DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES (EHR)

$892,000,000
+$19,240,000 / 2.2%

EHR Funding
(Dollars in Millions)

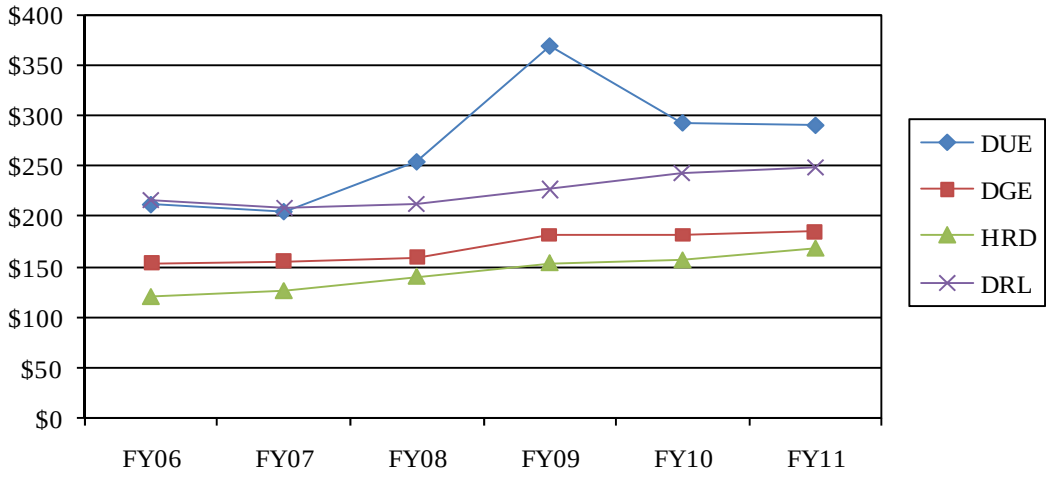
	FY 2009 Omnibus Actual	FY 2009 ARRA Actual[1]	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Percent
Division of Human Resource Development (HRD)	$154.08	-	$156.91	$168.91	$12.00	7.6%
Division of Graduate Education (DGE)	181.67	-	181.44	185.26	3.82	2.1%
Division of Research on Learning in Formal and Informal Settings (DRL)	226.68	-	242.00	247.85	5.85	2.4%
Division of Undergraduate Education (DUE)	283.08	85.00	292.41	289.98	-2.43	-0.8%
Total, EHR	**$845.52**	**$85.00**	**$872.76**	**$892.00**	**$19.24**	**2.2%**
Research	178.74	-	191.24	191.44	0.20	0.1%
Education	638.45	85.00	650.80	668.73	17.93	2.8%
Infrastructure	15.24	-	15.98	15.71	-0.27	-1.7%
Stewardship	13.08	-	14.74	16.12	1.38	9.4%

Totals may not add due to rounding.

[1] NSF carried forward $15.0 million in ARRA appropriations for the Science Masters program. Awards will be made in FY 2010.

EHR promotes excellence in science, technology, engineering, and mathematics (STEM) education and learning in support of continued U.S. economic and research preeminence. The goal of EHR activities is to strengthen U.S. STEM learning at all levels, in both formal and informal learning environments. EHR promotes excellence in STEM education through its highest priorities: the development of a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians, and educators; creation of a well-informed citizenry; and the design, development, and evaluation of new tools, approaches, and models for learning. These priorities support access to the ideas and tools of science and engineering for all. EHR's investment in education, research, and infrastructure enhances the quality of life of all citizens and the health, prosperity, welfare, and security of the Nation while educating the STEM workforce of the future.

EHR Subactivity Funding
(Dollars in Millions)



Appropriation Language

For necessary expenses in carrying out science, mathematics and engineering education and human resources programs and activities pursuant to the National Science Foundation Act of 1950, as amended (42 U.S.C. 1861-1875), including services as authorized by 5 U.S.C. 3109, authorized travel, and rental of conference rooms in the District of Columbia, ~~$872,760,000~~*$892,000,000,* to remain available until September 30, ~~2011: *Provided*, That not less than $55,000,000 shall be available until expended for activities authorized by section 7030 of Public Law 110-69: Provided further, That not less than $32,000,000 shall be available until expended for the Historically Black Colleges and Universities Undergraduate Program~~*2012.*

Education and Human Resources
FY 2011 Summary Statement
(Dollars in Millions)

	Enacted/ Request	Carryover/ Recoveries	Expired	Total Resources	Obligations Incurred/Est.
FY 2009 Omnibus	$845.26	$0.28		$845.54	$845.52
FY 2009 ARRA	100.00			100.00	85.00
FY 2010 ARRA	-	15.00		15.00	15.00
FY 2010 Estimate	872.76	0.02		872.78	872.78
FY 2011 Request	892.00			892.00	892.00
$ Change from FY 2010 Estimate					$19.22
% Change from FY 2010 Estimate					2.2%

Totals may not add due to rounding.

