

NSF GRADUATE TEACHING FELLOWS IN K-12 EDUCATION (GK-12)

Program Solicitation

NSF 05-553

Replaces Document 04-533



National Science Foundation
Directorate for Education and Human Resources
Division of Graduate Education

Letter of Intent Due Date(s) (required):

May 04, 2005

(due by 5 p. m. proposer's local time)

Full Proposal Deadline(s):

June 02, 2005

(due by 5 p. m. proposer's local time)

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

NSF GRADUATE TEACHING FELLOWS IN K-12 EDUCATION (GK-12)

Synopsis of Program:

This program supports fellowships and associated training that enable graduate students in NSF- supported science, technology, engineering, and mathematics (STEM) disciplines to acquire additional skills that will broadly prepare them for professional and scientific careers in the 21st century. Through interactions with teachers in K-12 schools, graduate students can improve communication and teaching skills while enriching STEM instruction in K-12 schools. In addition, the GK-12 program provides institutions of higher education with an opportunity to make a permanent change in their graduate programs by including partnerships with K-12 schools in a manner that is of mutual benefit to their faculties and students. Expected outcomes include improved communication, teaching and team building skills **for the Fellows**; professional development opportunities **for K-12 teachers**; enriched learning **for K-12 students**; and strengthened partnerships **between institutions of higher education and local school districts**.

Cognizant Program Officer(s):

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Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.074 --- Biological Sciences
- 47.070 --- Computer and Information Science and Engineering
- 47.076 --- Education and Human Resources
- 47.041 --- Engineering
- 47.050 --- Geosciences
- 47.049 --- Mathematical and Physical Sciences
- 47.078 --- Office of Polar Programs
- 47.075 --- Social, Behavioral and Economic Sciences

Eligibility Information

- **Organization Limit:**

Only academic institutions in the United States and its territories that grant masters or doctoral degrees in STEM disciplines supported by the National Science Foundation (NSF) may submit Proposals.

- **PI Eligibility Limit:** The PI must be a faculty member at the lead institution in a STEM discipline.
- **Limit on Number of Proposals:** 1. One per institution, either Track 1 or Track 2 for any one competition.

Award Information

- **Anticipated Type of Award:** Continuing Grant
- **Estimated Number of Awards:** 28 including Track 1 and Track 2 awards
- **Anticipated Funding Amount:** \$19,000,000 approximately in FY 2006 (pending availability of funds.)

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Letters of Intent (required):**
May 04, 2005
(due by 5 p. m. proposer's local time)
- **Full Proposal Deadline Date(s):**
June 02, 2005
(due by 5 p. m. proposer's local time)

Proposal Review Information

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

Summary of Program Requirements

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I. INTRODUCTION

The National Science Foundation (NSF) recognizes that graduate students in science, technology, engineering and mathematics (STEM) must be prepared with the necessary skills to face the career challenges of the 21st century. NSF also recognizes that STEM graduate students can contribute to the national effort to advance science education in K-12 schools through partnerships with K-12 teachers. These partnerships offer graduate students an opportunity to improve their teaching and communication skills while at the same time improving STEM content and teaching at the K-12 level. To support these opportunities, NSF continues to offer the Graduate Teaching Fellows in K-12 Education (GK-12) program.

Through the GK-12 program, institutions of higher education have an opportunity to make a permanent change in their graduate education programs and to create strong and enduring partnerships with K-12 schools.

GK-12 is one of three major fellowship/traineeship programs offered and managed by NSF's Division of Graduate Education (DGE) in the Directorate for Education and Human Resources (EHR). GK-12 is an NSF-wide activity supported by the Directorates for Social Behavioral and Economic Sciences (SBE), Computer and Information Science and Engineering (CISE), Biological Sciences (BIO), Education and Human Resources (EHR), Engineering (ENG), Geosciences (GEO), Mathematical and Physical Sciences (MPS), the Office of Polar Programs (OPP), and the Office of International Science and Engineering (OISE). Additional information concerning the program can be found in the GK-12 website. http://www.nsf.gov/funding/education.jsp?org=DGE&fund_type=4.

