DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES (EHR)

$875,610,000
+$46,610,000 / 5.6%

EHR Funding
(Dollars in Millions)

	FY 2011 Actual[1]	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate Amount	Percent
Division of Research on Learning in Formal and Informal Settings (DRL)	$322.47	$290.43	$309.51	$19.08	6.6%
Division of Undergraduate Education (DUE)	217.28	235.65	246.65	11.00	4.7%
Division of Human Resource Development (HRD)	144.71	129.63	134.63	5.00	3.9%
Division of Graduate Education (DGE)	176.58	173.29	184.82	11.53	6.7%
Total, EHR	**$861.04**	**$829.00**	**$875.61**	**$46.61**	**5.6%**

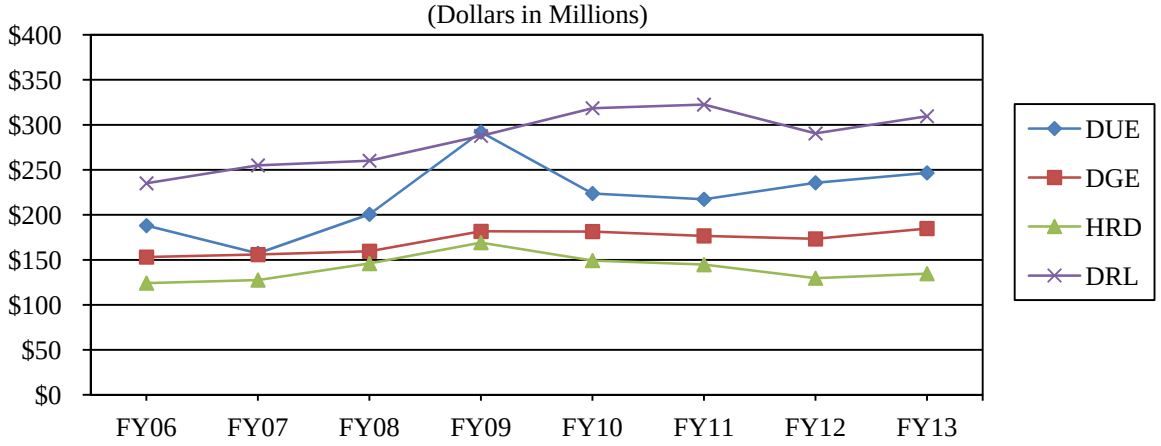
Totals may not add due to rounding.

[1] In FY 2013, Climate Change Education and Excellence Awards in Science and Engineering funding responsibilities are transferred from DUE to DGE and HRD, respectively. The Math and Science Partnership funding responsibility is transferred from DUE to DRL. Funding for all years is shown in the FY 2013 structure for comparability.

About EHR

The mission of the Directorate for Education and Human Resources (EHR) is to achieve excellence in U.S. science, technology, engineering and mathematics (STEM) education in order to support the development of a diverse and well-prepared workforce of scientists, engineers, and educators and a scientifically literate citizenry. The priorities in the FY 2013 Budget Request for EHR are driven by the critical importance to the Nation of a coherent and growing STEM education research and development Research and Development (R&D) knowledge base. This knowledge base forms the foundation required to advance strategic investment priorities – inside EHR, within OneNSF, and in partnership with other agencies – to reestablish U.S. preeminence in STEM education and STEM workforce development. NSF and EHR play a unique and crucial role in this endeavor. For more than 60 years NSF has been the lead federal agency supporting R&D innovations to improve the Nation's STEM education systems and to prepare the STEM workforce.

EHR Subactivity Funding
(Dollars in Millions)



FY 2009 funding reflects both the FY 2009 omnibus appropriation and funding provided through the American Recovery and Reinvestment Act of 2009 (P.L. 111-5).

NSF is collaborating with the White House Office of Science and Technology Policy, federal science mission agencies, and the Department of Education (ED) to address national priorities in STEM education through a coordinated STEM education investment strategy. NSF Director Subra Suresh co-chairs the National Science and Technology Council's Committee on Science, Technology, Engineering, and Mathematics Education that is developing a five-year strategic plan for federal STEM investment. EHR is centrally involved in the design and implementation of this plan, and in FY 2013 will collaborate with ED in three areas: 1) investments in the NSF Math and Science Partnership (MSP) program will be aligned with ED's Effective Teaching and Learning: STEM initiative, to build and use the evidence base for improving STEM education at the state and local level; 2) $30.0 million in EHR FY 2013 funds from the Discovery Research K-12 (DR K-12), and Transforming Undergraduate Education in STEM (TUES) programs will be directed towards a new evidence-based grant competition focused on developing, evaluating, and scaling proven practices that can help increase student learning in mathematics K-16 to be jointly administered with ED. This competition will use a tiered-evidence model similar to that used ED's Investing in Innovation program and NSF's TUES program, but will be targeted to making significant advancements in mathematics learning; 3) efforts to establish joint standards of evidence for STEM education innovations and research are underway between EHR and ED's Institute of Education Sciences (IES), to improve the evidence base for STEM education programs across government..

Appropriations 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, ~~$829,000,000~~$875,610,000, to remain available until September 30, ~~2013: Provided, That not less than $54,000,000 shall be available until expended for activities authorized by section 7030 of Public Law 110-69~~2014.

Education and Human Resources
FY 2013 Summary Statement
(Dollars in Millions)

	Enacted/ Request	Rescission	Carryover/ Recoveries	Expired	Total Resources	Obligations Incurred/Est.
FY 2011 Appropriation	$862.76	-$1.73	$0.23		$861.26	$861.04
FY 2012 Estimate	829.00		0.22		829.22	829.22
FY 2013 Request	875.61				875.61	875.61
$ Change from FY 2012 Estimate						$46.39
% Change from FY 2012 Estimate						5.6%

Totals may not add due to rounding.

