

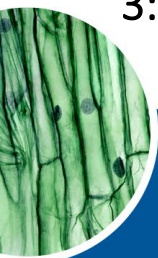


S-STEM Resource & Evaluation Center (REC)



Year-by-Year Evaluation Guidance of S-STEM Grants

June 11, 2026
3:00-4:00 p.m. ET



NSF AWARD #2224093: AAAS-NSF S-STEM
Resource & Evaluation Center

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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In the chat...

please introduce yourself!

- Provide your name, institution & S-STEM award track (if applicable)

what are you curious about?

- What questions do you have coming into our webinar today?



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AAAS S-STEM Resources & Evaluation Center (REC)

The S-STEM REC seeks to cultivate a network of S-STEM stakeholders and promote the exchange of ideas, resources, opportunities, and knowledge related to the effective strategies and practices to increase the number of talented low-income students obtaining degrees in STEM and entering the STEM workforce.

AAAS S-STEM REC works to:



Increase the effectiveness of the S-STEM Portfolio



Build the capacity of S-STEM Network Programs

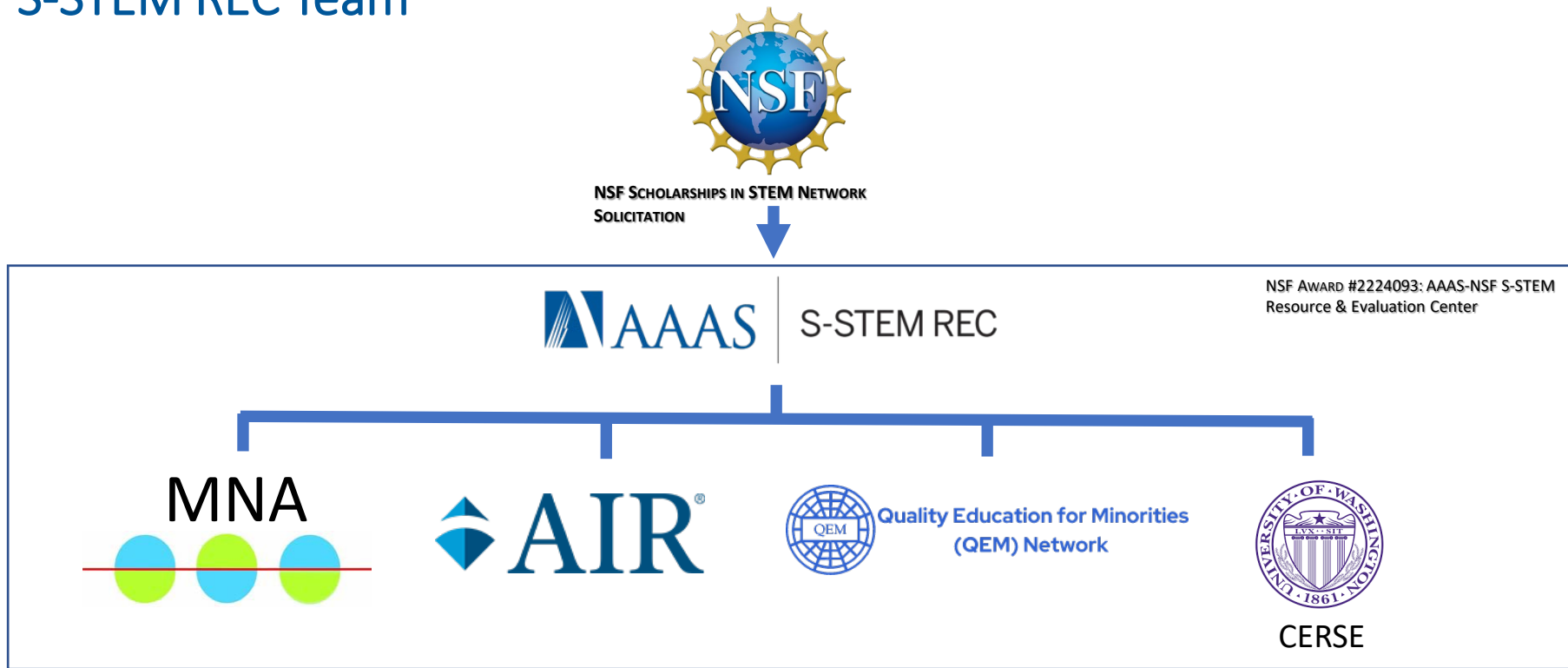


Build the capacity of S-STEM Scholars



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Learn more about applying for and managing an S-STEM program, effective practices to support talented low-income students, and content shared during S-STEM REC webinars.

