

Tips for Developing NSF Proposals



This tool is designed for early career STEM education researchers to offer tips for writing grant proposals. The advice largely comes from National Science Foundation-funded awardees who have graciously shared information about their own proposal writing experiences. Their perspectives are a good complement to the official [NSF guidelines](#).

Developing Your Research Agenda



See your dissertation work as a foundation for developing your research agenda. In the process of addressing one question through your dissertation, you have likely raised several more. You are not starting with a blank slate.

Develop a system for documenting and tracking questions or curiosities that arise. Note why they are interesting to you and how they connect with the work you have done previously. You do not have to answer all of your questions right now, but keep the curiosities alive so you are ready to take advantage of opportunities to engage with those questions in the future.

Identify a big, overarching question that you are always working toward. From there, you can begin identifying cascading questions. Each time you have a major insight, you will be in a better position to develop the next series of questions you want to explore. It is okay if you are not able to formulate those questions concretely right now; it is hard to know early in your career exactly how these ideas will evolve. Stick with questions that motivate you, and make sure they are getting you closer to answering your overarching research question.

Determine how you are going to build on what you have studied previously to move your research agenda forward. Will you use different methods or a new framework? Are you applying a framework to different aspects of a phenomenon? Are you examining a topic that has not really been explored in your field? If during your doctoral program you were part of a research team that didn't align with your long-term professional goals, think specifically about the work that you initiated as part of this larger project and how that helped shape your research trajectory. Ask advisors, mentors, and others who are familiar with your work to help you develop your argument.



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Think about how you can translate your research agenda into projects that you lead and other collaborations. You want to conduct research through projects that you are leading to build the trajectory you want for yourself. At the same time, working on collaborative projects can contribute to your own research while also demonstrating how your work connects to what others are doing, and giving you direct access to the knowledge, skills, experience, and connections of colleagues.

Engage in identity work to start constructing a narrative about who you are as a scholar. While your research agenda will likely evolve throughout your career, take the time now to think about the connection between your current research agenda and how you identify as a scholar. What do you want to say? What conversations are you trying to join? Who do you want to be within the larger community?

Be intentional about the core ideas you are going to pursue as an early career scholar. If you are in academia, think ahead to promotion and tenure. Prioritize the questions you really want to answer first. This will help you be more focused in the types of collaborations you want to pursue and hopefully avoid feeling scattered or spread too thin as you learn to balance research with your other professional responsibilities.

Developing Your Proposal Idea

See the proposal as a vehicle for accomplishing your research goal(s). Ask yourself:

- How will the proposed project make a contribution to the field?
- How does this proposal complement or build on my existing work?
- Will the proposed project help move me closer to my professional goals?

Project ideas can arise at any time and in many different ways. A proposal idea often emanates from prior research or a very specific area of interest.

However, sometimes chance plays a role: a peer poses an informal question during dinner at a conference, or a newspaper article sets in motion the exploration of a new idea. Being in conversation with practitioners and fellow researchers interested in similar work can be generative and keep you grounded in the field. Not every idea will automatically translate into a proposal, but over time, small pieces come together in ways that can inform the direction of your work.

When developing your research ideas and questions, consider the following:

- What issues am I observing in my own practice and/or research?
- What questions is the field addressing at the moment?
- In what ways does my project idea align with the big questions within the discipline?
- What are some of the unanswered questions from my previous work?
- Do my research questions respond to the request for proposals (RFP)?
- What contribution can I make to the field and a funder's portfolio of projects?

PRELIMINARY RESEARCH

Conceptualize your project, and develop an abstract or a preliminary statement. You can revise this as your proposal idea evolves. Approach your project idea by thinking about how you will do the work, and present your findings in a way that will most benefit the field.

Conduct research to determine whether similar work already exists. Use this as an opportunity to catch up on all of the literature on the topic. Determine the quality of identified research as well as gaps or limitations in content, methodology, etc. If you are considering a DRK-12 submission, read about funded projects and PIs on the CADRE website: cadrek12.org.

Get feedback from your peers to assess the need for the proposed work. Consulting with others you trust can help you decide whether your proposal idea may be worth pursuing and, if so, how to think about the depth and breadth of the proposed research. Peers may be

STEM education researchers within your institution or those from the larger STEM education network.