Explanation of Carryover

Within the **Education and Human Resources (EHR)** appropriation, NSF carried over $221,000 (i.e., 2-year: $181,000; and no-year: $40,000) into FY 2012 for awards and contracts that were not ready for obligation in FY 2011. Obligation of these funds is expected by the second quarter of FY 2012.

Reframing EHR Investments

This Request provides a new framing of the EHR investment portfolio into three categories: Core R&D, Leadership, and Expeditions. A description of each EHR investment category follows.

Core R&D Investments. Four core areas of STEM R&D are proposed:

- STEM Learning
- STEM Learning Environments
- Broadening Participation and Institutional Capacity in STEM
- STEM Professional Workforce Preparation

These core areas were developed based on national studies and reports[1] and through consultations with the community. R&D in these core areas will continue to build the knowledge base and evidence needed to achieve excellence in STEM education and workforce development. Each EHR division will take responsibility for the intellectual definition, direction, and coherence of one core R&D area. Resources are requested to create a new $5.0 million "Core Launch Fund" in each division, to allow for a first round of grant awards that will give shape to the core R&D areas, provide synthesis of existing work, identify future needs, and highlight important trends and challenges. In FY 2013 EHR will engage in a year of dialogue with key stakeholders and communities concerned with STEM learning to seek response to the early definition of the core foci. In FY 2014 the four core R&D areas will be clarified and additional program realignment and combinations will be proposed. The divisional core R&D emphases are based on depth of staff experience within the divisions and the readiness of the respective research communities to rapidly develop strategic responses.

Leadership Investments. Leadership investments accelerate the development of the next generation of diverse and well qualified STEM researchers and educators. These include direct recognition awards, fellowships, and scholarships or grants to students, teachers, and beginning researchers.

Expedition Investments. Expeditions will be strategic investments that target opportunities through leveraging, partnering, and innovating to take on specific challenges over defined periods. Expeditions will be a key vehicle for EHR partnerships with other NSF directorates and offices and with the U.S. Department of Education (ED).

FY 2013 Summary by Division

In FY2013, three EHR programs will be assigned to divisions different from their current placement, in each case in the interest of providing appropriate balance with EHR's R&D Core, Leadership, and Expedition framework; to ensure alignment of staff expertise; and to better balance the EHR workload. The Math and Science Partnership (MSP) program (part of the STEM Learning Core) will be transferred from DUE to DRL, to center the majority of EHR's investment in K-12 STEM education in DRL and build on the report, *Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics*. The Excellence Awards in Science and Engineering (EASE) program, part of the Leadership Portfolio, will be based in the Division of Human Resource Development

[1] See for example, National Research Council. (2007) *Taking science to school: Learning and teaching science in grades K-8*. Washington, DC: The National Academies Press; and U.S. Department of Education. (2008) *Foundations for success: Final report of the National Mathematics Advisory Panel*. Washington, DC: U.S. Department of Education; The National Research Council. (2011) *Successful K-12 STEM education: Identifying effective approaches in science, technology, engineering, and mathematics. Washington, DC: The National Academies Press*; and The President's Council of Advisors on Science and Technology (2010) *Prepare and inspire: K-12 education in STEM for America's future*. Washington, DC.

(HRD) in order to ensure that broadening participation is a central focus in the awards programs. And finally, the Climate Change Education Program (CCE) will be managed in the Division of Graduate Education, and will be associated with the E^2 Sustainability.

EHR continues to define and expand its R&D core to improve STEM learning for all learners, in all settings, and at all levels. In the FY 2013 Budget Request, each division's funding includes $5.0 million for "Core Launch" to initiate activities in the division's designated Core R&D area. Explicit focus on this foundation is necessary to systematically improve the impact of NSF investments in STEM learning and workforce development and to define NSF's complementary role in R&D in the partnerships and collaborations EHR is building across NSF, and with ED, other agencies, and the private sector.

The Division of Research on Learning in Formal and Informal Settings (DRL) will continue to support the development of innovative resources, models, and tools for K-12 STEM education; fundamental research on learning; engaging experiences that support lifelong STEM learning, teacher learning, and research on national STEM priorities; and evaluation studies and activities. DRL is the NSF lead in building knowledge and evidence through research on STEM learning and will lead the Core R&D area of STEM Learning. The MSP program will be based in DRL. In addition, $15.0 million has been added to the Discovery Research K-12 (DR-K12) program in DRL to develop, validate and scale up evidence-based approaches to improve student learning at the K-12 and undergraduate levels.

The Division of Undergraduate Education (DUE) serves as the NSF focal point for transforming undergraduate STEM education to meet the needs of the 21st century. DUE will lead the Core R&D area of STEM Learning Environments, a portfolio of programs that will build and expand a coherent body of knowledge on innovative and effective STEM learning environments at all education levels. In FY 2013, the Widening Implementation and Demonstration of Evidence-based Reforms (WIDER) program will fund research and demonstration projects exploring how to achieve widespread sustainable implementation of evidence-based undergraduate instructional practices to improve student outcomes. In addition, the Transforming Undergraduate Education in STEM (TUES) program will fund a number of projects responsive to the President's Council of Advisors on Science and Technology (PCAST) draft report on strengthening early undergraduate education as well as $15.0 million to develop, validate and scale up evidence-based approaches to improve student learning at the K-12 and undergraduate levels, which is jointly funded with ED.