II. PROGRAM DESCRIPTION

The objectives of the GK-12 program are: 1) to support highly qualified graduate students in NSF- supported STEM disciplines through Fellowships to provide them with an opportunity to acquire additional skills that will broadly prepare them for professional and scientific careers in the 21st century; 2) to improve STEM instruction in K-12 schools; and 3) to provide institutions of higher education with an opportunity to make a permanent change in their graduate programs by including

partnerships with K-12 schools in a manner that is of mutual benefit to their faculties and students.

Expected project outcomes include:

- improved communication, teaching and team building skills for Fellows;
- content gain and professional development opportunities for GK-12 Teachers;
- enriched learning by K-12 students;
- incorporation of GK-12 like activities as an integral part of the institution's graduate programs in STEM;
- strengthened partnerships between higher education institutions and local school districts; and
- documentation of project outcomes and activities that can be used to improve graduate education.

GK-12 Fellows, selected by awardee institutions, will work directly with GK-12 Teachers in and out of the classroom to, for example: connect K-12 learning to scientific methods needed for further study in STEM disciplines; provide role models for future STEM professionals; enhance GK-12 teachers' content knowledge and understanding of principles of mathematics and the sciences; and jointly design and deliver K-12 science and mathematics instruction.

The Foundation offers two tracks within the GK-12 program: Track 1 (initial track) designed for new projects, and Track 2 (follow on track) designed for past or current projects to build, expand and improve on the initial experiences, to build sustaining features of their STEM graduate education programs, and to disseminate models for the nation. Awards within each track are not renewable.

Principal Investigators (PIs), school administrators, GK-12 Teachers and STEM faculty must work together in the development of the GK-12 proposal. It is strongly recommended that a partnership among all potential parties involved in the proposed project be developed early. For example, PIs and school administrators are encouraged to discuss such issues as the types of incentives and resources necessary to support participation of teachers in GK-12 projects and the projects that will best serve the needs of the participating schools and teachers.

Although training activities on the campus of an institution of higher education may be part of the project plan, it is expected that the preponderance of Fellows' activities with teachers and students will occur in K-12 schools. PIs are encouraged to establish collaborative arrangements with other institutions (e.g. industry, non-profit organizations, and museums) to support their activities.

III. ELIGIBILITY INFORMATION

A. Institutions*

Academic institutions in the United States and its territories that grant masters or doctoral degrees in STEM disciplines supported by NSF are eligible to apply. Projects may involve more than one institution, but a single institution must accept overall management responsibility. In any one competition, an institution may submit only one proposal as lead from either a single-institution or from a multi-institutional proposal, and this includes Track 1 or Track 2.

Non-academic institutions, industry, non-profit organizations and museums may serve as collaborating organizations.

*An institution is defined as a separate legal and fiscal entity, whether at the central or system level, or branch campus level, which can receive awards and which is separately and consistently identified at that level for federal research and development reporting purposes through a Federal Entity Number. NSF institution codes ARE NOT entity numbers.

B. Project Focus

Projects involving any of the STEM fields normally supported by NSF are eligible. Projects may draw participants from two or more departments within one institution or from more than one institution.

C. Principal Investigator

The PI must be a faculty member at the lead institution in a STEM discipline supported by NSF and should serve as the director of the GK-12 project. Any appropriate faculty or administrator at universities, K-12 schools or partnership institutions may serve as Co-PI.

D. Graduate Fellows

GK-12 Fellows will be selected by awardee institutions. They must be full time graduate students enrolled in STEM programs during their tenure as Fellows. In addition, they must be citizens, nationals or permanent residents of the United States. Foreign students who hold student visas are not eligible.

E. GK-12 Teachers

GK-12 Teachers should have sufficient experience in pedagogy to help improve the communication and teaching skills of the GK-12 Fellows.

