# ~ Personal Statement (Essay) ~

Here's an example of what the reviewers will need to learn about you in these 2 pages:

- ✓ What motivates you to pursue advanced studies in a STEM field; *how* motivated are you?
- ✓ Your potential as a leader *and* collaborative team member – past roles; experience; your skill sets.
- ✓ Your intelligence, analytical ability and insight; academic achievement; extraordinary efforts to enhance your knowledge and skills *beyond* the classroom & lab (relates to **intellectual merit**).
- ✓ Your willingness to challenge assumptions; test new ideas; learn from mistakes; think creatively about solutions and move past barriers or failure; ability to find resources (relates to **intellectual merit**).
- ✓ Transferable skills & other qualities you possess that will make you an exemplary professional (e.g., time management; communication; writing; project management; initiative; ability to self monitor)
- ✓ Long range academic goals; career aspirations; perseverance toward goals; ways you intend to contribute to your future profession (relates to **broader impacts**).
- ✓ Your personal contributions to society – e.g., community engagement; volunteer service; helping others; engagement in diversity efforts; public outreach or education; etc. (relates to **broader impacts**).

## A Suggested Outline for the GRFP Personal Statement

**I. Introductory Paragraph:** In three to five sentences, make an interesting point about you, your research interests or your vision. Your writing must convince the reader that you are intelligent, innovative, articulate, and dedicated--uniquely qualified to receive this fellowship. Avoid clichés and the mundane.

**II. Next Section:** Describe any personal, professional, or educational experiences or situations that have prepared you and contributed to your desire to pursue advanced study in your field.

**II. Next Section:** Describe your competencies, team/interdisciplinary skills, and evidence of leadership potential. Use tangible examples of your work in research settings, if possible.

**IV. Next Section:** Discuss your career aspirations and how the NSF fellowship will enable you to achieve your goals.

**V. Next Section:** If you have not already done so, address the Intellectual Merit and Broader Impacts criteria.

**VI. Concluding Paragraph:** In three to five sentences, draw an interesting conclusion. Reflect on what you have learned, what your research means, or where you are headed. Bring closure to your essay.

**TIP:** The judicious use of **bold face** attracts the reviewers' eyes to key points. One strategy is to use paragraph subheadings such as "Goals." Another strategy: use bold face for key terms like "encourage diversity" and "benefit society" and to highlight your **intellectual merit** and **broader impacts**. This helps to assure that the reviewer does not overlook your efforts!

## 10-Step Strategy for Writing a GRFP Personal Statement

**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 **Personal Statement** 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. Now study the two scoring criteria in the announcement -- intellectual merit and broader impacts. Reflect on how your experiences are related to these criteria because you will have to address them in your essay. Make notes.

**Step 2.** Begin writing your first draft. Start with an engaging introductory paragraph. Set the tone or "theme" of your essay. Your goal is to convince the reviewers to continue reading your essay.

**Step 3.** Initially, develop just one or two paragraphs per required section. Use poignant examples to illustrate your ideas.

**Step 4.** Create transitions between paragraphs for reading "flow."

**Step 5.** Your final paragraph should tie the sections together, but avoid summarizing what you have written.

**Step 6.** Now go back and re-read each section. As space permits, add richness and details. Make logical breaks in lengthy paragraphs.

**Step 7.** Ask a friend, family member, study partner, or writing tutor to read your work for clarity and conviction. Did he or she find that your writing is compelling? Ask how you can improve it!

**Step 8.** Set your essay aside for several days. Reflect on the scoring criteria again. Will a stranger who reads it come to know the "real" you? Have you demonstrated your **intellectual merit**? Do your **broader impacts** ring true? How does your essay set you apart from other highly-qualified GRFP applicants? Will the reviewers recommend that the GRFP office invests in your future with a fellowship offer?

**Step 9.** Re-read and edit your entire essay. Make sure that your writing is succinct and intelligent, but lively!

**Step 10.** Make certain that you avoid repetition across the three GRFP essays, but that your tone and content is complementary.

Be subtle, but also weave in: Personal characteristics that will lead to your success (e.g. motivation, self-direction, dependability, persistence, communications, leadership, team player). Don't make claims or assertions - use examples! This essay establishes the overall impression you want to create with reviewers.