The Division of Human Resource Development (HRD) focuses on building a diverse and well-qualified S&E workforce through Broadening Participation. HRD investments in Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), and other minority-serving institutions, as well as institutions with strong missions to support broadening participation, remain critically important to the EHR mission. In FY 2013, HRD will lead the Core R&D area of Broadening Participation and Institutional Capacity in STEM to build a coherent body of knowledge about successful approaches and models for broadening STEM participation for all groups traditionally underrepresented in STEM, including women and persons with disabilities. This Core work also includes building the required institutional capacity to ensure that all students have access to the highest quality STEM programs and instruction. The Excellence Awards in Science and Engineering (EASE) program will move into HRD from DUE, to enable strong alignment with the broadening participation commitment.

The Division of Graduate Education (DGE) invests in U.S. graduate students and innovative graduate programs to prepare tomorrow's leaders in STEM. DGE will lead the Core R&D area of STEM Professional Workforce Development, a portfolio that will build and expand a coherent body of knowledge about successful approaches, practices, and models for STEM professional workforce preparation. The Climate Change Education (CCE) program will move into DGE from DUE, for better programmatic alignment with workforce readiness and the sustainability focus in E^2.

Major Investments

EHR Major Investments

(Dollars in Millions)

Area of Investment	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate Amount	Percent
E^2	-	-	20.50	20.50	N/A
I-Corps	0.10	-	0.30	0.30	N/A
INSPIRE	-	-	2.00	2.00	N/A
SaTC	-	45.00	25.00	-20.00	-44.4%
SEES	6.08	6.00	0.50	-5.50	-91.7%

Major investments may have funding overlap and thus should not be summed.

- Expeditions in Education (E^2): The resources committed to the OneNSF E^2 ($20.50 million) will formalize a series of partnership activities among EHR and other directorates and offices to engage, empower, and energize learners in STEM. See the E^2 narrative in the OneNSF Portfolios for further detail.

- NSF Innovation Corps (I-Corps): For FY 2013, DGE will lead EHR's participation to promote this OneNSF activity.

- Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE): The FY 2013 resources committed to INSPIRE ($2.0 million) will promote the development of STEM professionals in the INSPIRE-supported research areas led by EHR, with DRL as the lead division.

- Secure and Trustworthy Cyberspace (SaTC): The Division of Undergraduate Education (DUE) will be responsible for funding SaTC activities, totaling $25.0 million in FY 2013, through the Federal Cyber Service: Scholarships for Service/Cybercorps (SFS) program.

- Science, Engineering, and Education for Sustainability (SEES): The Division of Human Resource Development (HRD) will be responsible for funding of SEES activities totaling $500,000, through the Centers of Research Excellence in Science and Technology (CREST) program.

Program Monitoring and Assessment

The Performance chapter provides details regarding the periodic reviews of programs and portfolios of programs by external Committees of Visitors and directorate Advisory Committees.

Program Evaluation:

- EHR conducts program evaluations to assess the quality and impact of its programs. These evaluation activities are essential to the continued shaping of program and portfolio directions and emphases. EHR currently has 24 evaluation studies and activities underway. In FY 2012, findings will be available from the Math and Science Partnership program (MSP), the ADVANCE program, and the Alliances for Graduate Education and the Profession (AGEP) program.
- In FY 2012, EHR's cross-directorate evaluation group is exploring the feasibility of how best to evaluate themes that cross NSF STEM education programs. EHR anticipates initiating evaluation studies around cyberlearning, preK-5 education, Research Experiences for Undergraduate (REU)

sites, and broadening participation. In addition, two longitudinal studies will be initiated, one to examine the long-term impact of REU site experiences on student participants, and the other to study impact of Graduate Research Fellowships (GRF) on recipients. The Promoting Research and Innovation in Methodologies for Evaluation (PRIME) activity continues to fund proposals to develop new methods, measures, and tools for conducting innovative evaluations of STEM education programs**.**

- In FY 2013, EHR will systematize project-level evaluation, allowing better aggregation of data from its projects.

Committees of Visitors (COV):

- In 2012, COVs are scheduled for the following programs: Research on Education and Learning (REAL) (formerly Research and Evaluation on Education in Science and Engineering (REESE)); Discovery Research K-12 (DR-K12); Research in Disabilities Education (RDE) and Research on Gender in Science and Engineering (GSE) in DRL/HRD; Advanced Technological Education (ATE); STEM Talent Extension Program (STEP); the Robert Noyce Scholarship Program (NOYCE) in DUE; and the Graduate Research Fellowship Program (GRF) in DGE.
- In 2013, COVs will review Centers for Research Excellence in Science and Technology (CREST), AGEP; Louis Stokes Alliances for Minority Participation (LSAMP); Tribal Colleges and Universities Program (TCUP); the Historically Black Colleges and Universities Program (HBCU-UP) in HRD; and Transforming Undergraduate Education in STEM (TUES) in DUE.

Workshop on Successful STEM Schools:

- NSF funded a recent workshop convened by the National Research Council which produced a report, *Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics.* The workshop report provides information that leaders at the school, district, state, and national levels can use to make strategic decisions about improving STEM education. A summary of this workshop is available via the National Academies Press webpage at www.nap.edu\\catalog.php?record_id=13158. Several follow-up regional workshops and dissemination activities are underway, and report results are being used to inform funding plans in EHR.