Explanation of Carryover

Regular Discretionary

Within the **Education and Human Resources (EHR)** appropriation, a total of $19,473 was carried forward into FY 2010.

American Recovery and Reinvestment Act of 2009 (ARRA)

Note: The ARRA chapter contains an obligation plan for all ARRA appropriated funds carried forward into FY 2010.

Within the **Education and Human Resources** appropriation, the Division of Graduate Education carried forward a total of $15.0 million for the Science Masters program.

- Reason for Carryover: Solicitation was issued late in FY 2009.
- Expected Obligation: Awards expected in Q2/Q3 FY 2010.

EHR in Context

Solving today's challenging education problems and anticipating tomorrow's learning opportunities are key to preparing a STEM workforce ready for innovation and a public informed about science in their lives. EHR provides national leadership by investing in research and development to build evidence, knowledge, and experience that serve as the basis for solving problems and creating opportunities for STEM learning.

The Nation's capacity for STEM innovation requires the full engagement of all people in the Nation, including women, persons with disabilities, and members of groups historically underrepresented in STEM. Building the STEM workforce for tomorrow involves offering cutting-edge educational opportunities at all levels, focusing on both the interdisciplinary and specialized knowledge needed by Ph.D.-level scientists and K-12 teachers, and the general understanding of scientific inquiry needed by a STEM-literate populace.

President Obama has said, "the countries that out-teach us today will out-compete us tomorrow." Building and sustaining a K-12 STEM teaching force and equipping them with the most innovative and effective tools and models for their classrooms is essential to the Nation's future. It is also essential to improving student learning and performance on standards-based assessments both in mathematics and science. In this cyber age, methods and tools for learning can be accessed by any learner, at anytime, anywhere, and EHR is a leader in stimulating the research and development to bring such tools to learners effectively. All of this requires a foundation in research and evidence. This research base allows for strategic investments in development of innovations with real promise of promoting learning. It also provides a sound basis for scaling-up the most effective innovations in collaboration with other agencies, such as the U.S. Department of Education.

EHR is key in enacting NSF's charge, in accordance with the NSF Act of 1950, as the principal federal agency to promote science and engineering (S&E) education. EHR supports projects across S&E disciplines, as well as efforts to prepare the workforce and citizenry in science and technology. Programs in the directorate support the design, development, implementation, and study of innovations in this cyber era. EHR programs feature strategic partnerships and collaborations; identification and development of the knowledge and skills needed for the workforce of tomorrow; and research on STEM learning and education. EHR programs emphasize the development of the workforce through scholarships and fellowships to graduate and undergraduate students in STEM fields and the preparation and continuing professional development of STEM teachers.

EHR is committed to participation in a coordinated STEM education research and evaluation agenda across the government. In particular, EHR is poised to build on previous and emerging collaborations with the U.S. Department of Education, and to use NSF's unique experience and knowledge base in STEM education to identify research and evaluation priorities and to consider appropriate standards of evidence for various stages of research and development cycles. Specifically, the two agencies are embarking jointly on possible collaborations and complementary initiatives to help states improve K-12 student learning in STEM by building and sharing knowledge of effective curricular and instructional practices, and how they can be implemented at scale.

Factors Influencing the Allocation Across Divisions and Major Programs

The EHR FY 2011 Request reflects the directorate's commitment to advancing three priority areas:

- *Preparing a STEM workforce ready to lead innovation and address national needs:* This requires the involvement of the full range of talent and diversity in the Nation. The EHR FY 2011 Request reflects a new investment ($103.10 million) within the Division of Human Resource Development (HRD) for a comprehensive program aimed at increasing participation of students from groups traditionally underrepresented in STEM. This effort will engage undergraduates at historically Black, Tribal, and Hispanic-serving institutions to build capacity by drawing on research and best practices across the range of institution types represented in HRD programs. It will realign and build on the existing undergraduate HRD programs: Historically Black Colleges and Universities-Undergraduate

Program (HBCU-UP), Louis Stokes Alliances for Minority Participation (LSAMP), and Tribal Colleges and Universities Program (TCUP).

- *Increasing the number of NSF graduate fellows*: This is essential in building the capacity of the future STEM workforce, a high priority for EHR and the Division of Graduate Education (DGE). In FY 2011, EHR continues to work toward the goal of tripling the number of new graduate research fellows by FY 2013.
- *Expanding evaluation activities, specifically to build capacity, tools, and methods in STEM education program evaluation, and for program improvement:* This is supported in FY 2011 by increased investment in the program evaluation activities of the Division of Research on Learning in Formal and Informal Settings (DRL). As part of the Administration's government-wide initiative to strengthen program evaluation, these resources will also allow cross-agency collaboration to improve STEM education program evaluation, particularly in the areas of teacher professional development and immersive science research experiences for teachers. Evaluation experts at the Office of Management and Budget and the Council of Economic Advisers will work with NSF, the Department Education, and other research agencies during the planning, design, and implementation of these STEM education studies.

