To MICHELLE

Date March 11 92 Time 9:35a

WHILE YOU WERE OUT

M Randy Beales

of

Phone 401 1095

Area Code Number Extension

TELEPHONED		PLEASE CALL	
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Message

DE

Operator

AMPAD EFFICIENCY® 23-021 CARBONLESS

Correct # ~~#~~ 357-7023

To Michelle

Date 10 Mar Time 12:51

WHILE YOU WERE OUT

M C. Kerry Jones

of Nat'l Science Found

Phone 357-9527.

Area Code Number Extension

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Message

~~or~~ Malcolm Long.

Fay

Operator

AMPAD EFFICIENCY® 23-021 CARBONLESS

Carrie Call

Jones

NSF

357 7287

-DAC

To Nichelle

Date 11 Mar Time 5:27

WHILE YOU WERE OUT

M Randy Beales

of

Phone 401-1095

Area Code Number Extension

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Message

Jay

Operator

AMPAD EFFICIENCY® 23-021 CARBONLESS

To SMNixon

Date 3-10 Time 7:15pm

WHILE YOU WERE OUT

M Randy Beales

of

Phone 401-1095

Area Code Number Extension

TELEPHONED	X	PLEASE CALL	
CALLED TO SEE YOU		WILL CALL AGAIN	
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Message

CBR

Operator

AMPAD EFFICIENCY® 23-021 CARBONLESS

Fact Check Copy

(Hinchliffe/Nix)
March 11, 1992 10 a.m.
AWARDS Draft Two

PRESIDENTIAL REMARKS: AWARDS FOR EXCELLENCE IN SCIENCE AND MATH
ROSE GARDEN
THURSDAY, MARCH 12, 1992 2:30 P.M.

Lisa Colewell OSTP x7116

Thank you, and welcome to the Rose Garden. I'm glad my previous meeting didn't run late, or I would have had to bring a note from Barbara. \\ It's great to see you here -- Secretary Martin, Dr. Massey, Dr. Wong -- and, most of all, let me welcome the 108 very special men and women chosen from over ~~1/4~~ one quarter of a million ~~eligible~~ secondary math and science teachers. ~~I'm proud to present you with this~~ Congratulations for receiving nation's highest honor for math and science teachers.

Lisa Colewell

Lisa Colewell x7116

[As teachers, you know first-hand what the spirit of innovation has brought to this country: though times have changed. Some say that if Edison were to invent the light bulb today, we'd have studies citing the dangers of electricity. And the newspapers would headline the story "Candle Industry Threatened."\\\]

Pres. Docs Used once before on Feb 15, 1991 Ass't Advancement of Science

You have shown the kind of excellence that will help this country meet the ambitious goals we've set for ourselves and for our nation in our America 2000 education strategy -- goals worthy of the talent you have, and of the potential of our kids. We know we've got to be competitive in math and science in a changing world. That's why we've called on our kids to be #1 in the world in these subjects by the turn of the century. It's teachers like you who will help us reach our goal.

America 2000 Randy Beattie

As you know, we've set world-class standards for national assessment in five core areas -- including math and science -- and we've set a deadline for the first phase of this American

Delete per National Academy of Sciences

Achievement Test: the start of the 1993-94 school year. Many math teachers have already developed world-class curriculum standards -- and last fall, the Department of Education granted $1/2 million to the National Academy of Sciences to do the same in science.

202-334-2000

NOTES Speech Oct. 4, 1991 Pres. Elementary Awards

We're committed to these goals. All told, we've requested more than $2 billion in Federal spending on math and science education for next year's budget -- $768 million of that for pre-college, an increase of 132% in the last three years.

Randy Beales DOE 401-1095

But I believe that the single most important thing we in the Federal Government can do is to help you do your jobs. For instance, also in next year's budget, I proposed an expanded program of training so that every math and science teacher in the nation will receive in-depth, up-to-date training, in part using federal laboratories and federal personnel. This will create a world-class corps of teachers.

Steve Olson x7116 OSTP

We also want to bring new technology into the classroom, so kids can interact with astronauts, explorers and scientists; so rural schools can have access to state-of-the-art resources; and so all American kids can be exposed to the cutting-edge technologies and ideas that will shape their future.

The Federal Government can do a lot -- but we cannot do it all. Real excellence demands commitment from all of us as we work to create a new generation of American schools. We will reinvent the American school community by community, neighborhood by neighborhood, across this country. You're showing us the way. You're showing how we can break the mold -- and see what works.

You're here today because you're not afraid to reach for excellence -- and that's why I salute you all.

I salute winners like Julie Csongor [CHUN-ger], of Philadelphia, who fled the persecution of her native Hungary ~~and~~ When she came here, unable to speak English. Now she gives of herself to a generation of American kids, and says: "I have my cake in my classroom everyday. The award is my icing."

National Science Foundation
She
Madeleine Long
357-7073

NSF
Kerrie Jones
357-7073

I salute you teachers, of whom ~~former~~ students say comments like these: "Readily available to her students, she challenged us to 'risk living' by reaching beyond the expected and striving for something more. We learned that our education only began when we left her classroom."

I salute you; and I envy you. You share in our kids' sheer joy of learning, of making something work, of understanding the world. And the scientist or engineer who will one day discover the cure for cancer, or who will use technology to push back the frontiers of space or wipe out hunger: today that man or woman is a kid somewhere out there, maybe in your classroom. A kid who will catch a spark from you: a spark that will change his life, and his world's. That's your gift: a teacher affects eternity.

I'm proud to meet you because your vision of education is impressive -- and you propose some creative and innovative solutions. That's what we're searching for with every issue we face -- the experience and ideas of the people who live with these problems day in and day out.