Talk to other successful grant recipients at your institution. Ask about their process for developing proposals. Determine if they would be willing to discuss their funded proposals. Find colleagues you respect and with whom you share interests. You could arrange monthly meetings with colleagues as a way to discuss ideas. In some cases, these relationships might flourish and evolve into future collaborations.

Share your ideas more broadly with people in and outside of your field. When you have a clear description of your proposal, ask others to comment. These interactions can help to clarify your logic model, research questions, and methodological approaches. If you find someone whose work interests you, ask to see their funded (or unfunded) proposal(s). Many researchers are willing to share them; consider asking to see only their project descriptions because sharing a proposal budget can cause problems in terms of releasing confidential information. Even if the researcher says no, you have made a connection.

Consult with funder program directors. Once you are in a place where you can clearly articulate your idea, share a one-page concept paper with a program director via email. For NSF, check the website to find the program directors responsible for the program to which you are planning to submit. Try to zero in on one program director by identifying the contact for the discipline or focal area that relates to your concept paper. Read the solicitation and proposal preparation guides carefully before you contact them; some of your questions might already be addressed. Be prepared with questions for the program director that demonstrate you have done your research. Bouncing your ideas off of a program director can be extremely helpful. Most directors will generously give some of their time to discuss your proposal ideas and to help you determine whether your concept is appropriate for a specific NSF program and aligns with the priorities of the solicitation. If your project idea is not a good fit, the program director may recommend a different program. NSF program directors are typically interested in coaching early career professionals. However, because NSF program directors make final

funding decisions based on input from reviewers, they are limited in how much guidance they can offer related to proposal development. The level of support program directors can offer varies among funding agencies depending on their roles and responsibilities.

Funding Your Research

FIRST STEPS IN SECURING FUNDING

It can be challenging for young professionals to become funded researchers. Many funders, including NSF, want to support the next generation, but they also want to see a record of success. It is hard to compete with 20-year veterans, but there are options that can help you gain traction.

Research postdoctoral opportunities, such as the Spencer Postdoctoral Fellowship Program. This will give you experience writing a proposal and managing your own short-term research project. It will also help you begin to think about your research agenda in terms of concrete project ideas. During this time, you will have an opportunity to further flesh out your research trajectory before you begin applying for faculty positions.

When you are applying for research positions, get to know what your institution expects of junior faculty or researchers. Research 1 institutions and nonprofits will likely expect pre-tenure faculty to secure grant funding. An R2 institution or liberal arts university may prioritize publishing. Clarify these expectations during the interview process; this will help you develop a timeline for your first few years. Institutions have different research supports, so it is important to learn what types of support your institution offers junior faculty. If an institution has expectations for grant writing pre-tenure but little to no support for junior faculty, this could be a red flag. Proposal writing takes time away from publishing, which can put pressure on the tenure clock for those with academic positions. Consider keeping proposals and projects in various stages to strike a balance between proposal writing, project management, and publishing.

Your first proposal should be relatively modest—something small-scale but interesting to you and in line with your research agenda and career trajectory. Focus on doing good work and getting good results.

A small grant will help you get your feet wet, establish a track record, and gain experience in different areas of project management on a small scale. Be realistic about project management. There is a steep learning curve around managing people, budgets, and reports. This is distinct from having a really good project idea, and both are critical for a successful proposal and project.

Explore opportunities for university, state, or foundation funding to gain experience managing grants and developing your portfolio before attempting to compete for NSF funding.

Consider submitting a proposal to NSF's Faculty Early Career Development (CAREER) Program. This program is designed specifically for junior faculty in a tenure track position, and is intended to provide a foundation for continued leadership in education research and development. The [CAREER Program](#) allows you to integrate a research program with your teaching and educational goals. While CAREER grants are extremely competitive, you are competing against other early career researchers like yourself and not veteran researchers with extensive backgrounds.

Although CAREER grants are great for some people, they are not ideal for all. CAREER grants are designed for solo researchers. If collaboration is an important part of your work at this stage of your career, another funding source would be a better fit.

FUNDING LARGER AND MORE COMPLEX PROJECTS

Once you are ready to lead a larger project, invite a more senior researcher to serve as co-PI on your first project, someone who has an intellectual stake in the project but also a desire to support you as a first-time PI. This can lend your project credibility. Your project advisors can also add credibility to your proposal. Collaboration will allow you and your team members to address a more complex problem from a variety of perspectives. However, in a collaborative environment, you will have to work much harder to carve out your

identity and establish yourself as an individual. This is an especially important consideration for academics in tenure track positions.