In addition, efforts in the Division of Undergraduate Education (DUE) to transform undergraduate STEM education are sustained in FY 2011 through strategic focus in its core programs. This includes the identification of effective approaches to increasing undergraduate STEM program completion and entry into STEM or STEM-related fields. For instance, the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) supports the adaptation and implementation of best practices that will lead to an increase in the number of students obtaining STEM degrees.

EHR Administration Priority Programs and NSF Investments

EHR Administration Priority Programs and NSF Investments

(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Change Over FY 2010 Estimate Percent
Graduate Research Fellowship (GRF)	$107.00	-	$102.58	$107.58	$5.00	4.9%
Advanced Technological Education (ATE)	51.85	-	64.00	64.00	-	-
Climate Change Education Program (CCE)	9.95	-	5.50	5.50	-	-
Science, Engineering and Education for Sustainability (SEES)	N/A	N/A	11.50	12.00	0.50	4.3%
Cyberlearning Transforming Education (CTE)	N/A	N/A	25.33	25.33	-	-

In FY 2011, EHR will focus on NSF programs that support students and the next generation of environmentally engaged STEM scientists and engineers. The budget also invests in the education of technicians and critical priorities in climate change education.

Specific EHR investments include:

- *Graduate Research Fellowship (GRF) program:* The GRF program, housed in DGE, will focus on enhancements to the current reporting and communication system to effectively support the projected increase in the number of active fellows. As a component of NSF's High Priority Performance Goal on workforce, NSF will enhance the current reporting system to allow effective extraction of data

from the reporting of annual activities on innovations and such research themes as climate change, clean energy, cyber science, and other emerging research areas. Total NSF funding for GRF increases by $22.32 million to $158.24 million and EHR's contribution increases by $5.0 million to $107.58 million, supporting the Administration priority to triple the number of new graduate research fellowships from 1,000 in FY 2008 to 3,000 by FY 2013.

- *Advanced Technological Education (ATE)*: ATE, housed in DUE and co-led by DRL, focuses on educating technicians who have the understanding, knowledge, and abilities to creatively support science and engineering. ATE expects to receive many proposals in a variety of energy fields that include all forms of alternative energy, including wind and solar power, biofuels, and alternative fuel vehicles. ATE program leaders will collaborate with representatives from other governmental agencies and will engage in a series of regional meetings about renewable energy and other related energy issues. As an Administration priority, this program is on a growth trajectory begun in FY 2010 to increase funding to $100.0 million by FY 2013. In FY 2011, ATE requests continued support of $64.0 million.
- *Climate Change Education (CCE):* As an Administration priority, the total NSF request for CCE remains at $10.0 million in FY 2011, including the EHR continuing contribution of $5.50 million. The Directorates for Geosciences (GEO) and Biological Sciences (BIO) and the Office of Polar Programs (OPP) are maintaining support for this multi-disciplinary, multi-faceted climate change education program to enable a variety of partnerships, including those among K-12 education, higher education, the private sector, and related non-profit organizations, in formal and informal settings, as well as relevant education and/or climate-related policymakers. A key goal will be to increase knowledge about the science of climate change in formal and informal learning settings. It will support individual investigators and multidisciplinary teams of STEM researchers and educators in a range of activities, including those local, regional, and/or global in scope.
- *Science, Engineering, and Education for Sustainability (SEES):* In FY 2011, EHR will invest $12.0 million in the NSF-wide Science, Engineering, and Education for Sustainability portfolio to integrate efforts in climate and energy science and engineering. EHR's investment will create and study efforts to inspire young people to pursue careers in renewable energy, sustainable development, and the environment. Additionally, STEM educators and researchers will participate in activities focused on integrating research into deliberations on pressing problems in renewable energy and sustainable development.
- *Cyberlearning Transforming Education (CTE):* EHR will invest $25.08 million in this new multidisciplinary program to fully capture the transformative potential of advanced learning technologies across the education enterprise. This will catalyze new approaches to STEM learning for students and for workforce development. Additionally, it will provide the pathways and resources to study the learning process itself. The total FY 2011 Request for CTE is $41.28 million and includes support from the Directorates for Computer and Information Science and Engineering (CISE) and Social, Behavioral, and Economic Sciences (SBE). EHR's investment is focused through the following programs: Discovery Research K12 (DR-K12), $4.08 million; Informal Science Education (ISE), $2.50 million; Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES), $1.50 million (this program was formerly known as Course, Curriculum and Laboratory Improvement (CCLI)); Centers of Research Excellence in Science and Technology (CREST), $1.0 million; and the National STEM Education Distributed Learning (NSDL) program's budget of $16.0 million.

For more information on Administration priority programs and NSF investments, please refer to the Overview and NSF-wide Investments chapters.

Program Evaluation and Performance Improvement

The Performance Information chapter provides details regarding the periodic reviews of programs and portfolios of programs by external Committees of Visitors and directorate Advisory Committees. Please see this chapter for additional information.