## Writer's Block?

### Here's a few potential topics to illustrate "Intellectual Merit" and "Broader Impacts"

- Reflect on key experiences (negative & positive) that shaped your career/research interests.
- Don't dwell on failures or negative experiences; *but* certainly use them to illustrate how you've changed, persevered, or overcome odds.
- Who are you mentors? Whose work do you follow? Why is this work important?
- How long have you been intrinsically motivated to conduct self study or your own research?
- What are your standards, values, and/or commitment to ethical research practices?
- What pressing research problems, social needs, or international issues capture your attention? Why?
- Leadership: How have you helped others? Did you work with someone or a group to address a problem?
- What are your "lessons learned" from working with your mentor? From internships? Group projects?
- How has volunteering, service learning or study abroad changed your thinking or goals?
- Share your goals and/or vision for the future. What do you want to accomplish? How do you intend to contribute to your profession? How will you to adapt to technological advances and other discoveries that will impact research methodologies of the future?
- How does your research agenda match the mission and priorities of the NSF?

**IMPORTANT: Required Page Format for all GRFP 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." Source: 2011 NSF GRFP Announcement

# ~ Previous Research Experience (Essay) ~

**Note:** This essay must also address your **intellectual merit** and **broader impacts**. Be explicit! In this essay, reviewers will be looking for specific information about your

- preparedness to conduct research based on your past **experiences** (e.g., undergraduate and graduate research; methods courses; projects and lab work; assistantships; employment; summer programs; internships; entrepreneurial research efforts; field research; study abroad or international engagement, etc.)
- **requisite skills** – those necessary to conduct your proposed research and report findings (e.g., responsible conduct of research; literature reviews; research design; appropriate data collection, analysis & protection; accurate and ethical interpretation of results; publications; professional presentations and posters; exposure to international faculty; public outreach with diverse audiences by gender, race, income, and/or ethnicity)
- ability to communicate, cooperate, and collaborate on domestic *and* international **teams** and **interdisciplinary settings.** Describe your **specific roles** (e.g., work with faculty, postdocs, and other students; % work load; your contributions to a research team; work across disciplines; consistent follow through; how prepared you are for future teamwork; conflict resolution; research ethics; co-authorship or co-presentations)
- determination and resourcefulness as an **independent researcher** (e.g., analytical skills; self direction; commitment; time management; monitors own progress; creative solutions; scholarship; finding domestic and international resources; flexibility to pursue a contingency when research does not go as expected)
- understanding of global events, current trends & emerging issues in your field (or the STEM workforce or STEM education) as *related to your research interests or proposed research;* demonstrated potential to become a **leader** in your discipline (e.g., national conferences; student committees; reading journals; grants)
- efforts to **support diversity**, **advance scientific knowledge**, or **benefit society.**

***Tip:*** The GRFP considers applicants on a case-by-case basis. If you do not have direct research experience, you can still write a compelling "previous research" essay. Be sure to explain the context of your situation--why you were unable to participate in research activities. (Some examples may include a lack of resources at your undergraduate institution or that you are making a change to a research-based degree program).

***Tip:*** Reviewers understand that students need to build and strengthen research skills. If your research plan will be a challenge with your current skill set, explicitly state that you are willing to ***learn*** the necessary methods, software, databases, and/or technology to conduct your research. Offer an example of your willingness to accept critique and direction or how you have sought assistance and mentoring or training. If you have specific plans for self-directed learning or research training to acquire new skills, be sure to mention!

## A 10-Step Strategy for Writing Your Previous Research Experience Essay

**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 **Previous Research Experience** 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. Now study the two scoring criteria in the announcement -- **intellectual merit** and **broader impacts**. Reflect on how your experiences are related to these criteria because you will have to address them in your essay.

**Step 2.** Create a few notes about your research experiences. Organize them in a table or **work sheet.** When you are finished, reflect on your experiences. Ask yourself: Which ones best demonstrate my knowledge and skills? Which experiences were the most challenging? The most meaningful? How did I broaden my skill repertoire? Increase my knowledge depth?