IV. AWARD INFORMATION

A. Number and Size of Awards

The number and size of awards will vary depending upon the scope of projects and availability of funds. It is anticipated that approximately 28 total institutional awards will be made. Track 1 awards will range from \$300,000 to \$660,000 per year for up to three years. Track 2 awards will be for a total of up to five years with decreasing amounts each year as the institutional support increases; the amount in any one year not to exceed \$500,000 and the total award not to exceed \$2 million dollars.

The anticipated funding amount in FY 2006 is \$19 million.

B. Stipends and Allowances

The stipend for a graduate student will be \$30,000 for a 12-month tenure pending availability of funds. NSF also provides a cost-of-education allowance for tuition, health insurance, and normal fees of \$10,500 per year per student (for 12 months). If this allowance is not fully required, then it may be used to support other GK-12 student-related activities.

All Fellows will spend a minimum of ten hours per week providing direct assistance to K-12 Teachers and five hours of preparation outside of the classroom.

The stipends for GK-12 Teachers may be up to 15% of the funds allocated for a Fellow's stipend (i.e. 15% of \$30,000 or \$4,500 per year). The stipends for GK-12 Teachers may support participation in summer educational institutes, travel support for professional meetings, involvement in weekend and evening workshops, and after-hours mentoring of Fellows through the project.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent (required):

A Letter of Intent is required for all Track 1 and Track 2 proposals including those who were declined in previous years and are re-applying to the program. The Letter of Intent is not a preliminary proposal. It is a brief narrative that must include: 1) overview of the proposed project (indicate whether the project is Track 1 or Track 2); 2) principal investigator and list of faculty participants including their disciplines/departments and institutional affiliation; 3) K-12 school district participants and their affiliation; 4) disciplines to be covered by GK-12 Teachers and GK-12 Fellows; 5) Grade band: high school, middle school or elementary grades; and 6) Project setting: rural, urban, suburban.

Letters of Intent will be used by the program to guide the selection of reviewers. PIs should not expect feedback on their Letters of Intent beyond acknowledgement of their receipt.

Letters of Intent must be submitted via FastLane (www.fastlane.nsf.gov) and must be received by May 4, 2005.

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

The following instructions supplement the GPG guidelines:

Proposals must contain the following elements in the order indicated. Proposals that do not strictly adhere to the specified page and font limitations (given below) will be ineligible for consideration and will be returned without review.

1. **COVER SHEET FOR PROPOSALS:** Proposers must identify the program solicitation number stated at the beginning of this document in the program solicitation block on the proposal Cover Sheet. In the title section of the Cover Sheet, enter either "Track 1, GK-12" or "Track 2, GK-12" at the beginning of the proposal title.
2. **PROJECT SUMMARY:** This section, limited to one single-spaced page, prepared in a standard font (no smaller than Times New Roman 12), must be suitable for publication and should contain two sections (see below): 1) a List of Project Elements, followed by 2) a Project Summary. In addition, Track 2 proposals should specifically include a short summary of significant outcomes of their Track 1 project.

List of Project Elements

Title of Project:

Institution:

PI/Co-PI:

Number of Graduate Fellows per year:

Number of K-12 classes anticipated to be served/year:

Number of K-12 Teachers working with the Fellows:

School District Partners:

Target audience of the project (K-12 grade-band):

Setting: Urban, suburban or rural

NSF supported disciplines involved:

Project Summary: Include a brief description of the project, objectives, activity theme(s), and innovative aspects of the project. Indicate how Fellow-teacher partnerships will be initiated and enhanced during the lifetime of the project. Describe the nature of activities planned for the K-12 classes participating. **Explicitly indicate in clearly labeled sections the intellectual merit and broader impacts of the project proposed. NSF will return without review proposals that fail to address both of these criteria in the summary.** Include benefits to be achieved by all participants in the enterprise, the Fellows, teachers, K-12 students, and K-12 and higher education institutions. If the proposal is funded, NSF staff will edit the Project Summary, and will publish it along with abstracts of other awards.