All EHR programs require project-level evaluation, and findings from these are aggregated and considered in program-level strategic planning and refinement at the program and division level. In addition, program evaluations are ongoing to assess program quality and impact, and the results of these formative and summative evaluation activities are essential in the continued shaping of program directions and emphases. See the Performance Information chapter for additional information.

To ensure the quality of EHR's processes for handling proposals and recommending proposals for awards, EHR convenes Committees of Visitors (COV) comprised of expert external evaluators to review all programs every three years. In FY 2011, COV reviews are scheduled for DRL (Informal Science Education (ISE) and Innovative Technology Experiences for Students and Teachers (ITEST), DUE (Math and Science Partnership (MSP) and the Robert Noyce Teacher Scholarship (NOYCE) Program), DGE (Graduate STEM Fellows in K-12 Education (GK-12) and Integrative Graduate Education and Research Traineeship Program (IGERT), and HRD (Louis Stokes Alliances for Minority Participation (LSAMP)).

Number of People Involved in EHR Activities

	FY 2009 Omnibus Estimate	FY 2009 ARRA Estimate	FY 2010 Estimate	FY 2011 Estimate
Senior Researchers	7,720	832	8,130	8,100
Other Professionals	2,388	111	2,570	2,600
Postdoctorates	279	-	470	450
Graduate Students	7,320	1,650	8,645	8,800
Undergraduate Students	5,335	680	5,365	5,500
K-12 Students	12,500	500	12,470	12,500
K-12 Teachers	62,060	1,075	62,150	62,200
Total Number of People	**97,602**	**4,848**	**99,800**	**100,150**

DIVISION OF HUMAN RESOURCE DEVELOPMENT (HRD) $168,910,000
+$12,000,000 / 7.6%

HRD Funding

(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Change Over FY 2010 Estimate Percent
Total, HRD	**$154.08**	-	**$156.91**	**$168.91**	**$12.00**	**7.6%**
Undergraduate/Graduate Student Support	87.02	-	90.10	103.10	13.00	14.4%
Research and Education Infrastructure	47.59	-	47.28	47.28	-	-
Opportunities for Women and Persons with Disabilities	19.46	-	19.53	18.53	-1.00	-5.1%

Totals may not add due to rounding.

HRD implements programs and activities that enhance the quantity, quality, and diversity of human capital engaged in U.S. science, technology, engineering, and mathematics (STEM). A principal focus of HRD is to ensure access to and full participation in STEM through increased, improved, and diversified opportunities; enhanced quality in the educational experience; and hands-on research experiences. In particular, HRD plays a central role in increasing opportunities in STEM education for individuals from historically underserved populations - minorities, women and persons with disabilities - and supports the development of the educators, researchers, and institutions dedicated to serving these populations. HRD programs also build a research knowledge base about effective practices in achieving these goals.

HRD programs are funded through three budget lines: Undergraduate and Graduate Student Support; Research and Education Infrastructure; and Opportunities for Women and Persons with Disabilities. Previously, the Undergraduate and Graduate Student Support line included the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), the Louis Stokes Alliances for Minority Participation (LSAMP), and the Tribal Colleges and Universities Program (TCUP). In FY 2011, HRD will combine these graduate and undergraduate student programs into a single underrepresented group program as discussed further in the following section. The Research and Education Infrastructure line includes the Alliances for Graduate Education and the Professoriate (AGEP) and the Centers of Research Excellence in Science and Technology (CREST) program. The Opportunities for Women and Persons with Disabilities line includes ADVANCE, the Research in Disabilities Education (RDE) program, and the Research on Gender in Science and Engineering (GSE) program.

Factors Influencing the Allocation Across HRD Programs

In FY 2011, HRD will continue leadership in broadening participation in the Nation's science and engineering enterprise of all persons historically underserved and underrepresented – minorities, women, and persons with disabilities. HRD also gains insight from programs that have established records of increasing access and opportunity for learning and research for minority students pursuing STEM careers. With a FY 2011 investment of $103.10 million, HRD will implement a new consolidated program, which realigns and builds on the existing undergraduate HRD programs HBCU-UP, LSAMP, and TCUP. As authorized in Section 7033 of the America COMPETES Act, this effort will invite proposals from Hispanic-serving institutions (HSIs). Support for this program underscores HRD's mission of broadening participation and workforce development from the undergraduate level to terminal employment.

Realignment of HRD Programs

(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Change Over FY 2010 Estimate Percent
Historically Black Colleges and Universities Undergraduate Program	$31.13	-	$32.00	-	-$32.00	N/A
Louis Stokes Alliances for Minority Participation	42.50	-	44.75	-	-44.75	N/A
Tribal Colleges and Universities Program	13.39	-	13.35	-	-13.35	N/A
Comprehensive Broadening Participation of Undergraduates in STEM	-	-	-	103.10	103.10	N/A
Total, Realigned Programs	$87.02	-	$90.10	$103.10	$13.00	14.4%

Totals may not add due to rounding.