But, mostly, I'm proud to meet you because you demonstrate

what it will take to make our students the best in the world. You encourage students by giving them direct hands-on experience. You foster curiosity and generate excitement not just in your kids, but also in their parents and in your colleagues. You still have the joy of discovery, the excitement of optimism -- you still ask questions, and try new ways. Above all, you believe in your kids -- and in the future of this nation. That's the spirit we all need.

We all know the real rewards of teaching aren't the certificates you'll receive today -- but are something much more important, as Sir Thomas More described in the play "A Man For All Seasons." At one point, he suggests to a young man that he would make a fine teacher. "And if I was," the boy asks, "well, who would know about it?" And Sir Thomas replies: "You, your pupils, your friends, God -- not a bad public, that."

Robert Bolt's "A Man For All Seasons"

Ladies and gentlemen, on behalf of your grateful nation, thank you, keep up the good work, and may God Bless you all.

# # # # #

(Hinchliffe/Nix)
March 11, 1992 3 p.m.
AWARDS Draft Three

PRESIDENTIAL REMARKS: AWARDS FOR EXCELLENCE IN SCIENCE AND MATH
ROSE GARDEN
THURSDAY, MARCH 12, 1992 2:30 P.M.

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Liza Colewell

It's great to see you here -- Secretary Martin, Dr. Massey, Dr. Wong -- and, most of all, let me welcome the 108 very special men and women chosen from over one-quarter of a million secondary teachers in their fields. **Congratulations on receiving this nation's highest honor for math and science teachers**. \\\

Used once Feb 15, 1991 Pg 173 Pres Docs

As teachers, you know first-hand what the spirit of innovation has brought to this country -- though we're not always ready for change. Sometimes I think that if Edison were to invent the light bulb today, newspapers would headline the story "Candle Industry Threatened." \\\

You have shown the kind of excellence that will help this country meet the ambitious goals we've set for our nation in our America 2000 education strategy -- goals worthy of the talent you have, and of the potential of our kids. We know we've got to be competitive in math and science in a changing world. **Our economic health -- our economic survival -- depend on how we educate ourselves to face the challenges of the next century**.

We've called on our kids to be #1 in the world in your subjects by the turn of the century -- and it's teachers like you who will help us reach our goal and will help America to excel.\\

As you know, we're helping to develop world-class standards for national assessment in five core areas -- including math and science -- and we've set a deadline for the first phase of the American Achievement Test: the start of the 1993-94 school year.

All told, we've requested more than $2 billion in Federal spending on math and science education for next year's budget -- and, if my math is correct -- and with this crowd it had better be -- $768 million of that is for pre-college -- that's **an increase of ~~132%~~ 1232% in the last three years**. \\

But I believe that the single most important thing we in the Federal Government can do is to help you do your jobs. For instance, also in next year's budget, I proposed an expanded program of federally assisted training for math and science teachers, in part using federal laboratories and federal personnel. **Innovations like this will help us create a world-class corps of teachers**.

We also want to bring new technology into the classroom, so kids can interact with astronauts, explorers and scientists -- so rural schools can have access to state-of-the-art resources -- and so all American kids can be exposed to the cutting-edge technologies and ideas that will shape their future.

The Federal Government can do a lot -- but we cannot do it all. **Real excellence demands commitment from everyone in every community as we work to create a new generation of American schools**. Together, **we will reinvent the American school** community by community, neighborhood by neighborhood, across this

country. You're showing us the way. You're showing how we can break the mold -- take our bearings by what works. You're here today because you're not afraid to reach for excellence -- and that's why I salute you all. \\\

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Ladies and gentlemen, on behalf of your grateful nation, thank you, keep up the good work and good works, and may God Bless you all.

# # # # #

Cards

March 9, 1992

MEMORANDUM FOR BETH HINCHLIFFE

FROM: MICHELE NIX

SUBJECT: PRESIDENTIAL SECONDARY AWARDS FOR EXCELLENCE IN SCIENCE AND MATH

Here's the poopski: The President will deliver remarks on Thursday, March 12, at 2:30 p.m., at a Rose Garden ceremony honoring the award winners (108 of them). The elementary award winners were honored last October in an equivalent ceremony. The awardees are here for a week-long lecture series.

Acknowledgements thus far include Dr. Walter Massey, Admiral Watkins, Secretary Martin, and Secretary Alexander.

I am contacting the National Science Foundation (which administers the awards) to come up with anecdotes/background on the award winners.

I've included the following:

- Fact sheets about the event
- Testimony transcripts of Dr. Bromley
- Agenda for week's events
- Report which outlines America 2000 initiatives, progress, and budget increases for education
- Past remarks (previous ceremonies for science and math award winners)

Remarks to Recipients of the Presidential Elementary Award for Excellence in Mathematics and Science Teaching

October 4, 1991

Please be seated. Late for class, I apologize, I apologize. [*Laughter*] But you might be interested in this. I was just meeting with the duly elected, democratically elected President of Haiti, who, as you know, has been overthrown. And we're very concerned, obviously, about democracy in that country. And so I hope you'll forgive me for being late for this event.

But I'm delighted to be here with Dr. Bromley, my science adviser, who is doing a superb job as we focus the nation's attentions on math and science and the need to be competitive in these areas, indeed, retain our leadership in the areas that you're so involved in.

And, of course, the same for Jim Watkins, our Secretary of Energy, who, not only does he have responsibilities as Secretary of Energy and gives me valuable advice in that field, and then based on his former role as Chief of Naval Operations, judgment on all of that, but he's never lost his abiding interest in education, something that he has been very prominent in before assuming these responsibilities. And he keeps up that interest. So, you've got two of our very best here.

