

~ Proposed Plan of Research ~

Note: Your other GRFP essays should convince reviewers of your readiness to conduct research (e.g., knowledge, dedication, and specific skills). The purpose of this essay is to convince reviewers that your proposed research plan (or research interest) is well reasoned, has intellectual merit and holds potential for broader impacts. The **new GRFP announcement** explains the scoring criteria. Here are a few examples of what reviewers will want to learn from your proposed research plan:

- What is the specific, researchable research question or hypothesis?
- Has the student adequately documented the background and justification for this study? Does the plan address a significant problem or need? What is the scope of the problem (e.g., local, national, global)?
- If the proposed plan follows an established line of research, does the literature (or previous studies) point to unsolved problems, knowledge gaps, contradictions in findings, or need for further study/testing?
- If the proposed plan is an extension of a larger research team effort, has the student clearly explained his or her specific responsibilities and how this proposed plan work fits into the overall project?
- If the proposed plan is a creative concept, does it address NSF priorities, emerging trends, or global or interdisciplinary STEM issues? Is the proposed plan potentially transformative?
- Are the proposed methods rigorous? Appropriate for the research question or hypothesis? The process or steps clear? What are potential pitfalls or limitations? Has a contingency been outlined if the research does not go as planned? Is this research doable in the time allotted?
- Does the student discuss upholding the responsible conduct of research? Is he or she equipped with the knowledge and abilities necessary to conduct the proposed research and monitor progress? Work in a team environment? Is the writing definitive - does the student have ownership of this plan?
- What is the mentor's field of expertise? How strong is the mentor's interest and support for this research plan (documented by a GRFP reference letter)? Does the institution offer adequate space, equipment, supplies, computers (and other resources) that will enable this student to complete the proposed research?
- Is the student realistic about the **intellectual merit** of this plan and its potential for **broader impacts**?
- Should the GRFP invest in this student? What is the "value" of this fellowship to the student? What new knowledge and skills will this student acquire? Will this experience support the student's long range career goals?

Suggested Outline for a Research Plan, but Follow GRFP Instructions Precisely!

Title
Keywords
Introduction
Hypothesis
Research Plan
Anticipated Results
Intellectual Merit and Broader Impacts
References (Literature Citations)

Important:

- ✓ Precisely follow the essay instructions in **Fastlane GRFP**.
- ✓ Consult with your mentor(s) on this research plan.
- ✓ You must explicitly address the official scoring criteria!
- ✓ Use **boldface** paragraph headings to guide reviewers to the required essay sections.

Tip: If you have not yet formulated a research plan, your statement should be a scholarly discussion of a researchable topic. You will still need to convince the reviewers that you are prepared and qualified to conduct research *and* that your topic has intellectual merit and the potential for broader impacts.

Note: The literature citations (references) are included in the 2-page limit. Carefully select key studies that lead to your hypotheses, support the rationale for your methods, and underscore the importance of this work. In other words, don't make assertions that your research is important – document the need for this study with your citations!

10-Step Strategy for Developing a Plan of Research

- Step 1.** Carefully review this year's **program announcement**. If you are eligible to apply, register in **Fastlane-GRFP**. Look through the online application sections. Go to the Proposed Plan of Research section to find specific instructions on this essay. *Note:* The specific essay instructions are found only AFTER you login to the Fastlane GRFP. Copy the essay instructions and save them. Make notes.
- Step 2.** Now study the *two official scoring criteria* - **intellectual merit** and **broader impacts**. You will have to address both criteria essay explicitly. **Tip:** Learn **About the NSF*** – its mission, research priorities, commitment to diversity and international engagement. *The GRFP is seeking to invest in students who hold the potential to help the NSF achieve its goals.* Thus, in this essay, you should explicitly state how your research is aligned with the NSF's mission or goals or priorities or strategic plan.
- Step 3.** Review several articles from the top-tier journals in your field of study. This will help you learn how to write in a scholarly fashion, as well as cue you into the terms and tone used by scholars in your discipline.
- Step 4.** Create a **research plan outline**. Meet with your mentor to discuss the feasibility of your concept and the proposed methods. Verify that your intended graduate program has the resources (space, equipment, and supplies) to support your research activities. Confirm that your intellectual merit and broader merit are realistic for the scope of your proposed project. **Tip:** Ask about a reference letter too!
- Step 5.** Format your two page document according to the instructions in **Fastlane-GRFP**. You *must* include all of the required sections in this essay, and adhere to page limits, margins and font sizes!
- Step 6.** Commence writing from your outline. Begin by writing about the findings from the literature or previous studies. Build a strong case for your research hypothesis or question. Then write about specific methods and anticipated results. Next, address intellectual merit and broader impacts. Also consider how your research fits with the NSF mission and what a GRFP fellowship will enable you to do. Finally, write your introductory paragraph. It is far easier to do this *last*, because the details of your plan are complete. (This strategy also helps to prevent writer's block.) Your introductory paragraph must be powerful and compel the reviewers to read more about your research. **Tip:** Write freely for now – you can pare it down to the 2 page limit later.
- Step 7.** When you are finished, re-read the entire plan. Ask yourself: Does it sound scholarly? Are the methods clear? Do I take "ownership" of this research? Did I follow the directions exactly and include all of the required sections? Have I been selective with my citations? Analyze your writing. Revise.
- Step 8.** Take the *draft* plan to your mentor (and statistician, if appropriate). Ask: Is the writing clear? Are my methods sound and appropriate to the hypothesis or research question? Do I sound definitive? How can I improve the plan? **Tip:** Allow plenty of turn-around time for your mentor (or statistician) to review the plan and provide feedback (usually 1-2 weeks).
- Step 9.** Based on the feedback you receive, make revisions. Strive for a high degree of clarity and conviction in your writing style. Be specific and succinct! The reviewer must conclude that you are fully prepared to conduct this research, and that your future mentor and graduate institution have resources to support you.
- Step 10.** Ask your mentor to read the "final" version of all three essays. **Tip:** Avoid repetition with your Personal Statement and Previous Research essays, but make certain that they effectively work together to demonstrate your intellectual merit and broader impacts. For example, in your research plan, you can note that your research is based on your previous work and that you are properly trained to perform XYZ procedure or use XZY equipment. Rather than repeat details, use a parenthetical cross reference such as: (see Previous Research Experience).