Number of People Involved in EHR Activities

	FY 2011 Actual Estimate	FY 2012 Estimate	FY 2013 Estimate
Senior Researchers	6,310	6,210	6,410
Other Professionals	2,620	2,620	2,660
Postdoctorates	245	245	250
Graduate Students	8,549	8,550	8,680
Undergraduate Students	5,495	5,500	5,580
K-12 Teachers	47,586	47,600	48,310
K-12 Students	84,475	84,510	85,760
Total Number of People	**155,280**	**155,235**	**157,650**

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

$309,510,000
+$19,080,000 / 6.6 %

DRL Funding
(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate Amount	Percent
Total, DRL	**$322.47**	**$290.43**	**$309.51**	**$19.08**	**6.6%**
Core R&D Programs	**303.87**	**272.43**	**281.23**	**8.80**	**3.2%**
Core Launch: STEM Learning	-	-	5.00	5.00	N/A
Discovery Research K-12 (DR-K12)	120.00	99.23	109.90	10.67	10.8%
Advancing Informal STEM Learning (AISL)[1] [formerly Informal Science Education (ISE)]	64.21	61.40	47.82	-13.58	-22.1%
INSPIRE	-	-	2.00	2.00	N/A
Math and Science Partnership (MSP)	57.12	57.08	57.08	-	-
Research on Education and Learning (REAL)[2] [formerly Research and Evaluation on Education in Science & Engineering (REESE)]	62.53	54.72	59.43	4.71	8.6%
Research in Disabilities Education (RDE)	*[6.53]*	*[6.50]*	*[6.50]*	-	-
Research on Gender in Science and Engineering (GSE)	*[10.42]*	*[10.50]*	*[10.50]*	-	-
Expeditions	**-**	**-**	**4.33**	**4.33**	**N/A**
DR-K12/E[2]: Cyberlearning, Data, and Observations for STEM Education	-	-	4.33	4.33	N/A
Leadership Programs	**18.60**	**18.00**	**23.95**	**5.95**	**33.1%**
Project and Program Evaluation (PPE)	18.60	18.00	23.95	5.95	33.1%

Totals may not add due to rounding.

[1] EHR proposes renaming Informal Science Education (ISE) beginning in FY 2013.

[2] EHR proposes renaming Research and Evaluation on Education in Science & Engineering (REESE) beginning in FY 2013.

The Division of Research on Learning in Formal and Informal Settings (DRL) will lead the Core R&D area of STEM Learning**,** where investments from several DRL-based programs (DR-K12, AISL (formerly ISE), MSP, and REAL (formerly REESE) will be treated as a portfolio that contributes to a coherent body of knowledge and evidence about STEM learning. This foundation will be part of the basis for innovations in STEM education and learning environments, for broadening participation, for workforce development, and for partnerships with other directorates and offices as they invest in discipline-based approaches to STEM education. While DRL-funded research is likely to be situated in physical and social settings, and may involve development of learning resources and tools, the principal goal is to characterize the STEM learning process in all its forms, by the full range of learners, in a full range of settings. This includes development of innovative and effective approaches and instruments for promoting and assessing learning. A particular focus is on understanding how to improve STEM learning and education opportunities for all learners, including those from groups traditionally underrepresented in STEM, especially women, minorities, persons with disabilities, English language learners, and veterans.

Within this Core R&D area, DRL will collaborate across the directorate in FY 2013 to emphasize:

- understanding STEM learning in the context of emerging cyberinfrastructure, which is transforming STEM practices, STEM learning, and assessment;
- understanding learning by underrepresented STEM learners, including women and persons with disabilities;
- understanding STEM learning across settings, including homes, formal institutions, informal institutions, and mobile or cross-setting forms;
- advancing assessment of STEM learning using a variety of approaches and resources, especially with the advent of common core state standards in K-12 education; and
- understanding STEM learning at the undergraduate level, by building on the knowledge base generated by the REAL program (formerly REESE), the TUES program, the WIDER program, a forthcoming National Academies report on discipline-based education research, the PCAST report on undergraduate education, and numerous activities underway within and outside of NSF, including funded synthesis projects, workshops, and seminars.

FY 2013 Summary

All funding decreases/increases represent change over the FY 2012 Estimate.

Core R&D Programs

- Core Launch, initiated at $5.0 million in FY 2013, will provide grant awards to document what is known about STEM learning to date and develop plans for coordination and synthesis among STEM learning programs.
- DR-K12 (+$10.67 million to a total of $109.90 million) funds awards that focus on R&D models and tools for K-12 education projects. Additionally, in conjunction with TUES in DUE, DR-K12 invests $15.0 million to develop, validate and scale up evidence-based approaches to improve student learning at the K-12 and undergraduate levels, which will be jointly administered by NSF and ED.
- AISL (formerly ISE) (-$13.58 million to a total of $47.82 million) will support fewer awards, focusing on the research and model-building contributions of the program to better understand effective means and innovative models for engaging today's young people and adults in science outside of school settings. Additionally, this reduction helps support the Core Launch area, which will include an emphasis on learning outside of school.
- INSPIRE (+$2.0 million), an OneNSF activity, EHR's leadership to come from DRL.
- MSP remains at the FY 2012 Estimate.
- REAL (formerly REESE) (+$4.71 million to a total of $59.43 million) will support awards that focus on EHR's CORE R&D as described above.

Expeditions

- E^2: Cyberlearning, Data, and Observations for STEM Education (+$4.33 million), an OneNSF activity, will be coordinated by DRL in partnership with other directorates and offices. It will build on the current Cyberlearning Transforming Education (CTE) activity as well as other EHR investments in cyberlearning.

  An external expedition project with ED will be initiated in FY 2013 building on the partnership model developed between ED and NSF's MSP programs. The expedition will explore ways to improve STEM-based initiatives within states, regions, or districts based on the lessons learned in NSF's MSP program, with a focus on mathematics in a tiered-evidence approach. This activity will be based in DRL, with funding in the DRK-12 program.