Identify funding sources. Some people look at funding sources first; others wait until they have a strong proposal idea and then identify sources that align with their proposed topic. Either approach should begin early in your process due to the unique guidelines and timelines for individual funding programs, even within the same agency. For example, NSF has a number of different portfolios within the education directorate. There are also education initiatives supported in the science directorates. Whichever approach you choose, make sure that the project you are proposing stems from a place of genuine curiosity and aligns with your research agenda. Do not allow the requirements of a solicitation to design the project for you; this can appear forced and lead you away from your overarching research question.

Explore how aspects of your research fit under different funding solicitations. Look closely at lists of awarded projects to understand what type of work different funders are supporting and note the strengths of those projects. It is likely that no single funding source or program will fund your entire research agenda over time, but you can focus on obtaining funding to address different parts of it while always keeping your long-term research goals in mind. Every project can provide an opportunity to investigate a different aspect of your research goals in a way that moves your research agenda forward.

One of the best ways to learn about what it takes to get funded through a specific program is to serve as a proposal reviewer. Volunteer to be a reviewer for NSF. Serving on a review panel is a great way to gain exposure to different styles of proposal writing and approaches to required content, as well as insight into how reviewers respond to those proposals.

Keep informed about funding opportunities. Take time to identify funding sources that align with your work, and set aside time to review their solicitations when they are issued. Build this into your schedule, and make it part of your professional routine. Sign up for funder elists (e.g., NSF and IES); they send out solicitations and Dear Colleague letters. Sign up to receive emails from your

institution's research office. Research the people who are receiving grants, and ask them about their process for identifying opportunities. You probably won't respond to the majority of the calls, but knowing what's out there can spark creativity and help you think more expansively about your research.

Do not apply for grants just for the sake of applying for grants. Identify a problem and develop an idea for solving the problem. See grant funding as a resource that gives you the capacity to work on the problem you want to solve.

Early Stages of NSF Proposal Development

Timelines for proposal development will vary depending on what is being proposed. A continuation of previous work requires a different amount and type of effort than proposing a brand new project idea. For most early career researchers, you will be proposing a new idea, so it is important to give yourself extra time. It is recommended that you start the process 1 to 1.5 years in advance.

Understand the funding process and timeline for your institution. Most academic institutions require that proposals be reviewed by the grants office to ensure that you are not making promises that have implications for the institution without their permission. Non-academic institutions will likely also want to clarify the institutional obligations required for your project. The process for this varies greatly by institution, so make sure you understand the requirements before pursuing external funding. Sometimes there is a cap on how many proposals can be submitted by the same institution. Check with your institution about this to know whether your proposal will be eligible for submission. Learn what paperwork is required and when internal processing deadlines occur. Talk to your grants office early and often!

Consider how you will move from your research questions to project design:

- What claims do I want to make?

- What evidence will I need in order to make those claims?
- What methods will allow me to gather that evidence?
- What kind of project design is possible? What is useful? What is manageable?
- What is the logic model?
- Who needs to be part of the team to successfully research these questions?

COLLABORATION AND PARTNERSHIP-BUILDING

Remember that we as individuals do not know and cannot do everything. What unique characteristics or experiences do you have that position you to be able to do this work well? What can you bring to the project that others might not be able to bring? Conversely, to do the work well, what additional knowledge, skills, experiences, and connections do you need to bring to the project through collaborators?

A strong proposal and project usually require more expertise than any one individual (or even one institution) has. Collaboration can make your proposal more competitive and allow you to better execute the project. Consider how a team of researchers, developers, partners, collaborators, advisors, and/or evaluators will bring the expertise needed to properly address the research questions. Look for people with whom you have good relationships, share value systems, and enjoy working; you will be working together for a while. Once you have compiled a team, work together to identify your relative strengths and discuss and document who will lead various aspects of the work, authorship, and how funding will be allocated.

Successful proposals can be built on existing relationships or through fostering new relationships. If you are seeking new collaborators, use your networks to find individuals who share your interests. Conferences are a great place to start identifying common interests, values, and approaches to research and practice. Explore the places where your work and others' intersects, and propose opportunities for collaboration. You can decide beforehand what you want to research and invite others to join, or you can decide on the focus of the research as a group.