***More NSF information:** **About the NSF**. NSF **priorities** and **strategic plan**. NSF paper on **broader impacts**. NSF page on **transformative research**. NSF Statement on the Responsible Conduct of Research (**RCR**). Follow the *specific* Research Plan instructions in **FastLane GRFP** and the official **NSFGRFP announcement**. See also **NSFGRFP.org**



Food for Thought: New GRFP language about working with international researchers

“ While applicants must enroll in a US-based institution, NSF encourages graduate students to establish collaborative relationships with international researchers. US graduate students should have the opportunity to take advantage of expertise, facilities, data, and field sites located abroad; to develop an international network of collaborators early in their career; to address problems of a global nature that require international cooperation; and to be prepared to operate successfully in international teams as they join the US science and engineering workforce.” Copied from source: [2011 GRFP Announcement](#)

GRFP Scoring Criteria (This is how your GRFP essays will be judged)

“Each application will be reviewed independently in accordance with the NSF Merit Review Criteria using all available information in the completed application. In considering applications, reviewers are instructed to address the two Merit Review Criteria as approved by the National Science Board - Intellectual Merit and Broader Impacts (NSF Proposal and Awards Policies and Procedures Guide, NSF 10-1). **Therefore, applicants must address explicitly each criterion in their written statements in order to provide reviewers with the information necessary to evaluate the application with respect to both Criteria as detailed below.**” Copied from source: [2011 NSF GRFP Announcement](#)

Two questions reviewers must answer:	How the NSF – GRFP defines the criteria:
What is the intellectual merit the proposed activity?	<p>“How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources? If international activities are proposed, are the proposed activities relevant and do they benefit the applicant?”</p> <p>“For example, panelists may consider the following with respect to the Intellectual Merit Criterion: the strength of the academic record, the proposed plan of research, the description of previous research experience or publication/presentations, references, and the appropriateness of the choice of institution relative to the proposed plan for graduate education and research.” Copied from source: 2011 GRFP Announcement</p>
What are the broader impacts the proposed activity?	<p>“How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society? Background information and examples of Broader Impacts activities are available at http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf”</p> <p>“For example, panelists may consider the following with respect to the Broader Impacts Criterion: the personal, professional, and educational experiences, the future plans and prior accomplishments in the integration of research and education, and the potential to reach diverse audiences and benefit society.” Copied from source: 2011 GRFP Announcement</p>

NSF’s Page Formatting Requirements for All 3 Essays

“Applicants must follow the instructions in the user guide and application module for completing each section of the application. The essays must be written using standard 8.5" x 11" page size, 12-point, Times New Roman font, 1" margins on all sides, and must be single spaced or greater. **Only references and footnotes may be a smaller font, no less than 10-point Times New Roman.** The Personal Statement, Previous Research Experience, and Proposed Plan of Research essays each have a maximum length of two pages, including all references, citations, charts, figures, and images. The optional Program Eligibility essay is limited to one page. Failure to comply fully with these requirements will eliminate the application from consideration by review panels. Additionally, applications that are incomplete (missing required transcripts and/or reference letters, or that do not have "submitted" status by the application deadline) are ineligible for panel review. Applicants are advised to submit applications early to avoid possible FastLane system delays on the deadline dates.” Copied from source: [2011 NSF GRFP Announcement](#)