I understand that we have teachers from all 50 States, DC, Puerto Rico, the U.S. territories and then our Department of Defense Dependent Schools; from West Germany to Fairmont, West Virginia, and from Austin, Texas, to Alpha, Illinois. So thank you for coming and congratulations to all of you.

Speaking of Illinois, I just was told the story about a school in Illinois that was named after Jack Benny. And every year, Benny made a point of going to the school and visiting the children. And one year he was speaking to a group of 12-year-olds and he asked if there were any questions. And a kid put up his hand. "Mr. Benny," he said, "why did they name you after our school?" [*Laughter*] That's really apropos of nothing here, but I kind of liked it.

But no matter where the school is or who it's named after, I believe that our math and science teachers are blessed with a gift for inspiration. And they possess the same drive that motivates their students to construct skyscrapers, or crack DNA codes, or craft race cars, or create new computer models, or climb aboard a spaceship. Not only are you adventurers, but you inspire your students to take their first steps in the adventure of their lives, the adventure of becoming educated men and women.

Some teachers with us today, each one a winner, arrived here at the White House from Indian reservations and inner cities, volcanic islands. And while the journey may have been long for some, it's been incredible for all, because along the way you have ignited the spark of understanding, the power of curiosity and the wonderful potential that lies latent in every child.

A teacher of young people and a student of man, the late—and he was a friend of mine and I know some of you must have known him—the former President of Yale University as well as Commissioner of Baseball Bart Giamatti once observed, "Teaching is an instinctual art, mindful of potential, craving of realizations." I think that's a true observation today, for now we're relying on each of you to practice the art of realizing potential.

No one said it would be easy. Two years ago, we met with the Nation's Governors. As you know, I did. We agreed to establish an ambitious set of educational goals to be met by the turn of the century, including first in the world in math and science. And some people say, "We can't do it." And I expect like most of you, I think we can. Math and science education is one of our top priorities. In fact, we've requested $1.9 billion of Federal spending on math and science education for Fiscal Year 1992, which translates into a 92-percent increase at the precollege level since the start of this administration. But it takes more than just money, it takes a commitment to world-class standards community by community, all across America.

And just this week, we learned some important information on the math and science front, some of which seems to surprise Americans.

First, it appears that today's students know about as much math and science as

their parents did 20 years ago when they were children. Rather than declining in skills, as most people have assumed, students are reversing that downward trend.

And secondly, however, five out of six eighth graders do not know what you math teachers think that they ought to know about math. This presents a tremendous challenge. For while our students' achievement is holding steady, the level of skills and knowledge required of them is skyrocketing.

There is encouraging news in all of this. We're working together to set world-class standards for national assessments in math, science, English, history and geography, to develop a better and clearer picture of where our strengths and weaknesses lie.

Our math teachers have already developed world-class curriculum standards. And just this month, the Department of Education granted half a million dollars to the National Academy of Science to do the very same thing with our science curriculum. Math teachers already work side-by-side with Governors and Members of Congress in taking steps towards the American Achievement Test. And I've asked that the first phase of this American Achievement Test be ready for use by the 1993–94 school year.

And finally, if we are committed to raising math and science standards to world-class levels, we must help our educators prepare themselves to teach those schools. And therefore, I have proposed to the Congress that we immediately establish Governors academies for teachers of math and science as well as teachers in the other core subjects in every State in the Nation.

And this week's goals report shows us how far we have still to go. But to get there, we must revolutionize American education: Not just school by school, but beyond, and community by community, certainly in family by family. In fact, in just a couple of hours—there's a reason Lamar is not here, our Secretary of Education—I'm going up to meet him and the board of directors of the New American Schools Development Corporation at Camp David. And they're seeking nothing less than to reinvent American education. And they're working to provide us a substantial amount of money so we can get that started.

And that's what, in essence, the overall America 2000 strategy is all about. And that's where we really need your help. We all agree that we want to teach kids to think straight, to appreciate the past, and look to the future to serve others and the community. But you hold the key to instilling intellectual excellence in your students and your colleagues. And your vigor, tolerance, your academic discipline, will stretch young minds. But your example will also build know-how for other teachers. In your classrooms and labs, you can really begin the revolution in American education.

An educator and teacher, the man who taught me a lot about the real business of living, a man named Claude Fuess, said a very interesting thing. He was the headmaster at Phillips Academy. A very interesting thing the day he retired after 40 years of teaching, he said, "I was still learning when I taught my last class."

As we face the daunting task of redefining American education, let's remember, the best teachers never stop learning. And the best ones learn constantly to think anew. And that sense of innovation is the key to creating a new generation of American schools. If we're to make a difference in the schools, we must break the mold and see what works. We need to keep learning new ways. We need to keep trying new ideas.

You won these awards because you experiment with new ideas, you're not afraid to experiment with new teaching methods. And for that, you have your country's heartfelt thanks and best wishes. And what's even better, you have the gratitude and admiration of the most important people in the world, and that is your students.

So thank you all. Congratulations. Thank you very, very much for being with us on this beautiful day in the Rose Garden. And keep up that fantastic leadership.

Thank you all.

Note: The President spoke at 10:10 a.m. in the Rose Garden at the White House. In his remarks he referred to: President Jean-Bertrand Aristide of Haiti; Dr. D. Allan Bromley, Assistant to the President for Science and Technology; Secretary of Energy James D. Watkins; former commissioner of baseball A. Bartlett Giamatti; and Secretary of Education Lamar Alexander. A tape was

not available for verification of the content of these remarks.