Consider working with community partners to design the project. You can engage in co-development work in order to develop the proposal or propose co-development as part of the funded project. Co-development can build trust and help local practitioners become co-creators and invested in the knowledge generated through the project. Working with community partners can also help to keep funding in that community.

Establishing relationships and engendering trust with community partners can be a complex process, particularly if you and your team are not part of that community. In this case, it can help to have an intermediary or a cultural liaison—a professional contact who is connected to the community and who can vouch for you. Do not attempt to establish a formal partnership until you have visited the site multiple times and have established rapport with your potential collaborators. If you are planning to work with underrepresented communities, know that these communities might not have good prior experiences with researchers. Be understanding of and sensitive to their concerns or hesitations.

Start establishing partnerships early—at a minimum, six months to a year before the solicitation is due. It takes that long to build your team and relationships with schools, teachers, and other institutions, and to get to know the issues and needs that they identify as important. Take time to get to know your collaborators. Planning your project in advance, with well-established partnerships, can lead to a stronger proposal as well as to a better conceptual and methodological starting point if your work is funded.

Funders generally require external review of projects during their award period. If an independent evaluator will fill that role for your project, you can use your network to find the most suitable evaluator—someone whose opinion you respect and who can be a critical friend. Experienced PIs or NSF program directors might be able to make recommendations for evaluators. Design a role description for the evaluator to serve as a starting point from which you can develop a full plan.

Evaluators often prefer coming on board during the project design stage and before the proposal is finalized. An experienced evaluator can bring years of experience working with STEM education projects and help you think through your logic model, research design,

and aspects of project implementation and dissemination.

Do not be afraid to reach out to new people to serve on your advisory board, if you plan to include one in your project design. Invite people whose work interests you and who you think would add a unique perspective, even if you do not know them personally. The task of assembling an advisory board can help you form new relationships. Be clear about expectations for the advisor role as well as the logistics: number of meetings (virtual or in-person), stipends, and required travel. You can certainly revise the role and specifics, but have an initial plan when you approach potential advisors. Some prospective advisors may ask to see a proposal abstract; others may ask who else will be serving as advisors. It is important to share why you are asking them in particular to serve.

NSF Proposal Writing

MANAGE THE WRITING PROCESS

The writing process will vary depending on your style. Some write the summary first and then build out the rest of the proposal; others do the opposite. Everyone starts at a different place depending on how they organize their thoughts. Most people go through a long process of writing and rewriting.

Authorship of the proposal varies. In some cases, the PI writes the proposal, often on the basis of conversations with potential team members, advisors, and evaluators. Other times, a team not only informs the conceptualization of the project, but also helps to write the proposal. The process can occur in person or virtually. In some cases, a lead writer (usually the PI) drafts an outline and then assigns sections to different members based on their areas of expertise. This approach helps create buy-in from the team and may strengthen the overall proposal.

Once the sections are complete, one team member should act as the final authority to ensure unified style and voice. Make sure the narrative flows and that everyone understands what teammates are proposing even if they are unfamiliar with the areas of expertise. The proposed PI has final authority for the quality of the proposal.

Ask a colleague (or two) to read your draft. Are there missing pieces? Is it coherent? Does it make sense to an outsider? It is better to receive feedback from critical friends when the stakes are low than from blind reviewers when the stakes are high. Consider soliciting targeted feedback at different stages of proposal development. It is best NOT to wait until your final draft. By then, it is usually too late to make substantive changes.

FOCUS ON THE PROPOSAL CONTENT

Writing a proposal is very different from writing for publication. With proposal writing, you are trying to offer a specific rationale for your project and very detailed information about your goals, objectives, research design, and activities, as well as the implementation, dissemination, and evaluation process. Clarity and detail are crucial, and you must ensure coherence between the sections of the proposal. Ultimately, you are selling your work to the reviewers.

Demonstrate how your approach is novel, trusting, and transformative. You must convince the reviewers that there is a need, the need relates to a problem of national importance, you have an approach to addressing this problem, and your team is in the best position to carry out the implementation and study of the approach.