Leadership Programs

- PPE (+$5.95 million to a total of $23.95 million) will be managed by DRL on behalf of all of EHR. The focus in FY 2013, with increased resources, will be on common metrics across workforce and undergraduate programs, monitoring systems to better shape leadership investments over time, and assessment of instruction and outcomes in undergraduate education.

DIVISION OF UNDERGRADUATE EDUCATION (DUE) $246,650,000
+$11,000,000 / 4.7 %

DUE Funding
(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate Amount	Percent
Total, DUE	**$217.28**	**$235.65**	**$246.65**	**$11.00**	**4.7%**
Core R&D Programs	**147.59**	**127.76**	**146.76**	**19.00**	**14.9%**
Core Launch: STEM Learning Environments	-	-	5.00	5.00	N/A
Advanced Technological Education (ATE)	64.35	64.00	64.00	-	-
STEM Talent Extension Program (STEP)	32.23	24.30	16.30	-8.00	-32.9%
National STEM Education Distributed Learning (NSDL)	9.75	-	-	-	N/A
Transforming Undergraduate Education in STEM (TUES)	41.25	39.46	61.46	22.00	55.8%
Expeditions	**-**	**8.00**	**20.00**	**12.00**	**150.0%**
Widening Implementation and Demonstration of Evidenced-based Reforms (WIDER)/E^2: Transforming Undergraduate STEM Learning	-	8.00	20.00	12.00	150.0%
Leadership Programs	**69.69**	**99.89**	**79.89**	**-20.00**	**-20.0%**
Robert Noyce Scholarship Program (NOYCE)	54.90	54.89	54.89	-	-
Federal Cyber Service: Scholarship for Service/Cybercorps (SFS)	14.79	45.00	25.00	-20.00	-44.4%

Totals may not add due to rounding.

The Division of Undergraduate Education (DUE) will lead the Core R&D area of STEM Learning Environments, where investments from several DUE programs (ATE, STEP, and TUES) will be developed as a portfolio to anchor a coherent body of knowledge on innovative and effective STEM learning environments. This Core R&D area will eventually encompass all levels, including such critical transitions as the high school to undergraduate or community college to four-year institution shifts, and will address the anytime, anywhere nature of education and learning today. Investments will support research about the design, implementation, scale-up, dissemination, and institutionalization of STEM instructional practices, tools, models, and materials that can bring learners to the frontiers of science.

While the TUES program is the intellectual base of DUE's Core R&D, the STEM Talent Expansion Program (STEP) has a complementary portfolio in the development, study, and broad implementation of best practices in the recruitment and retention of students in STEM disciplines. Particular R&D emphases within DUE's core in FY 2013 will be:

- designing STEM learning environments and tools aimed at increasing and tapping the diversity of the STEM workforce for broadening participation;
- assessing the nature and impact of evidence-based undergraduate STEM instructional practices;
- understanding how successful, evidence-based instructional practices can be broadly diffused and adopted/adapted;
- building innovative curricular, pedagogical, and technological approaches to disciplinary and interdisciplinary STEM learning; and preparing tomorrow's STEM leaders; and

- using scientific content and emphases in STEM learning environments to reflect the changing nature and practice of science, particularly data-driven and computationally enabled science, as a way to engage, retain, and prepare STEM learners.

Beginning in FY 2013, EHR proposes to move three programs from DUE to other EHR divisions, to enable better alignment and investment synergies. Refer to the table EHR Realignment of Programs Between Divisions on page 17 for a complete list of changes. These are:

- The MSP program moves into DRL.
- CCE program moves into DGE.
- The Excellence Awards in Science and Engineering (EASE) program moves into the Division of Human Resources (HRD).

FY 2013 Summary

All funding decreases/increases represent change over the FY 2012 Estimate.

Core R&D Programs

- Core Launch, initiated at $5.0 million in FY 2013, will provide grant awards to document what is known about STEM learning environments to date and develop plans for coordination and synthesis among STEM learning environment R&D programs in the directorate.
- ATE remains at the FY 2012 Estimate at $64.0 million.
- STEP (-$8.0 million to a total of $16.30 million) is decreased in part to support the Core Launch activities, which will include focus on institutional change in STEM education.
- TUES (+$22.0 million to a total of $61.46 million) will invest in the undergraduate component of the joint mathematics tiered evidence program with the Department of Education as well as some of the specific recommendations related to evidence-based instruction proposed in the PCAST report on undergraduate education. Additionally, in conjunction with DR-K12 in DRL, TUES invests $15.0 million to develop, validate and scale up evidence-based approaches to improve student learning at the K-12 and undergraduate levels, which will be jointly administered by NSF and ED.

Expeditions

- WIDER (+$12.0 million to a total of $20.0 million) invests in institutional change in colleges and universities to bring evidence-based instructional practices to scale.
- E^2: Transforming Undergraduate STEM Learning: DUE will coordinate the OneNSF Expeditions in Education (E^2) activity in partnership with a number of the other directorates and offices. We anticipate this activity will advance undergraduate learning across disciplinary boundaries, take advantage of the available assets in NSF-funded science facilities and centers, and expand research on undergraduate STEM instructional practice and impact. This activity will be closely connected to the NSF-wide Priority Goal for undergraduate education. See the Performance Information chapter for specific information.

Leadership Programs

- NOYCE remains at the FY 2012 Estimate.
- SFS (-$20.0 million to a total of $25.0 million) is decreased below FY 2012 but increased $10.21 million over FY 2011. This program is EHR's principal contribution to the Secure and Trustworthy Cyberspace (SaTC) OneNSF initiative.