3. **PROJECT DESCRIPTION:** This section is limited to 15 single spaced pages including any visual materials. It must be prepared in standard font no smaller than Times New Roman 12. The Project Description should include the following subsections (a-h):
 - a. **Results from Prior NSF Support:** Provide information about relevant funding that the PI or co-PI(s) received during the past five years related to GK-12 activities. For each project cited indicate the NSF award number, amount and period of support and PIs, co-PIs, and/or partner organizations involved. Indicate how the proposed project is different than previously funded NSF proposals.
 - b. **Goals and Objectives:** Provide the conceptual focus, goals, and objectives of the project. Describe the activities that will form the foundation for the project.
 - c. **Project Plan:** It is important to indicate in this section not only what activities will be conducted but also how they will be implemented. Include disciplines addressed and mechanisms of operation. Indicate the number of Fellows that will be available in any given school district and the specific schools involved. Indicate how the Fellows will be recruited, selected and assigned to schools and classes. Outline plans to prepare Fellows to serve as resources to GK-12 Teachers. Incorporate training activities for Fellows from disciplinary or multidisciplinary fields, integrating established mathematics and science standards. Clearly state what the Fellows will be doing and how they will enhance K-12 STEM instruction in the specified school district,

including as appropriate, their role in implementing inquiry-based instructional strategies and materials. Describe introductory workshops and professional development activities for GK-12 Teachers.

Describe the level and type of participation by the institution(s) of higher education, K-12 school district(s), and any collaborating organization(s). Indicate any relevant history of the higher education department(s) in K-12 involvement and how the proposed activities will be aligned with educational needs of K-12 schools. Describe implementation plans involving special populations in K-12 schools (e.g. women, underrepresented minorities, students at risk, with disabilities, with English as second language, etc.).

Clarify in sufficient detail the benefits to Fellows, GK-12 Teachers, universities and K-12 schools.

Include plans to incorporate GK-12 like activities as an integral part of STEM graduate programs.

- d. **Recruitment and Selection:** Describe plans and procedures for the recruitment and selection of Fellows, including specific provisions for success with women, underrepresented minorities and persons with disabilities. Provide reasonable estimates of the number of potential Fellows eligible and likely to be interested in participating. Also describe plans for the recruitment and selection of GK-12 Teachers.
- e. **Organization, Management, and Institutional Commitment:** The Principal Investigator (PI) will have overall responsibility for the administration of the award, the management of the project, and interactions with the NSF. The PI and the home institution are expected to develop an administrative structure that enables faculty, GK-12 teachers, school administrators, Fellows, and others involved in the group effort to interact productively during the award period. The PI is expected to be an integral participant in the education and training activities of the GK-12 project. Include plans and procedures for the development of a management team for the proposed activity indicating how the responsibilities among team members will be allocated (e.g. who will select the Fellows, who will coordinate activities of Fellows and GK-12 Teachers).

Include assurances from the institution of higher education that the NSF funds will not supplant extant financial resources assigned to science and mathematics education and provide similar assurances from the school district in the statement from the superintendent of the K-12 district described below.

Describe how the activities will be sustained after the period of NSF funding. Provide a clear statement elaborating which of the proposed activities are likely to be institutionalized by the end of the grant period, and which of the proposed activities will require further sources of support in order to be continued.

- f. **Evaluation:** Describe an evaluation plan, including the performance indicators and other specific measures that will be used by the project team to assess the project's success in meeting its goals and objectives. Although each project should propose its own measures, some later standardization is anticipated so that NSF can conduct a program-wide evaluation of effectiveness. This section is expected to include:
- For Fellows: provide basic data related to the operation of the proposed plan including number of Fellows indicating the number of women, underrepresented minorities and students with disabilities participating; indicate how the effectiveness of the training of Fellows will be measured; how the effects of the program on Fellows will be determined;
 - For GK-12 Teachers and Schools: number of teachers involved including the number of women, underrepresented minorities and teachers with disabilities participating; indicate how the effects of the program on GK-12 teachers and schools will be measured; how the impact of the program on the school districts will be evaluated;
 - For Faculty and Universities: indicate how the impact of the program on participating faculty and universities participating will be measured and evaluated;
 - Indicate plans for evaluation of the efficacy of project activities, including the development of a process for collecting and interpreting evaluative data and attributing impacts; and
 - Include timetables and metrics for accomplishments and indicate who will be responsible for monitoring and evaluating the progress of this effort.