Use the first two pages to convince the reviewers to fund you; use the remaining pages for elaboration. The introduction to your proposal is critical. You have to hook the reviewer and make them excited to learn more. Introduce everything clearly in the first two to three pages: the problem, your proposed solution, your research questions, and how are you going to go about answering those questions. Use the remaining pages to elaborate on each point. Do not introduce anything new beyond the introduction. You might benefit from writing the introductory pages first in order to think through your project timeline. As you work on additional sections, you can keep returning to the first two pages to tighten your argument. This strategy requires a lot of time upfront but can be beneficial in the long run.

Dedicate time and attention to framing your project in a way that reflects the current work happening in the field. Keep it concise while making a compelling argument. Include a thorough review of the most up-

to-date literature. Serving on an editorial board or as a peer reviewer for a journal is a great way to stay updated on the current literature.

When developing a particular section, write for the highest expert in that field in terms of substance, but use language and examples that can be understood by everyone. You are writing for a diverse panel of experts. It is rare for all reviewers on a panel to have expertise in your specific area or even in your field; therefore, you must make your writing as accessible and understandable as possible. Read the solicitation to become familiar with the specific language it includes, and match it to your work. Provide concrete examples for those who might be unfamiliar with the concepts. Consider opening with a scenario or vignette to help engage people outside of your field. Do not simplify your proposal; just make it clear and accessible. Ensure deep intellectual integrity, but write it in a way that everyone can understand. Leave reviewers with the impression that it is important work, even if they do not understand all of the intricacies.

At the same time, remember that experts will review the sections of your proposal that deal with their particular field. For instance, a methodologist may read your methodology section; a teacher educator may review your plan for professional development. If an expert discovers a weakness in a section that addresses their area of expertise, they may convince the panel not to invest in you.

Tell a story. You must include all sections required by the RFP, but arrange them in a way that helps your narrative flow. Determine what story you want to tell, and then, as you are writing, check in periodically to make sure your storytelling is consistent. Be sure that for everything you propose, you follow the thread all the way through the proposal; do not leave anything unresolved. It is your story that will stand out for reviewers. Make it compelling!

Develop a logic model to describe what you are proposing and how the pieces of the project fit together. Use the logic model to show reviewers how you envision the progression of your grant and how different people will be involved. There are many ways to illustrate the model. PIs have recommended looking at the format of models

that others have used. The logic model should help with the coherence of the proposal.

A common thread in successful proposals is a solid theory of action—a clear, simple schema that provides the following:

- What is the context?
- What is the intervention?
- What mechanism will manifest from the intervention?
- How are you going to measure the specific changes that are a product of that mechanism?

Having that picture in the reviewers' minds will make it easier for them to assess details about methodology and other aspects of the proposal.

Be specific in describing how you will move from initial implementation to the final stage of the project, even if things do not go as planned. Demonstrate how you will operationalize what you are proposing, that you have a plan to pull it off with the money you are requesting, how you will measure what you are proposing, and why your project team is qualified to do this work.

Rationale and execution are important, but reviewers also understand that projects evolve. Things can change with timeline, budget, partners, etc. Be clear about how you plan to measure success, and interpret and deal with setbacks. Reviewers will want to know that you are thinking about mitigation or mediation of risk. Write the proposal as if everything will go according to plan, but demonstrate that you are adaptable and dependable should obstacles arise. Explain the guiding principles you will use to deal with unexpected deviations from the plan. For example, partners might drop out. How will you go about choosing new partners? How would you deal with attrition of teachers from your sample? Describe any preliminary work that you and your partners have done to address potential risks. Know that any weaknesses in your proposal will be identified. Show the reviewers that you have a backup plan that will allow you to maintain the integrity of the project.

Be considerate to your readers. Reviewers are reading many proposals. When writing, imagine that yours is the last proposal they are going to read at the end of a long day, and think about ways you can make their job easier. Consider using visuals to break up the narrative and present the information in a new way. This will give

the reviewer a bit of a break but also appeal to different types of learners. When used properly, figures and tables can help reinforce the big ideas. Formatting can also help draw attention to specific areas you want to highlight. For instance, consider matching research questions to their respective data sources and expected outcomes for ease of reading.

Interrogate your proposal. Develop a habit of asking questions such as:

- Can I envision what the data collection process will look like?
- Can I imagine how data analysis will be conducted?
- Can I imagine this project being productive if it does not go according to plan?