**Step 3.** Review NSF's description of **intellectual merit** and **broader impacts** in the **program solicitation.** These are the official scoring criteria, with examples included. Reviewers will look for evidence of your intellectual merit and broader impacts in this essay (and the other essays). Be explicit.

**Step 4.** Decide on a writing approach. For example, you can describe your undergraduate and graduate research experiences chronologically, or select your most meaningful experiences to discuss. Also think about life experiences that have prepared you to undertake research. Be specific: Describe a research experience, then summarize what you learned (e.g., equipment, procedures, analysis, controls). Alternatively, list a skill that you have acquired, and then offer concrete examples of how you applied that skill in the past.

**Step 5.** Do not attempt to write your introductory paragraph until you have finished describing your experiences, for this reason: As you are writing, you will discover an overall message or theme for your introduction. Remember that your introductory paragraph must be powerful and engage your reader! Note: Writing the introduction last can also prevent "writer's block."

**Step 6.** Keeping within the 2 page limit, list your **publications, presentations,** and **poster sessions**. Include national, regional, and campus events. Indicate if it was a refereed selection process. *Note:* References (only) can be listed in 10 point font **see the new GRFP announcement.**

**Step 7.** Now re-read the entire essay. Does the introduction engage the reader? Did you provide evidence of your **intellectual merit** and **broader impacts** with specific examples? If you worked on a team, is your role clear and accurate? Will a reviewer be convinced that you have the determination and necessary skills to undertake your proposed research? Are your past experiences connected to your future research?

**Step 8.** Ask a friend, family member, study partner, or writing tutor to read your work for clarity and conviction. Did he or she find that your writing is compelling? Does it make sense? Do your paragraphs "flow" with transition sentences, or is the writing choppy? Ask how you can improve it!

**Step 9.** Based on their feedback, begin re-writing. Strive for a high degree of clarity and conviction in your writing. When your essay draft is fine-tuned, ask your faculty mentor to review it with you. Ask: Will this essay convince a stranger of my skills and potential? Did I adequately address **intellectual merit** and **broader impacts?**

**Step 10.** Make certain that your other GRFP essays complement this one, but avoid repetition. Connect your ideas across the essays.

**IMPORTANT: Required Page Format for all GRFP 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."
Source: 2011 NSF GRFP Announcement

# Worksheet for Organizing your GRFP Previous Research Experiences Essay

**Instructions:** This chart can help you organize your experiences. Just make a few notes - do not write extensively. Place one project in each row. Write key points in each column. When you are finished, reflect on how these experiences have prepared you for future research. How can you best demonstrate your knowledge and skills? Which experiences were the most challenging? How did you broaden your skill repertoire? What do you need to learn? To write your Research Experience essay, follow the specific essay instructions. Address Intellectual Merit and Broader Impacts.

| Research Purpose & Your Specific Role | Methods, Equipment Procedures | Findings, Interpretation & Implications | Skills Gained & "Lessons Learned" | Intellectual Merit Broader Impacts |
|---|---|---|---|---|
| **Purpose:**<br>**Role:**<br>☐ **Undergrad** ☐ **Grad** | | | **Individual:**<br>**Team:** | |
| **Purpose:**<br>**Role:**<br>☐ **Undergrad** ☐ **Grad** | | | **Individual:**<br>**Team:** | |
| **Purpose:**<br>**Role:**<br>☐ **Undergrad** ☐ **Grad** | | | **Individual:**<br>**Team:** | |
| **Purpose:**<br>**Role:**<br>☐ **Undergrad** ☐ **Grad** | | | **Individual:**<br>**Team:** | |

# NSF Graduate Research Fellowship Program Unofficial Guide Sheet

## ~ 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 *las*t, 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?** | "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?"<br>**"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 |
| **What are the broader impacts the proposed activity?** | "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"<br>"**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 |

### 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

# Simple Outline for Your GRFP Research Plan – Unofficial Guide Sheet

**I. Introduction.** *In 4-5 powerful sentences, state the nature of the specific, researchable problem you intend to address (include your overarching aim and 1-3 specific research questions or hypothesis).*

*If your work is part of a team, interdisciplinary or international effort, summarize your specific role in 1-2 sentences.*