Guidebook for NSF S-STEM Project Evaluations Across the Project Lifecycle

This guidebook is for individuals and teams responsible for designing, managing, researching, or evaluating an NSF S-STEM project across its full project lifec...

March 30, 2026

Guidebook

Workbook: Calculating Effect Size with Small Samples Using Hedges' g for NSF S-STEM Evaluations

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YEAR-BY-YEAR EVALUATION GUIDANCE FOR NSF S-STEM PROJECTS



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Who Is This Guidebook For?

Audience, purpose, and how to engage

Primary Audience

- Evaluators & external evaluation partners
- Principal Investigators and co-PIs
- Project managers and coordinators
- Social science researchers (Track 3)
- Institutional research partners

Also Useful For

- Department chairs seeking clarity on S-STEM accountability
- Financial aid and advising partners
- Institutional leaders planning for sustainability
- Teams preparing Track 1, 2, or 3 proposals

Key Principle: Effective S-STEM evaluation begins before the award is made. Engaging an evaluator during proposal development strengthens alignment, feasibility, and data systems from the outset.

S-STEM Project Tracks Overview

Evaluation expectations must align with track and phase

TRACK 1

Planning + Implementation

Includes Year 0 planning/self-study period before scholars are selected. Focuses on institutional readiness, recruitment strategy, and infrastructure development.

Begins: Year 0 → Year 1+

TRACK 2

Immediate Implementation

Begins scholar selection and recruitment in Year 1. Focuses on design and implementation of evidence-based supports to improve retention and success.

Begins: Year 1 →

TRACK 3

Implementation + Research

Begins implementation immediately AND includes a required social science research component aimed at generating generalizable knowledge.

Begins: Year 1 →

Evaluation Should Never Outpace Implementation — what is appropriate in Year 1 differs fundamentally from Year 4.

The S-STEM Evaluation Lifecycle at a Glance



The lifecycle is cumulative: early formative findings shape later summative assessments. Evaluation builds progressively as scholars advance through the program.

FEEDBACK LOOPS

Formative data becomes summative evidence | Summative findings generate new formative action | The loop never closes — it evolves

Formative vs. Summative Evaluation

Distinct purposes — but not separate phases

FORMATIVE EVALUATION	SUMMATIVE EVALUATION
Supports continuous improvement while implementation is underway	Examines outcomes once sufficient evidence has accumulated
<i>Are recruitment & selection working as intended?</i>	<i>Are scholars persisting at higher rates than baseline cohorts?</i>
<i>Are scholars participating in mentoring/cohort activities?</i>	<i>Are academic progression patterns improving? For whom?</i>
<i>Are scholarship disbursements timely and aligned with unmet need?</i>	<i>Are degree completion and STEM attainment outcomes strengthening?</i>
<i>Are early academic supports reaching those who need them most?</i>	<i>Are project strategies producing measurable impact across cohorts?</i>

In S-STEM projects, formative and summative evaluation frequently overlap. Multiple cohorts active simultaneously means an evaluator may present summative findings on Cohort 1 while providing formative feedback on Cohort 3's onboarding — in the same reporting cycle.

Evaluation vs. Generation of Knowledge

Conceptually distinct — yet complementary (especially in Track 3)

EVALUATION

- Focuses on project effectiveness within a specific institutional context
- Examines implementation fidelity, participation, and academic outcomes
- Produces actionable recommendations for the PI/co-PI team
- Assesses progress toward grant goals and NSF reporting requirements
- Contextual — not intended to generalize beyond the project



RESEARCH (Track 3)

- Seeks to generate generalizable knowledge beyond one institution
- Examines mechanisms and theoretical constructs (e.g., mentoring quality, STEM identity, financial stress, sense of belonging)
- Produces theory-driven publications and knowledge contributions for the broader S-STEM community
- Must remain analytically and purposefully distinct from evaluation even when sharing data sources

Example: Evaluation may document that scholars in structured mentoring show higher retention. Research then explores WHY — examining mediating variables such as sense of belonging or academic confidence.

