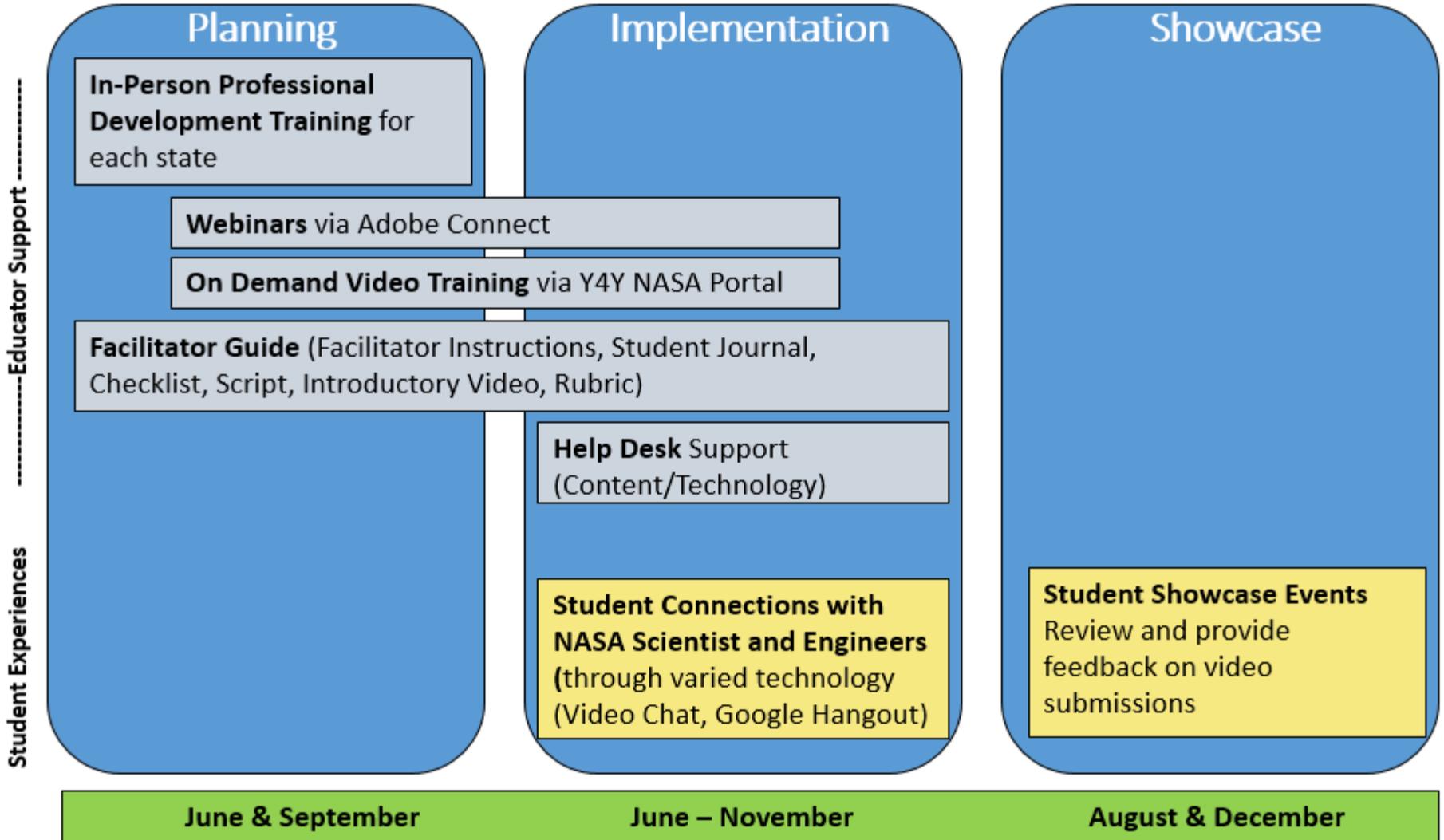
Students will conduct a science investigation to better understand how clouds impact Earth's energy system by collecting and analyzing GLOBE measurements of clouds, air temperature, and surface temperature.

Biosphere Investigation

Students will conduct a science investigation to better understand factors that influence their biome and growing season by collecting and analyzing GLOBE measurements of soil temperature, land cover, and plant phenology.