*Preparedness: In one sentence, summarize how your previous experiences have prepared you with the necessary knowledge and skills to undertake this study.(Your Previous Research essay will provide the details).*

## II. Literature Review and Preliminary Work

**II. A. Literature Review:** *List 3-4 key findings from the literature that demonstrate the scope of the problem you intend to address. If your research is interdisciplinary, include references from more than one discipline. Note the primary author's name and publication date. If possible, use nationally known researchers in the area(s) of study.*

| |
|---|
| 1st finding:<br><br>Citation: |
| 2nd finding:<br><br>Citation: |
| 3rd finding:<br><br>Citation: |
| 4th finding:<br><br>Citation: |

**II. B. Preliminary Work.** *In 3-4 sentences, describe the research **you and/or your mentor(s)** have accomplished to date related to the problem you intend to address. State your specific role in previous work, especially for collaborative, team, interdisciplinary or international work. Include your findings, even if preliminary or inconclusive.*

**II.C. Citations from related previous or preliminary work**. *Tip: If you have published or presented on research that is related to this plan, or if you have related publications under development, you should include them. If the citation(s) for your own work are in the Previous Research essay, be sure to remind the reader of that point.*

**III. Hypotheses or Research Questions.** *In the first column of the table below, list 2-3 hypotheses or specific research questions you intend to address. Each should be one sentence long.*

**IV. Research Plan**

**IV A. Methods.** *Next, for each hypothesis or question, list how you will collect and analyze data. Note if your future program has the lab space, equipment and supplies (e.g., chemicals, instruments, tools) you need. Be sure that your methods are appropriate for the corresponding hypothesis or research questions!*

| | III. Hypotheses or Research Questions | IV A. Corresponding Research Methods<br>**Note:** Your plan must be specific and rigorous! |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |

**IV. Research Plan -- *continued.*** Answer each of the following questions:

**IV. B. Compliance.** *If appropriate to your research, how will you protect human subjects and/or adhere to animal welfare regulations? Do you have RCR and/or related certification or will you obtain it?*

**IV. C. Timeline.** *How long will it take you to conduct this study and analyze the findings?*

**IV. D. Evaluation.** *How will you monitor and report your progress toward the study's completion?*

**IV. E. Limitations.** *Knowing that every study has potential barriers or limitations, what is your contingency plan if things go wrong (unexpected results midway in the study?)*

**V. Anticipated Results or Findings.** *In 3-4 sentences, specifically state what you expect to find. Be sure to give the rationale/basis for your assertion.*

## VI. Intellectual Merit and Broader Impacts

see http://www.nsf.gov/pubs/2010/nsf10604/nsf10604.htm and also http://www.nsfgrfp.org/how_to_apply/review_criteria#impacts and http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf

**VI. A. Intellectual Merit** *In 1-2 sentences, restate the magnitude of the problem and why this research is necessary.*

*In one sentence, explain how your research findings will fill a gap in the literature or advance discovery.*

*How does your research fit with the NSF's mission and priorities? Is this research potentially transformative?*

**VI. B. Broader Impacts.** *In 2-3 sentences, describe the potential outcomes of this research. Who will benefit -- and how? (e.g., citizens of your state, assisting the elderly, reduce national energy consumption, a global issue)*

*In 2-3 sentences, describe how you teach diverse audiences about your research, or involve people from underrepresented groups. How will you assure that the public has access and can understand your findings?*

*Summarize how you will communicate your research findings to the scientific community (within and across disciplines.)*

*If your work will help lead to enhanced the infrastructure for research and education (e.g., such as facilities, instrumentation, networks, or partnerships) state how.*

**VII. Future/Goals.** How will you pursue this research strand as part of your long range career goals? Where might this research lead – including interdisciplinary study? Think about why the NSF-GRFP should make an investment in you.