RESEARCH DESIGN AND DATA MANAGEMENT PLAN

Use preliminary data to build a case for why your work is important. Pilot studies are a great way to gather preliminary data, as is analyzing your dissertation data in a different way or replicating your intervention at a different site. Not including preliminary data can be a red flag for reviewers. Use these data to show evidence of promise for your project idea.

Common issues with research design and data management include questions of feasibility and whether the data will yield new insights that justify the investment. Be realistic about what it takes to collect these data as you have proposed. If what you are proposing seems risky, building in a pilot phase could strengthen your case.

There is not one type of methodology that is favored; good research design is what matters. Sometimes proposals come up short when using mixed methods since people tend to be trained in one or the other. Do not underestimate what it takes to do qualitative or quantitative work, and ensure that you have team members or advisors who can provide guidance.

Describe your data management plan in detail. Think about all of the data you will collect: video, audio, documents. Where are they going to be stored? How secure is the location? How will you de-identify the data? How long will you store your data? What data will you share? What is your process for destroying the data?

ADDRESS INTELLECTUAL MERIT AND BROADER IMPACTS

The intellectual merit criterion encompasses the potential to advance knowledge, and the broader impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

A project's intellectual merit and broader impacts can make or break proposal competitiveness. Position your work within the national conversation around broader impacts. At a minimum, follow the specific NSF guidelines for intellectual merit and broader impacts.

Convince the review panel that your work is a worthwhile investment. What contributions do you hope to make both conceptually and empirically? Do not just describe what you are going to do; describe how it will make a difference. Put yourself at the end of the project and ask:

- What was accomplished?
- How did it contribute to the field?
- Who is impacted by this work?
- Why should society care?

Think about broader impacts as extending beyond numbers. It is not just about reaching X number of people or certain populations; it is also about the substance of the work and how it will transform some persistent inequality or problem in the field. Your broader impacts could relate to theoretical and/or methodological advancement, types of products, new educational models, or ways of establishing partnerships. Broader impacts are not only about people served by the project but also the knowledge generated.

When describing broader impacts, proposers often overclaim relative to what their project can actually do. You, as an individual researcher, may not solve this problem, but you can make a valuable contribution to the collective knowledge base that seeks to address the problem. Every study has limitations. Be honest about those limitations.

DEVELOP A BUDGET

The budget provides a lot of information about your project design. Your narrative explains the problem and how you plan to solve it, whereas your budget provides

additional detail and demonstrates the costs for each component of the project. Make sure your budget reflects all the activities described in your proposal. If your proposed budget is too low, for example, the reviewers will know that certain activities cannot be done or done well. Likewise, red flags will be raised if you are requesting too much money for a limited number of activities.

One of the biggest problems, especially with early career professionals, is promising too much with too few resources. Knowing exactly how much it costs to do certain activities becomes easier with experience, but be sure your budget aligns with what you want to do. For example, do not propose collecting more data than you can afford to analyze.

Make sure you understand the budget requirements for NSF and for your institution. See the [budget guidelines](#) in the Proposal & Award Policies & Procedures Guide (PAPPG). Some questions to consider include:

- Am I providing adequate stipends for participants? for advisors? Check the allowable and standard rates.
- Have I budgeted enough for travel to do the work, attend PI meetings, present my findings, etc.? Check the government per diem rates.
- Have I budgeted for the type of evaluation I want?
- If this is a multiple-year project, have I accounted for raises?
- Have I budgeted appropriately for the preliminary work required to get the project off the ground?
- Do I have enough money allocated for data analysis, writing, and dissemination at the end of the project?
- Is there a budget for advisors?
- Will there be subcontractors and/or consultants for this project?
- Have I budgeted for graduate students or postdoctoral researchers?
- Have I allowed adequate time to do my work as the PI, including course buy-out, if necessary?

Work with others to develop the budget. Some proposal leads will identify the parameters, but allow those with more experience to generate the numbers. There might be institutional support to help you with this. Still, make

sure you are engaged in the process because budget management will be your responsibility.

Even if the overall budget is adequate, there is often a need to shift individual line items over the course of the project. Maybe you won't need as much money for travel. Maybe you will need to bring in more graduate students. Any significant changes will need approval from NSF. Knowing what constitutes a significant change will get easier with time, but when in doubt, consult the program guidelines and requirements outlined in the [PAPPG](#) or talk to your program director.