The President's News Conference
October 4, 1991

The President. Today's unemployment figures show the economy is moving in the right direction. The drop in unemployment is one more sign that the economy is strengthening. Data released just this week showed new car sales were up, housing sales were up, purchasing managers index was bullish on the manufacturing sector. And people should take note of the fact that interest rates are falling to levels that we haven't seen since 1977.

Although I believe that the economy is on the right track, let me be the first to say all is not well. I'm deeply concerned about those who are out of work. Unemployment benefits are important. Congress should provide a responsible extension of such benefits.

The bill that we've been for for some time, the Dole bill, does just exactly that. And I'll sign a bill that helps people and also protects the overall economy by keeping to the budget agreement. As I said, there is a bill in Congress to do that right now. And if Congress gives me that bill, I will sign it immediately.

I'll be glad to take some questions.

Situation in Haiti

Q. Mr. President——

The President. Yes, Terry [Terence Hunt, Associated Press].

Q. You said this morning that you're committed to the restoration of the democratically elected government in Haiti. Are you willing to go beyond economic pressure to use of multinational military intervention to defend democracy?

The President. Well, I am very hopeful that this matter can be resolved without such a multilateral force. The United States has been, and properly so, very wary of using U.S. forces in this hemisphere. There's a lesson out there for all presidents, and the lesson I've learned is that you've got to be very, very careful of using United States forces in this hemisphere.

So, I'd like to think that this mission by the Organization of American States will do it. We are committed to democracy in Haiti. We want to see Aristide restored to power. We had a long talk with him today, not only about the restoration of that, but he reiterated a commitment to human rights there. So, let's hope that that can be done without any kind of force. I hope that's what the result will be of this multinational mission that's going down there under the leadership of the OAS. I think that's the way to go.

They've had a hearing in the United Nations, and the United States clearly is upset when internal affairs result in the setting back of democracy. And that's what's happened. So we're committed to the restoration of democracy and a strengthening of democracy in Haiti. We feel very strongly about it.

I am reluctant to use U.S. forces to try to accomplish it, except if American citizens' lives are in any way threatened, of course. I feel that is a direct concern and responsibility of the President.

Q. Would you take part in a multinational force?

The President. Well, I think we've got to wait to see. I don't want to get out ahead of where this OAS mission is. And I would like to see it succeed without having to use force or having to put together such a force, say nothing of use it.

Unemployment Benefit Extension

Q. Mr. President, what should 10 million people who are out of work and the 95,000 people in Michigan who were taken off welfare rolls, what should they do now to survive until the economy does rebound?

The President. They should demand of their Congress to pass a bill that the President can sign. And I'm committed to such a bill to extend unemployment benefit compensation, and I'd like to have it passed and sent down here. And if it means vetoing a bad bill so that the people that are working and the people whose families are hurting but are just making ends meet so that they can have a better shot—and I'm talking about not breaking the budget agreement—that's what I'm going to do. I'm not going to take something that's bad. And so what

Anecdote re Julie Csongor [Chunger]:

She left Hungary right after the Hungarian revolution. She moved to Canada and then has been in the United States for the past 18 years. She teaches grades 10-12 at St. Mary Goretti High School in Philadelphia. She teaches geometry and calculus. She is now also working on her doctorate through Hungary.

Quotes from her about receiving the award are attached.

Fax to Michelle Nix 456-6218

"I have my cake in my classroom everyday. The award is my icing.

" The only time you fail is when you stop trying "

"America is the land of opportunity where dreams can come true, but I never dreamed I would be a Presidential awardee."

"I want to share this award with all my colleagues — the unknown teacher — like the unknown soldier."

Julie Csanyi quotes — from Dr Madeleine J. Long
NSF

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

DATE 3/11/92

TO: Michelle Nix

ADDRESS:

TELEPHONE NUMBER:

FAX NUMBER: 6218

FROM: Lisa Coldwell

TELEPHONE NUMBER: 6272

FAX NUMBER: (202) 395-3261

NUMBER OF PAGES, INCLUDING COVER SHEET 4

This should be helpful (at the last minute, I'm afraid).

Talk to you soon,

Lisa

THE WHITE HOUSE

WASHINGTON

March 11, 1992

PRESIDENTIAL AWARDS FOR EXCELLENCE
IN SECONDARY SCIENCE AND MATHEMATICS TEACHING

DATE: MARCH 12, 1992
LOCATION: ROSE GARDEN
TIME: 2:30 P.M.
From: D. Allan Bromley

I. PURPOSE

You will address the secondary school teacher recipients of the 1991 Presidential Award for Excellence in Science and Mathematics Teaching.

II. BACKGROUND

Established in 1983 by the Education for Economic Security Act, the awards are given annually to 108 elementary and 108 secondary mathematics and science teachers (four from each state), from the District of Columbia, Puerto Rico and the U.S. territories. You addressed the 1991 elementary school award recipients on October 4, 1991.

This award represents the highest honor of its kind that K-12 science or mathematics teachers can receive in the United States. It recognizes the efforts teachers have made to improve the skills of our Nation's young people. In addition to a trip to Washington, D.C. for themselves and a guest, the award includes a Presidential certificate and a $7,500 grant given to the recipient's school.

Award recipients are chosen on the basis of the excellence of their teaching performance and consideration of their background and formal education, continuing education activities, teaching experience, and other activities related to their role as a teacher. The nomination and selection process is conducted at the State level by the Council of State Science Supervisors and the National Council of Teachers in Mathematics.