**VIII. Key Words:** *Similar to what you have seen in journal articles, NSF wants you to list several descriptors that best describe or categorize your study. Think about it this way: In the future, if someone uses a search engine to find your study, what words should they enter? (Keyword are added to the top of your essay).*

# Self Scoring Rubric for the GRFP Essays: Critique Your Drafts

***Instructions:*** This is NOT an official document. Rather, the purpose of this scoring rubric is to help you improve the quality of your essay drafts. After you have completed your essays, think about the overall impression you will make with reviewers. To be competitive, each criterion must rate at least a "2." However, to become highly competitive, proposals must also include elements from the "3" column. Suggestion: When you ask others for feedback on your draft essays, you can share a copy of this rubric. It will help them focus on the key elements you should improve in order to have a highly competitive application packet.

| | Not competitive | | Competitive | Highly competitive |
|---|---|---|---|---|
| **Sample Criterion** | **0** **(major revisions needed)** | **1** **(revisions necessary)** | **2** **(meets requirements)** | **3** **(elements of top essays)** |
| **1. Content** | | | | |
| a. answer the questions in their entirety | did not follow instructions; lacks clarity; digresses | some sections lack detail; circular discussion | exactly followed instructions; clear; adequate details | novel or intriguing approach; matches NSF's priorities, goals |
| b. **intellectual merit** * | hypothesis or research questions unclear; illogical; unrealistic; wrong methods | need for the research not well argued; methods lack detail; pitfalls | necessary skills; access to adequate resources; rigorous methods; appropriate citations | will advance knowledge; potentially transformative; international collaboration |
| c. **broader impacts*** | failed to address; includes assertions or assumptions; no past/current efforts | lacks specifics; too loosely connected to scope of work; promises too much | current outreach & teaching efforts; pubs & presentations; future plans well reasoned | interdisciplinary implications; benefits to society; engages diverse groups; partnerships |
| **2. Personal Qualities** (confirmed by strong reference letters) | | | | |
| a. characteristics | personality and characteristics do not emerge; cutesy; indifferent reference letters | too modest or brags; needs tangible *examples* of skills; generic reference letters | motivated; **ethical;** confident; dependable; shows initiative; determination; good letters | insightful; strives for excellence; solid performance; articulate; exceptional letters |
| b. potential to establish a research career | no discussion of having acquired prerequisite skills | lacks detail; does not connect related skills learned in other settings | team work; learns from past mistakes; problem solver; perseverance despite setbacks | range of research & outreach experiences; a leader; ability to monitor & assess self; grants |
| c. intellect & discipline-specific knowledge | fails to describe knowledge gained through college, work or life lessons | discusses educational experience only | essays are thoughtful & solidly constructed; discipline-related terms; scholarly | understands issues/trends in discipline; articulates a research agenda; analytical |
| d. potential for leadership in within or across disciplines | failed to address leadership | mentioned volunteerism or service, but did not address leadership skills | describes skills gained from leadership roles at school, in community, or other outreach | *active* in national organizations; commitment to discipline; peer mentoring; professionalism |
| **3. Mechanics** | | | | |
| a. format and page limit | did not follow instructions exactly; omitted keywords or title | research plan has missing section or is out of order; overuse of bold, italics, etc. | exactly followed instructions; consist format and font; citations included | effective use of white space, and bold face or italics; uses subheads for each section |
| b. readability | grammatical errors; jargon; malapropisms; | repetition; too many clauses in a sentence; wordiness; awkward wording | error free; highly understandable; good flow; transitions between paragraphs; succinct | scholarly use of discipline-related terms; essays complement one another |

*Discussion of review criteria http://www.nsfgrfp.org/how_to_apply/review_criteria

## General Guidelines* for NSF – GRFP Reference Writers

Source: FAQs for Reference Writers
https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane_Help/fastlane_help.htm#fastlane_faqs_introduction.htm

**1. What type of information should referees include in their GRFP reference letter?**
Indicate your department and institution, and how long you have known the applicant, and in what capacity.

- On the basis of your knowledge of the applicant's past and current research experience and activities, comment on his or her potential to do the following:
  - Succeed in graduate school
  - Conduct original research
  - Communicate effectively
  - Work cooperatively with peers and supervisors
  - Make unique contributions to his/her chosen discipline and to society in general
- If you have known or supervised other NSF Graduate Research Fellows, compare this applicant with them. Otherwise, compare this applicant with other successful graduate students or senior undergraduates that you have known in your institution or through your interactions with other institutions.
- Comment on the broader impacts of supporting this applicant, including his or her leadership potential in the chosen field of graduate work and in general, as a member of the scientific and technical community.