DIVISION OF HUMAN RESOURCE DEVELOPMENT (HRD) $134,630,000 +$5,000,000 / 3.9%

HRD Funding

(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate Amount	Percent
Total, HRD	**$144.71**	**$129.63**	**$134.63**	**$5.00**	**3.9%**
Core R&D Programs	**139.53**	**124.48**	**129.48**	**5.00**	**4.0%**
Core Launch: Broadening Participation and Institutional Capacity in STEM	-	-	5.00	5.00	N/A
ADVANCE	1.52	1.53	1.53	-	-
Alliances for Graduate Education and the Profession (AGEP)[1]	16.69	7.84	7.84	-	-
Historically Black Colleges and Universities Program (HBCU-UP)	31.93	31.94	31.94	-	-
Louis Stokes Alliances for Minority Participation (LSAMP)	45.63	45.62	45.62	-	-
Tribal Colleges & Universities Program (TCUP)	13.33	13.31	13.31	-	-
Centers for Research Excellence in Science and Technology (CREST)	30.43	24.24	24.24	-	-
Leadership Programs	**5.18**	**5.15**	**5.15**	**-**	-
Excellence Awards in Science and Engineering (EASE)	5.18	5.15	5.15	-	-

Totals may not add due to rounding.

[1] Alliances for Graduate Education and the Professoriate has been changed to Alliances for Graduate Education and the Profession.

The Division of Human Resource Development (HRD) aims to grow the U.S. science, technology, engineering and mathematics (STEM) workforce by supporting the broader participation and success of individuals currently underrepresented in STEM, building the capacity of the institutions that serve them, and conducting research on effective mechanisms and models for achieving both of these goals. HRD takes the NSF-wide lead in advancing understanding of issues specific to participation of underrepresented minorities in STEM fields, including women and persons with disabilities, and of institutional capacity.

HRD will lead the Core R&D area of Broadening Participation and Institutional Capacity in STEM, where investments from several HRD programs (ADVANCE, AGEP, HBCU-UP, LSAMP and TCUP). The division is committed to knowledge building and application, including investing in the creation of new knowledge, innovations, and models for broadening participation in the STEM enterprise and translating these for use by stakeholders**.** The expansion of stakeholder institutional capacity to support and engage diverse populations in high-quality STEM education and research programs is critical and will be advanced through this Core R&D. Emphases will include:

- institutional capacity building models and strategies;
- research to examine the particular STEM student and institutional capacity needs in Hispanic-serving institutions;
- examination of model practices and their relationships to particular institution types; and

- the role of community colleges in attracting and retaining underrepresented minority students, women, and persons with disabilities in STEM.

FY 2013 Summary

All funding decreases/increases represent change over the FY 2012 Estimate.

Core R&D Programs

- Core Launch, initiated at $5.0 million, in FY 2013, will provide grant awards to document what is known about building and expanding a coherent body of knowledge about successful approaches and models for broadening STEM participation and building institutional capacity.
- CREST will remain at the FY 2012 Estimate. Funding will allow for both continuing and new awards that support the transformation of institutional academic and research infrastructure to expand opportunities for underrepresented groups in STEM disciplines at the graduate, post-doctorate, and professoriate levels.

Leadership Programs

- EASE will remain at the FY 2012 Estimate. In FY 2013, HRD will assume full leadership from the Division of Undergraduate Education (DUE) for EASE. This program will be the signature Leadership program of HRD to promote broader participation and success in Presidential awards programs.

DIVISION OF GRADUATE EDUCATION (DGE) $184,820,000
+$11,530,000 / 6.7%

DGE Funding
(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate Amount	Percent
Total, DGE	**$176.58**	**$173.29**	**$184.82**	**$11.53**	**6.7%**
Core R&D Programs	**29.70**	**31.20**	**28.16**	**-3.04**	**-9.7%**
Core Launch: STEM Professional Workforce Preparation	-	-	5.00	5.00	N/A
Integrative Graduate Education and Research Traineeship Program (IGERT)	29.60	31.20	22.86	-8.34	-26.7%
I-Corps	0.10	-	0.30	0.30	N/A
Expeditions	**5.43**	**5.50**	**8.17**	**2.67**	**48.5%**
Integrative Graduate Education and Research Traineeship Program (IGERT)/ E^2: Learning and Understanding Sustainability	-	-	3.41	3.41	N/A
Climate Change Education (CCE)/E^2: Learning and Understanding Sustainability	5.43	5.50	4.76	-0.74	-13.5%
Leadership Programs	**141.44**	**136.59**	**148.49**	**11.90**	**8.7%**
Graduate STEM Fellows in K-12 Education (GK-12)	48.18	26.95	27.00	0.05	0.2%
Graduate Research Fellowship (GRF)	93.27	109.64	121.49	11.85	10.8%

Totals may not add due to rounding.

The Division of Graduate Education (DGE) supports U.S. graduate students and innovative graduate programs to prepare tomorrow's leaders in science, technology, engineering, and mathematics (STEM). DGE will lead the Core R&D area of STEM Professional Workforce Preparation, where investment from the DGE-based IGERT program will serve as the foundation. The focus of this core extends beyond the graduate level and includes the development of a range of STEM professionals, such as technicians, STEM teachers, undergraduate-level entrants to the STEM workforce, and others. This body of R&D will be treated as a portfolio that supports implementation of successful approaches, practices, and models for STEM professional workforce preparation. The FY 2013 emphases will include:

- program and project evaluation to determine the impacts of innovative and varied approaches to graduate education developed through NSF support (including research assistantships, traineeships, fellowships, etc.);
- strategies for monitoring and tracking NSF's investments in human capital and workforce preparation; and
- preparation of a STEM professional workforce prepared to lead in data-intensive, cyber-enabled science, and in interdisciplinary science.