Dan

Memorandum for Speechwriting Staff

From: Dan McGroarty

Regarding: Science & Math

Please return your comments to Room 122 by: 2pm

Today's Date: MAR 11 1992

Beth—
I asked that you add a sentence.
to link education w/ our economic health.
It's not on here.— Hewson Moore just called with precise
(Hinchliffe/Nix) the same
March 11, 1992 10 a.m.
AWARDS Draft Two

PRESIDENTIAL REMARKS: AWARDS FOR EXCELLENCE IN SCIENCE AND MATH Comment.
ROSE GARDEN
THURSDAY, MARCH 12, 1992 2:30 P.M.

Thank you, and welcome to the Rose Garden. I'm glad my previous meeting didn't run late, or I would have had to bring a note from Barbara. \\ It's great to see you here -- Secretary Martin, Dr. Massey, Dr. Wong -- and, most of all, let me welcome the 108 very special men and women chosen from over 1/4 million eligible secondary teachers. I'm proud to present you with this nation's highest honor for math and science teachers.

[As teachers, you know first-hand what the spirit of innovation has brought to this country: though times have changed. we're not always ready for change.
Some ~~say that~~ times I think that if Edison were to invent the light bulb today, ~~we'd have studies citing the dangers of electricity. And the~~ newspapers would headline the story: "Candle Industry Threatened."\\\]

You have shown the kind of excellence that will help this country meet the ambitious goals we've set for ourselves and for our nation in our America 2000 education strategy -- goals worthy of the talent you have, and of the potential of our kids. We know we've got to be competitive in math and science in a changing world. ~~That's why~~ We've called on our kids to be #1 in the world in these subjects by the turn of the century. It's teachers like you who will help us reach our goal.

As you know, we've set world-class standards for national assessment in five core areas -- including math and science -- and we've set a deadline for the first phase of this American

Achievement Test: the start of the 1993-94 school year. Many math teachers have already developed world-class curriculum standards -- and last fall, the Department of Education granted $1/2 million to do the same in science.

~~We're committed to these goals.~~ All told, we've requested more than $2 billion in Federal spending on math and science education for next year's budget -- $768 million of that for pre-college, an increase of 132% in the last three years.

But I believe that the single most important thing we in the Federal Government can do is to help you do your jobs. For instance, also in next year's budget, I proposed an expanded program of training so that every math and science teacher in the nation will receive in-depth, up-to-date training, in part using federal laboratories and federal personnel. ~~This will~~ create a world-class corps of teachers.

We also want to bring new technology into the classroom, so kids can interact with astronauts, explorers and scientists; so rural schools can have access to state-of-the-art resources; and so all American kids can be exposed to the cutting-edge technologies and ideas that will shape their future.

The Federal Government can do a lot -- but we cannot do it all. Real excellence demands commitment from all of us as we work to create a new generation of American schools. We will reinvent the American school community by community, neighborhood by neighborhood, across this country. You're showing us the way. You're showing how we can break the mold -- ~~and see~~ what works.

You're here today because you're not afraid to reach for excellence -- and that's why I salute you all.

I salute winners like Julie Csongor [CHUN-ger], of Philadelphia, who fled the persecution of her native Hungary and came here, unable to speak English. Now she gives of herself to a generation of American kids, and says: "I have my cake in my classroom everyday. The award is my icing."

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I'm proud to meet you because your vision of education is impressive -- and you propose some creative and innovative solutions. That's what we're searching for with every issue we face -- the experience and ideas of the people who live with these problems day in and day out.

But, mostly, I'm proud to meet you because you demonstrate

what it will take to make our students the best in the world. You encourage students by giving them direct hands-on experience. You foster curiosity ~~and generate excitement~~ not just in your kids, but also in their parents and in your colleagues. You still have the joy of discovery, the excitement of optimism -- you still ask questions, and try new ways. Above all, you believe in your kids -- and in the future of this nation. That's the spirit we all need.

We all know the real rewards of teaching aren't the certificates you'll receive today -- but are something much more important ~~as~~ Sir Thomas More described in the play "A Man For All Seasons." At one point, he suggests to a young man that he would make a fine teacher. "And if I was," the boy asks, "well, who would know about it?" And Sir Thomas replies: "You, your pupils, your friends, God -- not a bad public, that."

Ladies and gentlemen, on behalf of your grateful nation, thank you, keep up the good work, and may God Bless you all.

# # # # #

2101 Constitution Avenue Washington, D.C. 20418-0001

OFFICE OF NEWS AND PUBLIC INFORMATION (202) 334-2138

FACSIMILE TRANSMISSION

TO: Michelle Nix - Presidential Spech Writing Office

FACSIMILE NUMBER: [456-6218]
PHONE NUMBER: [7750]

FROM: Richard Julian
Media Relation Assistant
NAS-NAE-NRC-IOM Office of News and Public Information
March 11, 1992

NUMBER OF PAGES,
INCLUDING COVER SHEET: [3]

MESSAGE: Press release on D of Educ. grant. The National Research Council is the principle operating agency of the National Academy of Sciences and the National Academy of Engineering. I would appreciate if you could fax me an FYI copy of the President's speech for our files.

thank you, Richard

OFFICE OF NEWS AND PUBLIC INFORMATION

TELEPHONE (202) 334-2138
FACSIMILE (202) 334-2158

news from the NATIONAL RESEARCH COUNCIL

The National Research Council was organized by the National Academy of Sciences in 1916 in order to provide for a broader participation by American scientists and engineers in the work of the Academy. The Academy was chartered by the U.S. Congress in 1863 as a private organization with a responsibility for examining questions of science and technology at the request of the Federal Government. The National Academy of Engineering was organized in 1964 under the original NAS charter. The National Research Council now serves as the agent of both Academies in the conduct of studies and investigations in the public interest.