KEY PROPOSAL ATTACHMENTS

Proposal attachments provide valuable information for the reviewer that is vital for the assessment of your project's feasibility and viability. Read through the guidelines carefully to ensure that you have all the information and forms necessary. Ensure that your proposal is not rejected for a simple oversight.

Prior to submitting your proposal, check to see if you should obtain letters of collaboration. If you are working with specific school districts or states, you should have letters detailing their roles on the project. In addition, it is advisable to obtain letters from your advisory board. Having letters from the people and institutions with whom you will collaborate demonstrates their commitment to the work. Please make sure you do NOT submit testimonials about your organization or letters from legislators or policymakers.

If you are working with postdoctoral researchers, do not forget to include a mentoring plan. Take time to consider how their participation in the project will enhance their education and future as a researcher. Ask your colleagues what type of mentoring they have offered. Sample mentoring plans are available at cadrek12.org.

Between Submission and Notification

Do not contact NSF while the proposal is under review. It is advisable to consult with program directors when you are developing your idea, but be hands-off once you have submitted.

If the program director gets back to you with questions or feedback from the review panel, answer every question as thoroughly as possible and within the requested timeline and page limit. Be clear and specific so it is easy for the program director to advocate on your behalf during the final review.

See the questions as an opportunity. You have had a break and have been able to reflect on the proposal you submitted. There might be new things you want to highlight in your responses to the reviewers' questions. If it seems like a reviewer may have misinterpreted your work, pay particular attention to their comments. It may mean you have not communicated your idea clearly, and this could be an opportunity to clarify.

If you submitted a collaborative proposal, meet as a team to discuss how you will respond to the reviewers' comments/questions. It is important to remain a cohesive group throughout the negotiation process.

The Successful NSF Proposal: Getting Your Project Started

Do not shortchange yourself on the time it will take to get the project started. Getting a project off the ground is hard work. Use the proposed timeline to create and implement a work plan. During this phase, you may need to hire staff and students, firm up your partnerships with school districts, prepare subcontracts and consultant contracts, set up your management systems, or address Institutional Review Board (IRB) issues.

Introduce yourself (virtually or in person) to the program director assigned to your award. Keep them informed as you begin to navigate this work and throughout the process, especially when you encounter issues that require difficult decisions. At the same time, be judicious when asking for their time; program directors are busy!

Note when NSF will require your annual report. The annual report is an opportunity to share what you have

learned and accomplished over the year. Keep notes during the year that can provide input for that report.

Dealing with Rejection: Try Again!

We all get proposals rejected at some point in our careers. Failure is part of the experience. Do not feel bad if your very first proposal is rejected. Many PIs report having submitted a proposal several times before getting funded. The hurt from rejection gets easier to manage over time, and each rejection brings a new learning experience.

You can build on rejected proposals by finding ways to incorporate your ideas into future proposals. Your original ideas can inform later work in many ways, even if you cannot recognize those opportunities immediately. One PI was told she'd submitted a great proposal but the field was moving in a different direction. She held onto the rejected proposal for 10 years and was able to recycle some of those ideas once funding trends shifted. You do not necessarily have to wait 10 years, however!

You can revise the proposal and resubmit. If your proposal is rejected, schedule a meeting with the program director who was assigned your proposal for additional feedback on the reviews and how the proposal can be improved. Ask yourself what you can learn from this. Many people do not take advantage of this opportunity.

Remember that your proposal is being reviewed by only one panel. If it had been reviewed by a different group of people, feedback might have been completely different. This is why it is important to discuss feedback with the program director who was in the room.

Make sure the program you submitted to is the best fit. If you are considering submitting the proposal to another program, make sure that you can revise your project and proposal so that it is responsive to the other program's solicitation. You might also be able to reconceptualize a project, such as resubmitting a design and development proposal as an exploratory research proposal.

Additional Resources

- [10 Tips for Successful Grant Writing](#)
- [Grant Proposals \(or Give Me the Money!\)](#)
- [Grant Proposal Writing Links and Resources](#)
- [NSF Programs: Directorate for Education & Human Resources \(EHR\)](#)
- [Old Advice for New Researchers](#)
- [On the Art of Writing Proposals](#)
- [Sample Awarded Proposal Template](#)
- [Ten Tips for Developing a Programmatic Line of Research](#)
- [Where to Search for Funding](#)
- [Writing the Broader Impacts Section of Your Research Proposal](#)

[Additional resources](#) available at cadrek12.org.