DGE will support the development of curricular, experiential, and instructional models at the graduate level to prepare members of the S&E workforce to be innovators. The following are potential activities that will increase integration with other directorates and offices, and other divisions within EHR.

Research and Curriculum Development

- Because of its size, the DGE portfolio, consisting of a traineeship and a fellowship program, is limited in its potential impact on innovation in graduate education as a whole. However, in FY 2012, DGE is working with other EHR divisions to provide support for research in graduate education, curriculum development, and other activities to promote improvements in S&E graduate education.

Increase NSF Impact in Graduate Education

- In partnership with other groups in EHR and across NSF, DGE will initiate efforts to evaluate current mechanisms for supporting graduate students (for example, RAs, fellowships, traineeships, centers, research training groups) with the goal of developing a comprehensive strategy to increase the impact of NSF's support for graduate students and graduate education.

Leverage NSF Support of Graduate Students

- In FY 2013, DGE will develop a pilot effort that leverages existing NSF support of graduate students (RAs, GRF Fellows, Trainees, etc.) at an institution to help ensure these students benefit from effective practices in graduate education. In FY 2012, GRF is initiating and conducting a phase-one evaluation framing study. In FY 2013, a GRF full-scale longitudinal study will be initiated.

FY 2013 Summary

All funding decreases/increases represent change over the FY 2012 Estimate.

Core R&D Programs

- Core Launch, initiated at $5.0 million in FY 2013, will provide grant awards to document what is known about STEM Professional Workforce Preparation and develop plans for coordination and synthesis among NSF STEM workforce development programs., The workforce preparation focus, extends beyond the graduate level and includes the development of a range of STEM professionals, such as technicians, STEM teachers, and undergraduate-level entrants to the STEM workforce.
- IGERT (-$4.93 million to a total of $26.27 million) will decrease the number/amount of awards to support comprehensive Ph.D. programs that are innovative models for interdisciplinary education and research and that prepare students for academic and non-academic careers. Additionally, this decrease supports the DGE Core Launch on STEM Professional Workforce Preparation. EHR's contribution to the IGERT program also will support the Learning and Understanding Sustainability focus area of the E^2 activity.
- I-Corps ($300,000 in FY 2013) will promote the development of STEM professionals in the I-Corps-supported research areas.

Expeditions

- EHR's involvement in the E^2 activity on Learning and Understanding Sustainability (+$3.41 million) will be led through the IGERT program.
- CCE (-$740,000 to a total of $4.76 million) will be transferred from the DUE to DGE and will contribute to E^2 Learning and Understanding Sustainability activities.

Leadership Program

- GRF (+$11.85 million to a total of $121.49 million) continues as NSF's signature graduate research fellowship program, led by DGE. The requested amount will allow for the addition of 2,000 new fellows in FY2013 and support a stipend increase from $30,000 to $32,000. The remainder of funding for the GRF program is shown in the Integrative Activities budget line within the R&RA account.
- GK-12 (+$50,000 to a total of $27.0 million) is increased slightly to support continuing grant increments. This aligns with the approved plan for termination of the program. FY 2013 funding will provide final support for an estimated 800 GK-12 graduate fellows.

EHR Realignment of Programs Between Divisions

(Dollars in Millions)

FY 2012 Structure	FY 2013 Request	FY 2013 Structue	FY 2013 Request
Undergraduate Education	**$308.64**	**Undergraduate Education**	**$246.65**
Climate Change Education	4.76	Core Launch:STEM Learning Environments	5.00
Transforming Undergraduate Education in STEM (TUES)	61.46	Transforming Undergraduate Education in STEM (TUES)	61.46
National STEM Education Distributed Learning (NSDL)	-	National STEM Education Distributed Learning (NSDL)	-
Advanced Technological Education (ATE)	64.00	Advanced Technological Education (ATE)	64.00
STEM Talent Expansion Program (STEP)	16.30	STEM Talent Expansion Program (STEP)	16.30
Widening Implementation and Demonstration of Evidence-based Reforms (WIDER)	20.00	Widening Implementation and Demonstration of Evidence-based Reforms (WIDER)	20.00
Robert Noyce Scholarship Program (NOYCE)	54.89	Robert Noyce Scholarship Program (NOYCE)	54.89
Federal Cyber Service: Scholarship for Service/Cybercorps (SFS)	25.00	Federal Cyber Service: Scholarship for Service/Cybercorps (SFS)	25.00
Excellence Awards in Science and Engineering (EASE)	5.15		
Math and Science Partnership (MSP)	57.08		
Graduate Education	**$174.76**	**Graduate Education**	**$184.82**
		Core Launch: STEM Professional	5.00
		NSF Innovation Corps (I-Corps)	0.30
Graduate Research Fellowship (GRF)	121.49	Graduate Research Fellowship (GRF)	121.49
Graduate STEM Fellows in K-12 Education (GK-12)	27.00	Graduate STEM Fellows in K-12 Education (GK-12)	27.00
Integrative Graduate Education and Research Traineeship (IGERT)	26.27	Integrative Graduate Education and Research Traineeship (IGERT)	26.27
		Climate Change Education (CCE)	4.76
Human Resource Development	**$124.48**	**Human Resource Development**	**$134.63**
		Core Launch: Broadening Participation and Institutional Capacity in STEM	5.00
Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)	31.94	Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)	31.94
Louis Stokes Alliances for Minority Participation (LSAMP)	45.62	Louis Stokes Alliances for Minority Participation (LSAMP)	45.62
Tribal Colleges and Universities Program (TCUP)	13.31	Tribal Colleges & Universities Program (TCUP)	13.31
Alliances for Graduate Education and the Profession (AGEP)	7.84	Alliances for Graduate Education and the Profession (AGEP)	7.84
Centers of Research Excellence in Science and Technology (CREST)	24.24	Centers for Research Excellence in Science and Technology (CREST)	24.24
ADVANCE	1.53	ADVANCE	1.53
		Excellence Awards in Science and Engineering (EASE)	5.15
Research on Learning in Formal and Informal Settings	**$245.43**	**Research on Learning in Formal and Informal Settings**	**$309.51**
		Core Launch: STEM Learning	5.00
		INSPIRE	2.00
Discovery Research K-12 (DR-K12)	114.23	Discovery Research K-12 (DR-K12)	114.23
Advancing Informal STEM Learning (AISL) [formerly Informal Science Education (ISE)]	47.82	Advancing Informal STEM Learning (AISL) [formerly Informal Science Education (ISE)]	47.82
Project and Program Evaluation (PPE)	23.95	Project and Program Evaluation (PPE)	23.95
Research on Education and Learning (REAL) [formerly Research and Evaluation on Education in Science & Engineering (REESE)/ Research on Gender in Science and Engineering (GSE)/Research in Disabilities Education (RDE)]	59.43	Research on Education and Learning (REAL) [formerly Research and Evaluation on Education in Science & Engineering (REESE)/ Research on Gender in Science and Engineering (GSE)/Research in Disabilities Education (RDE)]	59.43
		Math and Science Partnership (MSP)	57.08
Core Launch	20.00		
INSPIRE	2.00		
I-Corps	0.30		
TOTAL, EHR	**$875.61**	**TOTAL, EHR**	**$875.61**