2101 CONSTITUTION AVENUE, N.W., WASHINGTON, D.C. 20418 AREA CODE 202 334-2000

Date: September 19, 1991
Contact: Craig Hicks
(202) 334-2138

FOR IMMEDIATE RELEASE

NATIONAL RESEARCH COUNCIL TO COORDINATE DEVELOPMENT OF STANDARDS FOR SCIENCE EDUCATION

WASHINGTON -- Education Secretary Lamar Alexander has announced a Department of Education grant to the National Research Council to coordinate the development of science education standards, as called for in the 1990 education plan of the nation's governors and AMERICA 2000, President Bush's education strategy.

"This grant will enable the National Research Council to bring together the nation's leading science organizations and distinguished educators to develop new standards and assessment approaches in science for grades kindergarten through 12," said Alexander.

The Research Council, through its new Coordinating Council for Education, will establish a National Committee on K-12 Science Standards and Assessment. The committee will work with other groups to develop a national consensus on what students should know and be able to do in science and will also design approaches to measure students' progress.

AMERICA 2000 calls for the establishment of standards in five core subjects: mathematics, sciences, history, geography, and English for students in kindergarten through high school to help the nation reach the national education goal of making U.S. students first in math and science achievement by the year 2000.

(MORE)

National standards are being designed to allow school systems to determine their own classroom approaches within a framework of clearly defined, consensus-supported goals.

The standard-setting process in science will be patterned after the experience of the mathematics community at large and specifically the National Council of Teachers of Mathematics in developing mathematics curriculum and teaching standards. It will rely heavily on work of the American Association for the Advancement of Science, the National Science Teachers Association, and other organizations. The National Education Goals Panel and the National Council for Education Standards and Testing also will serve as resources to the committee.

Said Frank Press, chairman of the National Research Council and president of the National Academy of Sciences, "Whether they're working on the job or trying to make sense of issues like health care or the environment, Americans increasingly need to understand scientific principles and be able to reason scientifically. That's why we need to improve the standards for science education and make clear what we expect our students to learn."

The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering. The academies are private, non-profit organizations whose members advise federal officials and private industry on science and technology.

The $500,000 grant, under the Department of Education's Dwight D. Eisenhower National Program for Mathematics and Science Education, will fund the first year of a three-year program.

# # #

ch: F, H, L

ROSE GARDEN CEREMONY
PRESIDENTIAL AWARDS FOR EXCELLENCE IN SCIENCE AND MATHEMATICS TEACHING
(SECONDARY)

Sec. Martin **POTUS** *Dr. Massey* *Dr. Wong*

Teachers and Spouses *Teachers and Spouses*

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PRESS

** Dr. Massey is Director of the National Science Foundation (NSF); Dr. Wong is the Acting Director (in Dr. Bromley's absence) of the Office of Science and Technology Policy (OSTP).*

THE WHITE HOUSE

WASHINGTON

March 11, 1992

PRESIDENTIAL AWARDS FOR EXCELLENCE IN SECONDARY SCIENCE AND MATHEMATICS TEACHING

DATE: MARCH 12, 1992
LOCATION: ROSE GARDEN
TIME: 2:30 P.M.
From: D. Allan Bromley Allan

I. PURPOSE

You will address the secondary school teacher recipients of the 1991 Presidential Award for Excellence in Science and Mathematics Teaching.

II. BACKGROUND

Established in 1983 by the Education for Economic Security Act, the awards are given annually to 108 elementary and 108 secondary mathematics and science teachers (four from each state), from the District of Columbia, Puerto Rico and the U.S. territories. You addressed the 1991 elementary school award recipients on October 4, 1991.

This award represents the highest honor of its kind that K-12 science or mathematics teachers can receive in the United States. It recognizes the efforts teachers have made to improve the skills of our Nation's young people. In addition to a trip to Washington, D.C. for recipients and their guest, the award includes a Presidential certificate and a $7,500 grant given to the recipient's school.

Award recipients are chosen on the basis of the excellence of their teaching performance and consideration of their background and formal education, continuing education activities, teaching experience, and other activities related to their role as a teacher. The nomination and selection process is conducted at the State level by the Council of State Science Supervisors and the National Council of Teachers in Mathematics.

III. PARTICIPANTS

President Bush
Secretary Martin; Department of Labor
Dr. Walter Massey; Director, National Science Foundation
Dr. Eugene Wong; Acting Director (in Dr. Bromley's absence), Office of Science and Technology Policy
108 secondary school teachers and their invited guests

IV. PRESS PLAN

Pooled White House Press Coverage

V. SEQUENCE OF EVENTS

-- Enter Rose Garden

-- Greet Secretary Martin, who will be seated in the front row, next to the aisle.

-- Give remarks

-- Depart Rose Garden

VI. REMARKS

To be provided by speechwriters

To Michele

Date 3/11 Time 12:30p

WHILE YOU WERE OUT

M Lisa Coldwell

of

Phone 6272

Area Code Number Extension

TELEPHONED	X	PLEASE CALL	X
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		URGENT	
RETURNED YOUR CALL			

Message re- tomorrow's speech to the teachers

SLL

Operator

AMPAD EFFICIENCY® 23-021 CARBONLESS

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

DATE 3/11/92

TO: Dan McGroarty

ADDRESS:

TELEPHONE NUMBER:

FAX NUMBER: 6218

FROM: Lisa Coldwell

TELEPHONE NUMBER: 6272

FAX NUMBER: (202) 395-3261

NUMBER OF PAGES, INCLUDING COVER SHEET 2

One minor comment, Dan.