Project participants (PIs, Fellows and GK-12 Teachers) should be prepared to submit Annual

Reports via FastLane; add information annually to a web based GK-12 specific data collection system ;participate in long-term follow-up activities supported by NSF; and cooperate in an overall program evaluation to be conducted by the NSF.

- g. **List of Faculty Participants:** Include departmental and, if appropriate, institutional affiliation of all faculty participants expected to mentor Fellows or to otherwise play an important role in the project. Indicate how the Fellows' advisors will be involved and how they will provide feedback to the Fellows.
- h. **School District Involvement:** Include a brief summary of school district participation and a list of participating school districts. A statement from the superintendent(s) of the participating K-12 school district (s) must also be included with the application. The statement(s) with the original signature may be electronically scanned and incorporated as a PDF file into the Supplementary Documentation (see item 7 below).

Additional Elements for Track 2 Proposals:

In the Results from Prior NSF Support (section V. 3. a.) Track 2 proposals should also describe the earlier GK-12 project(s), their outcomes, ongoing progress and lessons learned. If appropriate indicate how these serve as a base for or will be incorporated into the proposed project. Include specific outcomes for Fellows, GK-12 Teachers and students; the nature of current partnerships (especially with schools); the interest and contributions of faculty and administrators including those that are not members of the leadership team; and a summary of the supporting infrastructure.

In the Project Plan (section V. 3. c.) indicate how participating Fellows, GK-12 Teachers and schools will be followed longitudinally to determine indicators of project impact and sustainability such as: length of time that Fellows take to degree completion compared to other graduate students, career choices, outreach efforts and teaching practices adapted; increased teacher expertise in science and mathematics, teaching methods adapted, participation in professional development activities in STEM; number of schools or teachers requesting GK-12 partnerships, changes in student STEM interest and competence level; number of faculty and students participating in GK-12 activities, changes in faculty and/or department support and practices related to GK-12 activities, and overall impact on the institution.

Indicate how you plan to implement GK-12 type activities as an element of the institution's STEM graduate education program(s); how you plan to establish K-12-university partnerships; and how they will serve as a mechanism to advance STEM education.

Indicate the project's potential as a national model and as contributor to research on STEM graduate education. For example, indicate how your project is contributing to building a research community that can address current trends in STEM graduate education and how your project is broadening the diversity of students in STEM graduate education.

In the Organization, Management and Institutional Commitment Section (V. 3. e.), describe the infrastructure already developed to support the GK-12 project, include any plans for changing it, the reasons for the planned changes, and the partnership's plans for maintaining this infrastructure once the partnership has become self-sustaining. Indicate strategies and commitments for sustainability of funding beyond NSF support.

- 4. **REFERENCES CITED** (see GPG, Chapter II Section C.4): Any literature cited should be specifically related to the proposed project, and the Project Description should make clear how each reference has played a role in the motivation for or design of the project.
- 5. **BIOGRAPHICAL SKETCHES** (see GPG, Chapter II, Section C.5): This section must not exceed 2 pages per individual. For each of the personnel listed by name on the budget page and each person included on the list of faculty participants (Item 3g), provide a Biographical Sketch highlighting information that will help in understanding the qualifications that this individual will bring to the GK-12 project. This Biographical Sketch should include information about recent training activities such as the number and names of graduate students who carried out research under the faculty member's direction in each of the last three years. List the titles of courses taught by the faculty member during the past three years and include other relevant activities, such as organization of workshops or special courses. Include information related to activities conducted in collaboration with K-12 schools or other educational organizations. List current and past collaborators including those with whom the faculty member has co-authored papers within the past four years.
- 6. **CURRENT AND PENDING SUPPORT** (see GPG Chapter II Section C.7): For each PI and Co-PI, you must indicate

time commitments for all current and pending support from all agencies. This is not limited to NSF or other federal agency support.