The overall objective of this new program is to engage undergraduates at historically Black colleges and universities, Tribal colleges and universities, and HSIs. It will also build capacity by drawing on research and best practices across the range of institution types represented in HRD programs. Investments in this area can lead to strong alliances and high-quality institutional efforts to broaden participation.

A comprehensive HRD undergraduate program that is enabling to all minority-serving and majority institutions focusing on minority undergraduate student STEM education will cultivate a world-class broadly inclusive science and engineering workforce. By building on and realigning existing undergraduate programs, this approach:

- Combines expertise developed previously in separate programs in order to promote opportunities to build sustainable partnerships and alliances among the historically black colleges and universities, Hispanic-serving institutions, tribal colleges and universities, and Louis Stokes Alliances for Minority Participation institutions with strong track records in producing underrepresented STEM graduates, thereby building capacity for the STEM field across a range of institutions.
- Promotes strengthening of STEM curricular offerings, enhancements in STEM faculty development, and increases in competencies and competitiveness of students at minority-serving institutions and majority institutions with strong track records in producing underrepresented STEM graduates.
- Supports transformation of the infrastructure, operations, and resources at minority-serving institutions to promote excellence in science and engineering education and research across the Nation's largest producers of underrepresented STEM graduates at the baccalaureate level.
- Increases support for and engagement in frontier scientific research and access to advanced research instrumentation for STEM faculty and students at minority-serving institutions in preparation for global competitiveness.
- Stimulates innovation and creativity from the Nation's education and research enterprise through support of effective collaborations between minority–serving and majority institutions, especially research-intensive universities with NSF Science and Technology Centers (STC), Materials Research Science and Engineering Centers (MRSEC), and Engineering Research Centers (ERC).
- Maximizes undergraduate research opportunities across the nation's minority-serving and majority institutions for students underrepresented in STEM fields.
- Facilitates expanded collaboration between scientists and educators at minority-serving institutions with those at majority institutions increasing the effectiveness of STEM education.

DIVISION OF GRADUATE EDUCATION (DGE) $185,260,000
+$3,820,000 / 2.1%

DGE Funding

(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual[1]	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Change Over FY 2010 Estimate Percent
Total, DGE	**$181.67**	**-**	**$181.44**	**$185.26**	**$3.82**	**2.1%**
Graduate Research Fellowship Program	107.00	-	102.58	107.58	5.00	4.9%
Graduate STEM Fellows in K-12 Education	49.26	-	49.00	48.18	-0.82	-1.7%
Integrative Graduate Education and Research Traineeship	25.41	-	29.86	29.50	-0.36	-1.2%

Totals may not add due to rounding.

[1] NSF carried forward $15.0 million in ARRA appropriations for the Science Masters program. Awards will be made in FY 2010.

DGE supports U.S. graduate students and innovative graduate programs that prepare tomorrow's leaders in science, technology, engineering and mathematics (STEM). DGE meets its objectives through a portfolio of three graduate education programs that vary in their designs and in the options and opportunities provided to graduate students. All three programs are funded NSF-wide and managed by DGE.

- *The Graduate Research Fellowship program*, established in early years of NSF, provides the Nation's most promising graduate students with great flexibility in selecting the university of their choice and gives them the intellectual independence to follow their research ideas unfettered by the exigencies of mode of support. With the addition of 2,000 new fellows in FY 2011, the GRF program will have an estimated 6,700 fellows. Of these, it is anticipated that an estimated 3,400 will choose to receive a stipend and cost-of-education (COE) allowance in FY 2011; fellowships provide students up to three years of support over a five year period.
- *The Graduate STEM Fellows in K-12 Education (GK-12)* program supports 875 graduate students in STEM disciplines and provides associated training that enables them to acquire additional skills that will broadly prepare them for professional and scientific careers. Through interactions with teachers and students in K-12 schools, graduate students improve their communication and teaching skills while enriching STEM education in these schools.
- *The Integrative Graduate Education and Research Traineeship (IGERT)* program, based on transformative interdisciplinary research, provides 1,500 doctoral students with a strong collaborative research foundation, innovative educational programs to help them cross disciplinary boundaries, and development of personal and professional skills to prepare them for careers of the future.

Factors Influencing the Allocation Across DGE Programs

- Funding graduate education of the future leaders in STEM is the division's top priority.
- Each of the three programs has ongoing program-level evaluations and follow-up studies of program graduates that will inform both program structure and funding.
- Because the GRF program is an Administration priority program, funding increases are requested to continue this program on its path to triple the number of new fellowships awarded by FY 2013.

DIVISION OF RESEARCH ON LEARNING IN FORMAL AND INFORMAL SETTINGS (DRL)

$247,850,000
+$5,850,000 / 2.4%

DRL Funding
(Dollars in Millions)

	FY 2009 Omnibus Actual	2009 ARRA Actual	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Change Over FY 2010 Estimate Percent
Total, DRL	**$226.68**	**-**	**$242.00**	**$247.85**	**$5.85**	**2.4%**
Discovery Research K-12	108.41	-	118.50	118.73	0.23	0.2%
Informal Science Education	65.72	-	66.00	64.40	-1.60	-2.4%
Research and Evaluation on Education in S&E	42.60	-	45.50	45.72	0.22	0.5%
Project and Program Evaluation	9.94	-	12.00	19.00	7.00	58.3%

Totals may not add due to rounding.