Totals may not add due to rounding.

Totals may not add due to rounding.

H-1B NONIMMIGRANT PETITIONER FEES

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

In FY 2013, H-1B Nonimmigrant Petitioner Fees are projected to be $100.0 million, equal to the FY 2012 projection.

H-1B Nonimmigrant Petitioner Fees Funding

(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Estimate	Change over FY 2012 Estimate Amount	Change over FY 2012 Estimate Percent
H-1B Nonimmigrant Petitioner Fees Funding	$96.30	$100.00	$100.00	-	-

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, which has now been renamed Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM). 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, through Information Technology Experiences for Students and Teachers (ITEST).

- **Low-income Scholarship Program: S-STEM.** Eligibility for the scholarships was expanded in 2006 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 5,000 proposals from all types of colleges and universities and has made awards for 1,195 projects. Approximately 63,800 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, curriculum development, and recognition of the students. Such activities are important in recruiting and retaining students in high-technology fields through graduation and into employment. S-STEM projects report much higher retention and graduation rates among scholarship students than among other STEM majors. Approximately 90 awards are anticipated in FY 2013, with an emphasis on increasing involvement of community colleges.

- **Mathematics, Science, or Engineering Enrichment Courses: ITEST**. 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. ITEST funds activities for students and teachers that emphasize mathematics, science, and engineering careers, and emphasizes the importance of evaluation and research to understand the impact of such activities. The program supports the development, implementation, testing, and scale-up of models, STEM robotic projects, and research studies to improve the STEM workforce and build student's capacity to participate in the STEM workforce.

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, the ITEST program has received 1,949 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 $191 million federal investment, ITEST impacts an estimated 216,000 students (grades K-12), 7,700 educators, and 2,300 parents and caregivers. In FY 2011, ITEST received 408 full proposals and funded 15 awards.

H-1B Financial Activities from FY 2000 - FY 2011

(Dollars in Millions)

	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Receipts	**$88.34**	**$61.04**	**$65.34**	**$0.57**	**$83.68**	**$105.32**	**$107.36**	**$104.43**	**$88.66**	**$91.22**	**$106.11**
Unobligated Balance start of year	**$48.89**	**$59.72**	**$63.45**	**$83.90**	**$29.10**	**$89.58**	**$98.19**	**$63.37**	**$50.83**	**$52.62**	**$50.15**
Obligations incurred:											
Computer Science, Engineering, and Mathematics Scholarships	68.37	34.69	25.30	33.91	0.54	80.95	100.04	92.40	61.22	75.96	77.67
Grants for Mathematics, Engineering or Science Enrichment Courses	4.22	5.83	16.27	-	-	-	-	-	-		-
Systemic Reform Activities	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	20.85	18.62
Total Obligations	**$78.51**	**$57.31**	**$46.57**	**$57.28**	**$25.95**	**$99.40**	**$145.94**	**$121.12**	**$89.08**	**$96.81**	**$96.29**
Unallocated Recoveries									2.20	3.12	0.96
Unobligated Balance end of year	**$59.72**	**$63.45**	**$83.90**	**$29.10**	**$89.58**	**$98.19**	**$63.37**	**$50.83**	**$52.62**	**$50.15**	**$60.93**

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.

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 EHR 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.
- The Information Technology Experiences for Students and Teachers (ITEST) program was 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.

Explanation of Carryover

Within the H-1B Nonimmigrant Petitioner account (Mandatory), $60.93 million was carried over into FY 2012, which consisted of $17.41 million in ITEST and $43.52 million in S-STEM and includes third quarter H-1B receipts (received in July 2011) and $32.5 million in fourth quarter receipts (received in October 2011). Since NSF receives the largest quarterly payment of H-1B visa fees in July, there is insufficient time to obligate the receipts on awards before the end of the fiscal year. These resources will allow for both I-TEST and S-STEM to support awards in the third quarter of FY 2012.