- 7. SUPPLEMENTARY DOCUMENTATION:** This section should not exceed 10 pages. It must include a statement from the superintendent(s) of the local K-12 school district(s) involved. The local superintendent(s) or chief school officer (s) who can represent the school district and honor its financial commitments must sign this statement. This statement should include some background about participating schools and demographics of the student population; specific STEM needs of participating schools or of the district in general; specific conditions in the K-12 schools in which Fellows are expected to operate (e.g. availability of technology and/or scientific materials); coordinated plans of the district to receive GK-12 Fellows into its schools; financial commitments or other support to be provided for GK-12 Teachers (e.g. release time, conference attendance, workshop participation, professional development units); and incentives, recognition and awards to be provided to GK-12 Teachers for their participation in the GK-12 project.

Proposers are reminded to identify the program announcement/solicitation number (05-553) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

Cost sharing is not required in proposals submitted under this Program Solicitation.

Other Budgetary Limitations:

The costs of participant (Fellows, GK-12 Teachers) travel, the costs of workshops, and the cost of education for Graduate Fellows should be listed under Participant Support Costs (Section F), as should the stipends for Fellows and GK-12 Teachers. Separate the costs for Fellows and GK-12 Teachers in the Budget Justification. If there are compelling reasons for listing these costs elsewhere in the budget, these reasons must be stated in the Budget Justification. None of these costs should be included in the base used to calculate Indirect Costs.

Budget Preparation Instructions:

Provide a Summary Proposal Budget for each year of support requested. FastLane will create the cumulative budget automatically.

Recognizing the importance of infrastructure support and the significant involvement of faculty and GK-12 Teachers, up to 30% of the budget may be designated for direct costs other than Fellows' stipends, GK-12 Teacher stipends and cost-of-education allowances. These funds are intended to supplement institutional and school district resources in support of GK-12 activities.

Funds may be requested for personnel to develop and construct special instruments, for the purchase of computer software, or for other special-purpose materials related to the project. Use of inquiry-based educational materials such as those developed under NSF support is encouraged. The total requested for software and special-purpose materials may not exceed \$10,000.

Funds may be requested for professional development, training or workshop participation for GK-12 Teachers.

Funds should be included for the PI and up to three participants to attend an annual meeting convened by NSF in the Washington, D.C. area. The participants should include at least one Fellow and one GK-12 Teacher.

Budget Justification: This section must not exceed 3 pages. A brief justification for funds in each budget category should be provided. List next to each item commented upon in the Budget Justification the corresponding letter and number of that item on the Budget Page.

C. Due Dates

Proposals must be submitted by the following date(s):

Letters of Intent (required):

May 04, 2005

(due by 5 p. m. proposer's local time)

Full Proposal Deadline(s):

June 02, 2005

(due by 5 p. m. proposer's local time)

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the [Grant Proposal Guide](#) for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to

make judgments.

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 the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

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?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria:

For both Track 1 and 2 proposals:

In light of the GK-12 program's objectives, reviewers will be asked to consider the above two merit review criteria with emphasis placed on:

- Expected benefits to Fellows, their institutions of higher education, K-12 students and their schools, and GK-12 Teachers.
- Team composition and extent of collaboration between the proposing institution(s) of higher education and the participating K-12 school district(s).
- Effectiveness of the plans and procedures for the recruitment and selection of Fellows and GK-12 Teachers, including attention to diversity.
- Intellectual basis for and quality of the planned education and training activities for Fellows and GK-12 Teachers.
- Consistency of project designs with mathematics and science standards established by national organizations, states, and school districts.
- Importance of the disciplinary or multidisciplinary perspective, including its effectiveness as an intellectual focus for the project.
- Appropriateness of the administrative plan and organization structure in assuring fair and effective allocation of group resources.
- Appropriateness of the plans for data collection including evaluation of project performance and follow up.
- Appropriateness of the budget.
- Sustainability of the project activities beyond the period of NSF funding.
- Appropriateness of the plans for assessment of project performance in meeting objectives and expanding the knowledge base in STEM graduate education and disseminating results to appropriate professional communities.

Priority will be given to Track 1 proposals from institutions that have not received a previous GK-12 award.

Additional criteria for Track 2 include:

- The quality and outcomes of the previous GK-12 project(s) and its dissemination.

- The likelihood for sustainability; the presence of a clear plan for incorporating GK-12 opportunities into the institution's STEM graduate education, including the necessary supporting infrastructure.
- The potential of the project for serving as a national model and for contributing to scholarly research about graduate education in STEM.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at <http://www.gpo.gov>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

In addition to submitting Annual Reports via FASTLANE, PIs and Project participants should be prepared to cooperate in an overall program evaluation to be conducted by the NSF and to provide information annually to a web based GK-12 specific data collection system (See Section V Proposal Preparation and Submission Instructions; A. Proposal Preparation Instructions, Full Proposal Instructions; Subsection 3 Project Description; Subdivision f. Evaluation)

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Sonia Ortega, Program Director, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8697, fax: (703) 292-9048, email: sortega@nsf.gov
- Carolyn L. Piper, Program Manager, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8697, fax: (703) 292-9048, email: cpiper@nsf.gov

For questions related to the use of FastLane, contact:

- Yvette D. Jackson, Information Technology Specialist, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-4925, fax: (703) 292-9048, email: yjackson@nsf.gov
- FastLane Help Desk, telephone: 1-800-873-6188, email: fastlane@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF *E-Bulletin*, which is updated daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's *Custom News Service* (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

Research on Learning and Education (ROLE)

The NSF's Division of Graduate Education (DGE) and the Division of Research, Evaluation and Communication (REC) offer an opportunity to support research projects on graduate education (see <http://www.nsf.gov/pubsys/ods/getpub.cfm?nsf05529>). This opportunity encourages proposals for research that can serve as a basis for broadening participation and

strengthening graduate education in science, technology, engineering, and mathematics (STEM) disciplines as well as graduate education in STEM education. Successful proposals will demonstrate expertise in education research and/or social science research methods as well as knowledge about STEM graduate education. The objective is to build a research community that can more effectively address current trends in STEM graduate education such as:

- Emerging STEM research fields, particularly cross-disciplinary ones;
- Changes in skills expected for STEM professionals;
- Efforts to broaden the diversity of students in STEM graduate education;
- The effects on graduate education of growing international cooperation; and
- Uses of new technologies in both education and research.

Proposals may address these topics and others directly related to questions of interest to GK-12 projects. For example: Does the GK-12 program reach and attract students who would otherwise be less likely to start and complete PhD programs in STEM disciplines? What has been the impact of GK-12 on participating graduate student interest, particularly after graduation?

Online Evaluation Resource Library (OERL)

The Online Evaluation Resource Library, funded by NSF, provides guidelines for how to improve evaluation practice using Web site resources. It provides a large collection of sound plans, reports and instruments from past and current project evaluations in several content areas.

OERL resources include instruments, plans, and reports from evaluations that have proven to be sound and representative of current evaluation practices. It also includes alignment tables that contain criteria and a glossary to help with the development of your own plans, reports and instruments.

Principal investigators and GK-12 project evaluators are encouraged to consult OERL at: <http://oerl.sri.com>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090

• **To Order Publications or Forms:**

Send an e-mail to: pubs@nsf.gov

or telephone: (703) 292-7827

• **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

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