DRL invests in research, evaluation, and development to improve the learning and teaching of science, technology, engineering, and mathematics (STEM). DRL's core programs fund research and development from preschool to graduate school and from museums to cyberspace. DRL is concerned with STEM learners of all ages and audiences of all types, ranging from adults interested in science, to STEM teachers, to after-school program providers. The division is organized in three clusters: Lifelong Learning; Knowledge Building; and Resources, Models, and Tools. These clusters provide intellectual direction and operational coordination for the division's programs and activities.

Funding at the requested level enables DRL to position its entire portfolio to address critical challenges and emerging new opportunities in STEM education and learning. The division's investment priorities are shaped by such ongoing educational challenges as reaching *all* learners with substantive opportunities to engage in STEM, and bringing effective STEM learning innovations to scale. In addition, tomorrow's imminent challenges, such as learning in cyber environments, blurring the boundaries between formal and informal learning settings, and learning about the impact of STEM education investments through innovative evaluation techniques, are equally important to the division. DRL areas of emphasis in FY 2011 will include research and development on cyberlearning, public understanding of current key topics such as climate change and clean energy, and the preparation and professional development of providers of STEM education.

Focus on STEM program evaluation design, research, and implementation is a high priority for the division with this Budget Request. The Division will expand programmatic activity to enrich the tools, methods, and designs available for innovation in the evaluation of STEM learning programs and projects. In addition, DRL will assume a key role within EHR for building capacity and expertise in STEM education program evaluation and will be deeply engaged in collaborations with the U.S. Department of Education and other agencies in the planning and implementation of cross-agency evaluation efforts in STEM teacher professional development.

Factors Influencing the Allocation Across DRL Programs

- The increased allocation for Project and Program Evaluation (PPE) will enable the division to issue a solicitation calling for research and development work that can expand capacity in the STEM education field for engaging in innovative, cyber-oriented program evaluation. In addition, this

increase will allow enhanced efforts at capacity building, study, and piloting of performance management systems in a diverse set of STEM education programs.

- Increased resources (+$6.0 million) for two program evaluations under the government-wide evaluation initiative will also allow EHR/DRL to play a leading role in cross-agency collaborations to design and undertake STEM education program evaluation. NSF and the Department of Education's Institute of Education Science will design and conduct a rigorous study of mathematics professional development for teachers that focuses on fraction topics at grade four and possible adjacent grades. The study will address the effectiveness of such professional development and why, for whom, and under what conditions the professional development is likely to be effective. NSF will also lead a multi-agency effort to design an impact study on immersive science research experiences for teachers by funding planning and initial data collection and design activities. With increased resources for PPE, the Research and Evaluation on Education in Science and Engineering (REESE) program will scale back its investments in evaluation research and increase its focus on building a research knowledge base across the cognitive, learning, and STEM education sciences for advances in cyberlearning, interdisciplinarity, and policy.
- The Discovery Research K-12 (DR-K12) and REESE programs will coordinate closely in sharpening emphasis areas, so that the knowledge base developing through REESE-funded research supports and helps improve the research and development for resources, models, and tools in DR-K12 that anticipate the learner and learning environment of the future.
- The Informal Science Education (ISE) program will focus its portfolio in concert with recommendations in the recent National Research Council synthesis study, *Learning Science in Informal Environments: People, Places, and Pursuits*, which calls for increased emphasis on research and development to build the knowledge base about learning in informal settings. It also will heighten program focus on climate change and cyberlearning.

DIVISION OF UNDERGRADUATE EDUCATION (DUE) $289,980,000
-$2,430,000 / -0.8%

DUE Funding
(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual	FY 2010 Estimate	FY 2011 Request	Change Over FY 2010 Estimate Amount	Change Over FY 2010 Estimate Percent
Total, DUE	**$283.08**	**$85.00**	**$292.41**	**$289.98**	**-$2.43**	**-0.8%**
Curriculum, Laboratory and Instructional Development	66.13	-	63.46	$61.03	-$2.43	-3.8%
Workforce Development	100.96	-	115.73	115.73	-	-
Teacher Education	115.99	85.00	113.22	113.22	-	-
Selected Programs:						
Advanced Technological Education	*51.85*	*-*	*64.00*	*64.00*	*-*	*-*
Climate Change Education	*9.95*	*-*	*5.50*	*5.50*	*-*	*-*
Robert Noyce Teacher Scholarship Program	*55.00*	*60.00*	*55.00*	*55.00*	*-*	*-*
Math and Science Partnership	*60.99*	*25.00*	*58.22*	*58.22*	*-*	*-*

Totals may not add due to rounding.