Year 0 (Track 1 Only): Planning & Readiness

No scholars yet — evaluation focuses entirely on design integrity

WHAT THE PROJECT IS DOING

- Refining recruitment strategy and eligibility criteria
- Designing scholar identification and selection procedures
- Clarifying scholarship disbursement processes
- Developing mentoring and support structures
- Establishing leadership roles and cross-unit coordination

WHAT THE EVALUATION IS DOING

- Finalizing the evaluation plan and refining evaluation questions
- Aligning the logic model with measurable indicators
- Preparing and submitting IRB documentation
- Identifying baseline institutional STEM persistence and completion data
- Establishing data-sharing agreements with institutional research offices
- Developing data collection tools aligned with Evidence-Based Practices (EBPs)

Year 0 Deliverables: Readiness Memo (5–8 pp) | Finalized Evaluation Matrix | Baseline STEM Profile of Institution

Years 1–2: Primarily Formative

Laying the groundwork for all future summative analyses

Implementation Focus

- Recruiting & selecting scholars
- Awarding scholarships based on unmet need
- Launching cohort meetings & mentoring
- Establishing advising & academic support systems
- These years are characterized by refinement — processes clarify, roles stabilize

Evaluation Activities

- Review selection transparency & demographic reach
- Monitor scholarship disbursement timelines
- Track mentoring participation and dosage
- Collect scholar engagement & satisfaction data
- Examine early academic indicators (GPA, credit accumulation, term-to-term retention)
- Identify early risk signals

Reporting Deliverables

- Semester-based dashboards (GPA, retention, mentoring)
- Short formative memos with recommendations
- Annual evaluation reports
- Leadership presentations for PI/co-PI and advisory boards

Formative data from Years 1–2 are NOT temporary snapshots — they become the longitudinal building blocks for all Year 3+ summative analysis.

Year 3: Midpoint Summative

First point at which meaningful trend analysis becomes possible

PROJECT CONTEXT

- Multiple active cohorts at different stages
- Stabilizing implementation — core systems more consistent
- Refining mentoring & academic supports based on Year 1–2 feedback
- First year project can ask trajectory questions: 'Are our supports producing measurable academic progress?'
- For Track 3: mid-grant review makes summative evidence especially critical

MIDPOINT SUMMATIVE EVALUATION

Retention Rate Analysis

Semester & annual persistence across active cohorts

Academic Progression

GPA distributions, credit accumulation, course completion

Cross-Cohort Comparisons

Hedges' g for small samples where applicable

Subgroup Equity Analyses

Transfer vs. first-time, first-gen, underrepresented groups

Deliverable: Formal Midpoint Evaluation Report — feeds directly into NSF Annual Reporting and internal strategic planning.

Key Shift: From 'Are we implementing as intended?' → 'Are our supports producing measurable academic progress?'

Working With Small Samples: Effect Size & Subgroup Analysis

EFFECT SIZE WITH SMALL SAMPLES

- S-STEM cohorts are typically small — traditional significance testing may not capture meaningful differences
- Hedges' g adjusts for small-sample bias and estimates practical magnitude of change
- Example: If mentoring enhancements are introduced in Year 2, effect sizes quantify whether GPA or retention gains are practically meaningful
- Effect sizes complement — not replace — descriptive and contextual analysis
- See the companion guidebook on calculating effect size with small samples

SUBGROUP EQUITY ANALYSIS

- Examine outcomes across scholar characteristics: transfer vs. first-time, first-gen, women in STEM, underrepresented groups
- Overall, 88% retention may mask a 75% rate for transfer scholars vs. 92% for first-time-in-college
- Such findings signal where targeted advising, mentoring, or onboarding adjustments are needed
- With small cohorts: prioritize descriptive trends, practical significance, and contextual interpretation over statistical significance

Goal: Identify meaningful patterns that inform refinement and strengthen equitable scholar success.

Years 4–5: Intermediate Summative

From monitoring components to analyzing the ecosystem of supports



Institutional leaders start asking broader questions:

Which practices demonstrate consistent impact? Which supports require disproportionate effort relative to outcomes? What elements are ready for institutionalization?

Summative findings at this stage should directly inform formative refinements — the loop remains active.