*Note* that the more specific (as opposed to generic) a letter you can provide, the better it is for the candidate. If you are the candidate's research supervisor, comment on the originality of his or her proposal, and communicate what role you played in assisting the student with the proposal.

**2. I have been requested to provide a reference letter for a Graduate Research Fellowship applicant. I have lost the email from FastLane on how to log in as a reference writer. Who can help me retrieve my login information?**
You can ask the applicant to resend the email to you. Or if you are unable to contact the applicant, contact the GRF Operations Center 1-866-673-GRFP (4737) (office hours: Monday-Friday, 8:30 am - 5:30 pm EST) or email help@nsfgradfellows.org.

**3. I lost my password for the GRFP application. How can I get it?**
On the Reference Writer login screen, click Forgot My Password to request that a temporary password be sent to you at your email address.

**4. I have been requested to provide a reference letter for a Graduate Research Fellowship applicant. I have lost the email from FastLane. I would like another copy of the email. Who should I ask to resend the email?**
Only the applicant can resend the email. Please contact the applicant to resend the email request to you.

* *Important:* Please follow the specific instructions for reference writers in the Fastlane GRFP.

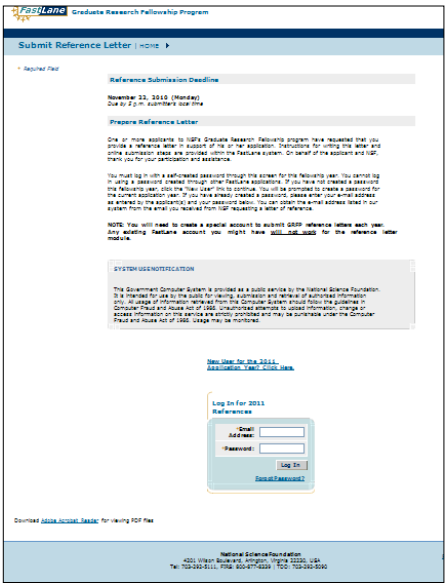
**Interested in being a NSF GRFP panel reviewer?** http://www.nsfgrfp.org/for_educators

**Information in this handout was copied directly from these NSF GRFP sources:**
http://www.nsf.gov/pubs/2010/nsf10604/nsf10604.htm ; https://www.fastlane.nsf.gov/grfp/ReferenceLetter.do?method=letter
https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane_Help/fastlane_help.htm#fastlane_faqs_introduction.htm &
http://www.nsfgrfp.org/how_to_apply/application_materials

created by RG Walker 09.08.10

# Overview *for* GRFP Reference Letter Writers

**How GRFP Reference Letters are Submitted:** Each fellowship applicant must first enter the name and email address of the reference writer into FastLane GRFP. The system then generates an email message to the reference writer with specific instructions on how to submit a letter directly into the system.




***Important Note for Faculty Writers:*** To submit reference letters, faculty members must login to a **special page** of the Fastlane GRFP rather than the main FastLane system for grant proposals. If you have not created a new GRFP password for this fellowship cycle, click "new user".

**Reference writer login (all reference letter writers)**:
https://www.fastlane.nsf.gov/grfp/ReferenceLetter.do?method=letter

- **Specific instructions** for reference writers are provided within the FastLane – GRFP system.
- **FAQs** for reference writers are found in the GRFP section of the Fastlane User Guide.

**Deadline for Letters: Same as the applicant's disciplinary deadline** *by 5 p.m. submitter's local time*

## *New !* Updated Language on the Review Criteria Specific to the NSF – GRFP

Source: http://www.nsf.gov/pubs/2010/nsf10604/nsf10604.htm

While the two review criteria of **Intellectual Merit** and **Broader Impacts** have not changed, this new GRFP solicitation offers a few examples of what information GRFP panelists consider when assessing each criterion.

- **Intellectual Merit: What is the intellectual merit of the proposed activity?**

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?

*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. Source: http://www.nsf.gov/pubs/2010/nsf10604/nsf10604.htm

- **Broader Impacts: What are the broader impacts of the proposed activity?**

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

*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.
Source: http://www.nsf.gov/pubs/2010/nsf10604/nsf10604.htm