DUE is the NSF focal point for transforming undergraduate STEM education to meet the needs of the 21st century. DUE's objectives are to strengthen the science and engineering workforce and prepare all undergraduate students for an increasingly technological global society. DUE programs emphasize innovation and ongoing improvement in curricula, teaching procedures, and laboratories, so that the next generation is continuously learning with the tools and methods of inquiry used by working professionals. Collaborations are encouraged among institutions and across sectors (higher education, industry, and K-12). So that best practices penetrate deeply into the undergraduate education community, DUE provides support for faculty development, support for new instructional materials, the reform of courses, laboratories, and curricula, and assessment of outcomes.

In addition to its core activity of improvement in undergraduate curriculum and teaching practice, DUE leads EHR's efforts in teacher education and cyberlearning. It contributes directly to the development of the scientific and technical workforce via the Advanced Technological Education (ATE) and the Federal Cyber Service: Scholarship for Service (SfS) programs. The STEM Talent Expansion Program (STEP) further contributes to the Nation's technical workforce by increasing the number of students completing STEM degrees.

Factors Influencing the Allocation Across DUE Programs

DUE's FY 2011 funding request, especially the ATE program, specifically supports the commitment to workforce development, by continuing funding at the level to which it was substantially increased in FY 2010. Support will enable the expansion of critical work with two-year colleges and increase capacity to fund clean energy-related projects.

DUE programs were historically funded through two budget lines. Included in the Curriculum, Laboratory and Instructional Development line were the Course, Curriculum, and Laboratory

Improvement program (CCLI), renamed in FY 2010 to Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES), the National STEM Education Distributed Learning (NSDL) program, and STEP. Workforce Development included ATE, SfS, the Robert Noyce Teacher Scholarship Program (NOYCE), the Excellence Awards in Science & Engineering (EASE), and beginning in FY 2009, Climate Change Education (CCE). When the Math and Science Partnership (MSP) program was transferred to DUE in FY 2008, it came as its own budget line.

DUE requests that, beginning in FY 2011, its programs be realigned to better reflect their foci, as follows:

- Re-title the budget line previously titled Math and Science Partnership as Teacher Education, and assign the NOYCE program to that line. Together MSP and NOYCE broadly address the well-documented national need to increase the pool of qualified STEM teachers in K-12;
- Move STEP from Curriculum, Laboratory, and Instructional Development to Workforce Development to better reflect its explicit goal of increasing the STEM pipeline; and
- Move CCE from Workforce Development to Curriculum, Laboratory, and Instructional Development, to better reflect that its awards will focus on instructional approaches to advancing climate change education.

All DUE programs address the Administration priority of building the STEM workforce by addressing the critical juncture between K-12 education and adult working competencies, but it is useful to manage the funds at the division level based on the nature of the approaches taken, or in the case of Teacher Education, to reflect the total commitment to this critical special workforce. The realignment requested provides a more realistic account of the focus of each program.

H-1B NONIMMIGRANT PETITIONER FEES

$100,000,000
+$0/0%

In FY 2011, H-1B Nonimmigrant Petitioner Fees are projected to be $100.0 million, equal to the FY 2010 projection.

H-1B Nonimmigrant Petitioner Fees Funding

(Dollars in Millions)

	FY 2009 Omnibus Actual	FY 2009 ARRA Actual	FY 2010 Estimate	FY 2011 Estimate	Change over FY 2010 Estimate Amount	Change over FY 2010 Estimate Percent
H-1B Nonimmigrant Petitioner Fees Funding	$89.08	-	$100.00	$100.00	-	-

Beginning in FY 1999, Title IV of the American Competitiveness and Workforce Improvement Act of 1998 (P.L. 105-277) established an H-1B Nonimmigrant Petitioner Account in the general fund of the U.S. Treasury for fees collected for each petition for alien nonimmigrant status. That law required that a prescribed percentage of funds in the account be made available to NSF for the following activities:

- **Computer Science, Engineering, and Mathematics Scholarships (CSEMS)**. The program supported grants for scholarships to academically-talented, financially needy students pursuing associate, baccalaureate, or graduate degrees in computer science, computer technology, engineering, engineering technology, or mathematics. Grantee institutions awarded scholarships of up to $2,500 per year for two years to eligible students.
- **Grants for Mathematics, Engineering, or Science Enrichment Courses.** These funds provided opportunities to students for enrollment in year-round academic enrichment courses in mathematics, engineering, or science.
- **Systemic Reform Activities.** These funds supplemented the rural systemic reform efforts administered under the former Division of Educational System Reform (ESR).

In FY 2001, Public Law 106-311 increased the funds available by increasing the petitioner fees. Also, the American Competitiveness in the 21st Century Act (P.L. 106-313) amended P.L. 105-277 and changed the way petitioner fees were to be expended.