Year 6: Final Summative

Culmination, synthesis, and institutionalization planning

Degree Completion & Time-to-Degree

- Overall graduation rates for S-STEM scholars
- Comparison to baseline institutional STEM completion data
- Average time-to-degree and on-time graduation rates
- Credit accumulation patterns

STEM Attainment & Post-Graduation

- Persistence within STEM majors / shifts across STEM pathways
- STEM employment, graduate school enrollment, research positions
- Survey or alumni follow-up for immediate post-completion trajectories

Cumulative Impact Assessment

- Multi-year synthesis: how scholarships + EBPs collectively contributed
- Combined influence of mentoring, research, financial support, advising
- Cross-cohort equity of outcomes

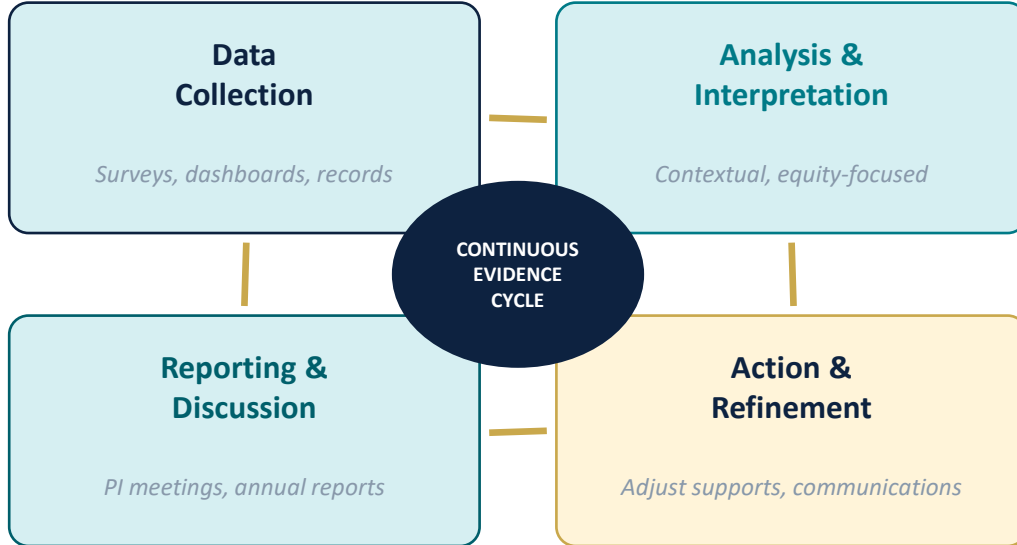
Lessons Learned & Sustainability

- Effective scholar selection and mentoring structures
- Communication practices that improved scholarship renewal clarity
- Strategic recommendations for maintaining high-impact practices post-grant
- Policy revisions and institutionalization pathways

Year 6 is not simply a closing year — it is a strategic planning period. Final summative evidence positions the project's legacy beyond the grant.

Feedback Loops in Practice

How evaluation findings become decisions — not documents



WHEN FEEDBACK LOOPS OCCUR

- After semester retention analyses
- Following survey administration cycles
- After midpoint & intermediate reports
- During regular PI/co-PI meetings
- In advisory board sessions

Evaluation becomes embedded in leadership practice — not appended to reporting requirements.

Project & Evaluation Activities at a Glance

All tracks — Year 0 through Year 6

YEAR	PROJECT ACTIVITIES	EVALUATION PHASE	KEY EVALUATION TASKS
0 (Tr 1)	Planning, self-study, design mentoring structures, needs assessment	Readiness	Finalize eval plan; IRB; logic model; baseline STEM data; data tools
1–2	Recruit/select scholars; award scholarships; launch mentoring, cohort meetings, academic supports	Formative	Monitor onboarding; track mentoring; review disbursements; collect scholar feedback; early academic indicators
3	Serve multiple cohorts; stabilize systems; dissemination	Midpoint Summative	Assess retention; analyze progression; subgroup analyses; comparison analysis; midpoint report
4–5	Support upper-division scholars; strengthen research, internships, career prep; plan for long-term outcomes	Intermediate Summative	Cross-cohort analyses; equity of outcomes; cumulative scholarship impact; sustainability briefs; dissemination
6	Scholar graduation; transition to workforce/graduate study; project closeout	Final Summative	Degree completion; post-grad pathways; synthesize findings; lessons learned; good practices documentation

Evaluation is cumulative: early activities are diagnostic and structural; later activities synthesize findings for sustainability and institutional change.

From Compliance to Strategic Asset

The central message of this guidebook



- 1 Evaluation must match the project's phase and track — what is appropriate in Year 1 differs from Years 4 or 5 and certainly 6.
- 2 Formative and summative evaluation are not sequential stages; they are interlocking components of a continuous evidence cycle.
- 3 Formative data collected early become the longitudinal building blocks for all future summative analysis.
- 4 Summative findings are not endpoints — they reopen the loop and generate new formative action.
- 5 Evaluation embedded from the proposal phase becomes a strategic tool for reflection, refinement, and institutional learning.

What Questions Do You Have?



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