Training and Support Plan





Challenge Module Structure

Each challenge will include the following information:

- Lesson Plan
- Challenge Checklist for Instructors
- Introduction Video
- Suggested Script
 - (Power point and Text)
- Student Instruction Sheet
- Rubric
- Video Submission Instructions
- Extension Links

The screenshot shows a challenge module page with an orange and black background. The title is "CHALLENGE 1: PARACHUTING ONTO MARS". Below the title, there is a paragraph of text describing the challenge: "You will work in a team to design, build, and test a drag device. You may only use materials provided, and must correct for a team-built cargo bay that is assembled using the template provided. The overall mass cannot exceed 50 grams. The drag device must have at least five separate angled edges (rounded edges are allowed, but one big circle is not allowed). It should protect the weighted cargo bay when it is dropped from a height of at least 2 meters. Surviving higher drops is preferred." To the right of this text, there are three key details: "Objective: Student teams will design a device to slow the descent of a space craft or probe while protecting its cargo for a successful landing.", "Grade Level: 5-8", and "Time Required: Approximately 10 - 20 Hours". At the bottom, there are two main sections: "Plan Your Challenge" and "Deliver Your Challenge". Under "Plan Your Challenge", there are three items: "Challenge Checklist", "Materials for Challenge", and "Facilitator Guide". Under "Deliver Your Challenge", there are two items: "Presentation Slides" and "Video Criteria and Rubric".



Elements of Training Plan

- Maximize accessibility by providing training in multiple formats
- Web seminars and videos will support face-to-face model

	Face to Face	Live Web Seminars
Platform	Train the Trainer	Collaborative Software
Duration	1-Day	60 - 90 minutes
Time Frame	June/August	June/August
Audience	Trainers/Leads /Instructional Staff	Instructional Staff
Frequency	1 per state	Multiple sessions per week



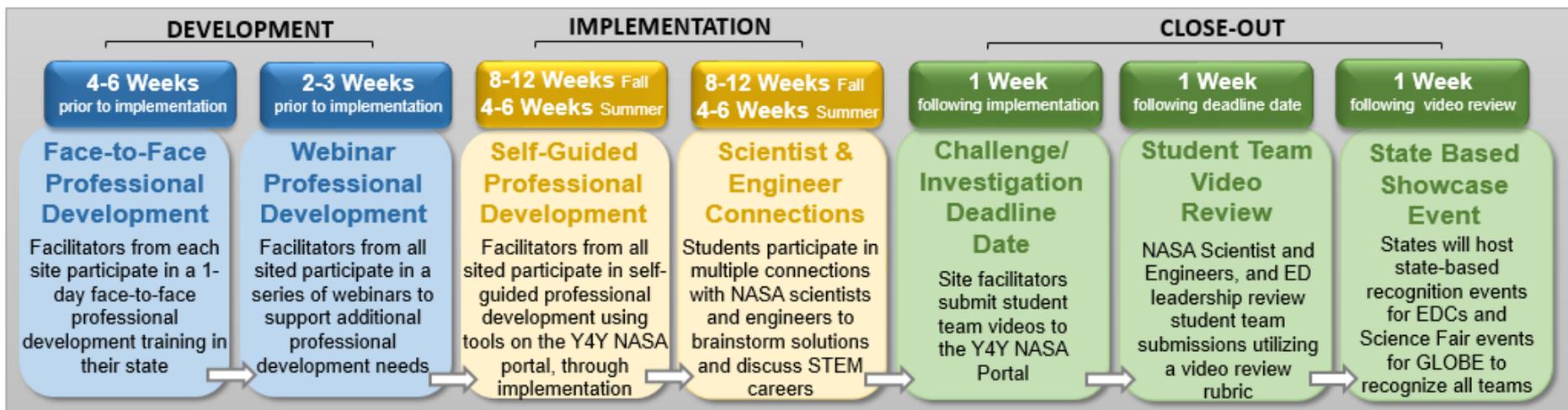
Challenge Supports

- NASA will offer opportunities for sites to connect with SME's during the pilot
 - Answer student questions, learn about careers, hear first hand about real world challenge context
 - Connect through collaborative technology
 - Sites will register through the Y4Y website to participate in scheduled SME Connections
- Help Desk support about content or technology
- Technology Survey/Support





Recommended Implementation Schedule



*Summer and Fall Opportunities available



Site Responsibilities

- Access to adequate technology resources
- Choose a minimum of one challenge or GLOBE investigation
- Participate in associated training and preparation
- Complete activity
- Participate in live student events
- Submit a minimum of two student entries
- Participate in the evaluation



Major Topics at In-Person Training

- Walk Through Design Challenges/GLOBE Investigations
- Engineering Design Process/Scientific Research Process
- Technology/Subject Matter Expert Supports
- Project Timeline Review
- Evaluation