- The CSEMS activity continued under P.L. 106-313 with a prescribed percentage of H-1B receipts. The maximum scholarship duration was four years and the annual stipend was $3,125. Funds for this scholarship program totaled 59.5 percent of the total H-1B funding for NSF.
- Private-Public Partnerships in K-12: P.L. 106-313 directed the remaining 40.5 percent of receipts toward K-12 activities involving private-public partnerships in a range of areas such as materials development, student externships, and mathematics and science teacher professional development.
- Information Technology Experiences for Students and Teachers (ITEST) developed as a partnership activity in K-12 to increase opportunities for students and teachers to learn about, experience, and use information technologies within the context of STEM, including Information Technology (IT) courses.

In FY 2005, Public Law 108-447 reauthorized H-1B funding. NSF was provided with 40 percent of the total H-1B receipts collected. Thirty percent of H-1B receipts (75 percent of the receipts that NSF receives) are to be used for the Low-income Scholarship Program. Ten percent of receipts (25 percent of the receipts that NSF receives) are designated for support of the Grants for Mathematics, Science, or Engineering Enrichment Courses.

Low-income Scholarship Program. Eligibility for the scholarships was expanded from the original fields of computer science, engineering, and mathematics to include "other technology and science programs designated by the Director." The maximum annual scholarship award amount was raised from $3,125 to $10,000. NSF may use up to 50 percent of funds "for undergraduate programs for curriculum development, professional and workforce development, and to advance technological education." Because of the changes, the program was renamed in 2006 from CSEMS to Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM).

Since its inception the low-income scholarship program has received approximately 2,906 proposals from all types of colleges and universities and has made awards for 1,015 projects. Approximately 53,000 students have received scholarships ranging from one to four years, and many new grants have yet to award all their scholarships. In addition to scholarships, projects include student support activities featuring close involvement of faculty, student mentoring, academic support, and recognition of the students. Such activities are important in recruiting and retaining students in high-technology fields through graduation and into employment. Approximately 90 awards are anticipated in FY 2011.

ITEST Grants for Mathematics, Science, or Engineering Enrichment Courses. The ITEST program invests in K-12 activities that address the current concern about shortages of STEM professionals and information technology workers in the U.S. and seeks solutions to help ensure the breadth and depth of the STEM workforce, including education programs for students and teachers that emphasize IT-intensive careers. The program supports the development, implementation, testing, and scale-up of models, as well as research studies to improve the STEM workforce and build students' capacity to participate in the STEM workforce, especially the information and communication technology (ICT) areas. The solicitation places emphasis on capturing and establishing a reliable knowledge base about the dispositions toward and knowledge about STEM workforce skills in U.S. students.

Since its inception, ITEST has received 1,325 proposals and funded over 200 projects that allow students and teachers to work closely with scientists and engineers on extended research projects, ranging from biotechnology to environmental resource management to programming and problem-solving. Projects draw on a wide mix of local resources, including universities, industry, museums, science and technology centers, and school districts in order to identify the characteristics that engage a wide range of young people in STEM, especially those not successful in traditional school settings. Through a projected $168 million federal investment, ITEST impacts an estimated 190,000 students (grades K-12), 6,800 educators, and 2,000 parents and caregivers. In FY 2009, ITEST received 222 full proposals and funded 31 awards.

H-1B Financial Activities from FY 1999 - FY 2009

(Dollars in Millions)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Receipts	**$26.61**	**$48.61**	**$88.34**	**$61.04**	**$65.34**	**$0.57**	**$83.68**	**$105.32**	**$107.36**	**$104.43**	**$88.66**
Obligations incurred:											
Computer Science, Engineering, and Mathematics Scholarships	0.26	23.16	68.37	34.69	25.30	33.91	0.54	80.95	100.04	92.40	61.22
Grants for Mathematics, Engineering or Science Enrichment Courses	-	0.20	4.22	5.83	16.27	-	-	-	-	-	-
Systemic Reform Activities	-	1.70	3.70	3.97	5.00	2.50	2.72	-	-	-	-
Private-Public Partnership in K-12[1/]	-	-	2.22	12.82	-	20.87	22.69	18.45	45.90	28.72	27.86
Total Obligations	**$0.26**	**$25.06**	**$78.51**	**$57.31**	**$46.57**	**$57.28**	**$25.95**	**$99.40**	**$145.94**	**$121.12**	**$89.08**
Unallocatted Recoveries											2.20
Unobligated Balance end of year	**$26.35**	**$49.89**	**$59.72**	**$63.45**	**$83.90**	**$29.10**	**$89.58**	**$98.19**	**$63.37**	**$50.83**	**$52.62**

Totals may not add due to rounding.

1/ P.L 106-313 directs that 15 percent of the H-1B Petitioner funds go toward K-12 activities involving private-public partnerships in a range of areas such as materials development, student externships, math and science teacher professional development, etc.

Explanation of Carryover

An amount totaling $52.62 million was carried over into FY 2010. NSF's carryover for H-1B funded programs consists of $45.06 million in S-STEM and $7.56 million in ITEST. (These amounts include $17.0 million in fourth quarter receipts received too late to be obligated by the end of the fiscal year.) All carryover funds were obligated in the first quarter of FY 2010.