Thanks!

what it will take to make our students the best in the world. You encourage students by giving them direct hands-on experience. You foster curiosity and generate excitement not just in your kids, but also in their parents and in your colleagues. You still have the joy of discovery, the excitement of optimism -- you still ask questions, and try new ways. Above all, you believe in your kids -- and in the future of this nation. That's the spirit we all need.

We all know the real rewards of teaching aren't the certificates you'll receive today -- but are something much more important, as Sir Thomas More described in the play "A Man For All Seasons." At one point, he suggests to a young man that he would make a fine teacher. "And if I was," the boy asks, "well, who would know about it?" And Sir Thomas replies: "You, your pupils, your friends, God -- not a bad public, that."

Ladies and gentlemen, on behalf of your grateful nation, thank you, keep up the good work, and may God Bless you all.

# # # # #

Awards were presented today, March 11th, at an awards ceremony at the National Academy of Sciences.

(Hinchliffe/Nix)
March 9, 1992 8 a.m.
AWARDS Draft One

PRESIDENTIAL REMARKS: AWARDS FOR EXCELLENCE IN SCIENCE AND MATH
ROSE GARDEN
THURSDAY, MARCH 12, 1992 2:30 P.M.

Thank you, and welcome to the Rose Garden. I'm glad my previous meeting didn't run late, or I would have had to bring a note from Barbara. \\ It's great to see you here -- Secretary Martin, ~~Alexander~~, ~~Admiral Watkins~~, Dr. Massey Dr. Wong -- and, most of all, you 108 very special men and women chosen from over 1/4 million eligible secondary teachers. I'm proud to present you with this nation's highest honor for math and science teachers.

[As teachers, you know first-hand what the spirit of innovation has brought to this country: though times have changed. Some say that if Edison were to invent the light bulb today, we'd have studies citing the dangers of electricity. And the newspapers would headline the story "Candle Industry Threatened."\\\]

You're key players in our ambitious America 2000 education strategy. You have shown the kind of excellence that will help this country meet the goals we've set for ourselves -- tough goals, challenging goals, goals worthy of this great nation, of the talent you have, and of the potential of our kids. The goals focus our attention on the critical need to be competitive in math and science in a changing world. We call on our kids to be #1 in the world in these subjects by the turn of the century. Possible? When I see you teachers here, I say -- you bet.

The goals also call on us to set world-class standards for national assessment in five core areas -- including math and

science -- and I've asked for the first phase of this American Achievement Test to be ready for use by the start of the 1993-94 school year. Many math teachers have already developed world-class curriculum standards -- and last fall, the Department of Education granted $1/2 million to do the same in science.

We're committed to these goals. We've requested $2.~~00~~ billion in Federal spending on math and science education for FY'93. But I believe that the single most important thing we in the Federal Government can do is to help you do your jobs. For instance, also in this year's budget, I proposed an expanded program of training so that every math and science teacher in the nation will receive in-depth, up-to-date training, in part using federal laboratories and federal personnel. This will create a world-class corps of teachers.

We also propose to accelerate use of technology in classrooms, so kids can interact with astronauts, explorers and scientists; so rural schools can have access to the best resources available; and so all American kids can be exposed to cutting-edge technologies and ideas as they step toward the future.

We're your partners -- but the Federal Government can only go so far. Real excellence demands commitment from all of us as we try to create a new generation of American schools. We will reinvent the American school community by community, neighborhood by neighborhood, across this country. You're showing us the way. You're showing how we can break the mold and see what works. You're here today because you're not afraid to reach for

excellence -- and that's why I salute you all.

And I also envy you. You share in our kids' sheer joy of learning, of making something work, of understanding the world. And the scientist or engineer who will one day discover the cure for cancer, or who will use technology to push back the frontiers of space or wipe out hunger -- that man or woman is, today, a kid somewhere out there -- maybe in your classroom. A kid who will catch a spark from you -- a spark that will change his life, and his world's. That's your gift: a teacher affects eternity.

[SPECIFIC STORY TO COME]

I'm proud to meet you because your vision of education is impressive -- and you propose some creative and innovative solutions. That's what we're searching for with every issue we face -- the experience and ideas of the people who live with these problems day in and day out.

But, mostly, I'm proud to meet you because you demonstrate what it will take to make our students the best in the world. You encourage students by giving them direct hands-on experience. You foster curiosity and generate excitement not just in your kids, but also in their parents and in your colleagues. You still have the joy of discovery, the excitement of optimism -- you still ask questions, and try new ways. Above all, you believe in your kids -- and in the future of this nation. That's the spirit we all need.

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Ladies and gentlemen, on behalf of your grateful nation, thank you, keep up the good work, and may God Bless you all.

# # # # #

Per
Randy Beales DOE

- Federal spending on math + science education is 2.1 billion — a ___% increase since the start of his administration

- Fed spending on math + science education is 768 million — a ___% since the start of GB's administration

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
NATIONAL SCIENCE FOUNDATION
1800 G STREET, NW., SUITE 516
WASHINGTON, DC 20550
TELEPHONE (202) 357-7557
FAX (202) 357-7009

FACSIMILE TRANSMISSION

NUMBER OF PAGES TO FOLLOW: 6

DATE: March 11, 1992 TIME: 9:25

TO:

NAME: Michelle Nix

ADDRESS:

FAX NO.: 202 - 456 - 6218

FROM:

NAME: Keni Jones

DIVISION: NSF - TPE ROOM: 638 PHONE: 357-7287

COMMENTS:

As discussed. Please call if you have any questions.

Keni Jones.

Presidential Awards for Excellence

Excerpts from Applications for Potential Use in President's Speech

Changes Needed in the System

1.Kevin Collins
Sandpoint Junior High School
Sandpoint, Idaho
Science

The system needs to be more flexible to provide this very special age group (junior high) with a more varied curriculum. Setting up a communication center with the necessary computers, modems, software and phone lines will allow students to explore worlds which are no inaccessible.

2. Ralph M. Feather, Jr.
Derry Area Senior High School
Derry, Pennsylvania

Science - Earth Science

Science needs to be tied to everyday life. This can be accomplished through courses in the history and philosophy of science.

3. Linda J. Sanchez
Taylor Middle School
Albuquerque, New Mexico

Mathematics

Everyday math activities should incorporate writing. This can be accomplished through keeping a math journal which describe learning experiences and express any confusions.

4. Benita Hackett Albert
Oak Ridge High School
Oak Ridge, Tennessee

Mathematics

Application of mathematics is linked with technology which must come alive in the classroom and which must be equitable. Technology purchases for the classroom are needed.

5. Denise Goffman
Sweet Home Middle School
Amherst, New York

Mathematics

Math anxiety exists everywhere. Working with both parents and teachers is needed to overcome this anxiety. Math need not be dealt with in isolation.

Innovative Methods

1. Gary Arthur Bender
Tanana Junior High School
Anchorage, Alaska

Science - Earth Science, Physical Science

Rube Goldberg Project - "The project requires that the students or student groups (size maximum of four) build a device or series of devices that illustrate a minimum of six forces and energy changes (the number increases as the size of the group increases.)" (The projects are videotaped. Last year part of the demonstrations were professionally videotaped by a group of educators going to the Soviet Union to discuss different styles of learning.)

2. Elizabeth Fulton
North Little Rock High School
Little Rock, Arkansas

Science - Biology

Zoobeast - Adapted from an activity which appeared in "The Science Teacher" twenty years ago. Students create their own animal species in under nine weeks. The creature may be a mutant of a now existing or extinct species, one that has migrated to earth form another planet or a completely new species. The animal must be able to live successfully in the environment selected for it. No magical powers are allowed, everything must obey Earth's present natural laws.

3. Beatrice Epperon
McNary High School
Keizer, Oregon

Science - Chemistry

Environmental Chemistry Unit

Topics: Global warming, Acid rain, Ozone depletion, Toxic waste

Activities include: research paper, simulated community forum, lab work, and field studies.

4. Jenny Jorgensen
Bath Junior High School
Bath, Maine

Mathematics

Representing mathematics through art - Students work with shapes and tessellation, putting shapes within shapes, side by side, to better understand geometry. The work of the artist Escher is used as a model.

5. Kathleen Walker Murrell
J. Frank Dobie High School
Houston, Texas

Mathematics

Cobwebs Larger than Life - The classroom is used as the three dimensional coordinate system as students are introduced to three variable equations. The resulting hands-on (yarn and cardboard) graphing of solutions results in cob-web planes. A connection is solidly formed between geometric and algebraic representations.

Excerpts for Letters of Recommendations

1. John E. Yanaitis
   William Penn High School
   New Castle, Delaware

   Science

Former student:

" ... unique style of classroom teaching that combines conventional bookwork with interesting experiments, computer demonstrations, and his own ingenious methods of teaching."

2. Bob Rose
   Wichita Collegiate School
   Wichita, Kansas

   Science

School Headmaster:

"His instruction invites students to ask themselves why they believe what they believe. He encourages independent and critical thinking."

3. Helen D. Perry
   Mississippi School for Mathematics and Science
   Columbus, Mississippi

   Science - Physics

Former student:

"I learned from her not only the basics of physics, but also how to analytically solve problems of all types."

4. Karen C. Dietrich SSJ
St. Rose High School
Belmar, New Jersey

Science - Biology

Former student:

"Readily available to her students, she challenged us to "risk living" by reaching beyond the expected and to strive for something more. We learned that our education only began when we left her classroom.....By example she taught and by her nature she inspired. Always abreast of new findings and discoveries she encourages us to look beyond the obvious for discoveries of our own.

5. Anne C. Thompson
Washington High School
Sioux Falls, South Dakota

Mathematics

Former student:

"Her class is three-dimensional. It is not just the two dimensions of teacher and students, but it is those and the third of teacher and students all sharing in valuable learning experiences. We students are enveloped in a sphere of learning that is mathematical, but is also applicable."

Remarks and a Question-and-Answer Session With Students and Faculty at Oakton High School in Vienna, Virginia
March 24, 1988

The President. I know that two of your Congressmen, Frank Wolf and Stan Parris, are with us here today. I hope they haven't been talked into leaving their present occupation and—[*laughter*]. Should we move the class outdoors? [*Applause*]

Well, you know, being here in school today sort of reminds me—well, would you mind if I told you one of my favorite stories about schools? It seems a little boy had to take home a bad report card. And the next day back in his classroom he walked up to his teacher and said, "Teacher, last night my daddy told me that if my grades didn't improve, somebody was going to be in big trouble. So, I'd be careful if I were you." [*Laughter*]

But it's not so very long ago that all of American education needed to improve, or we were all going to be in big trouble. Back in 1983 a report entitled "A Nation at Risk"—that report itself said that the educational foundations of our society were being eroded by "a rising tide of mediocrity that threatens our very future as a nation and a people." Well, it was time to stem that tide, to get our educational house in order, or to suffer the consequences.

I'm particularly pleased to have the opportunity to learn about what Fairfax County has done to improve the quality of your teachers. You have become leaders in promoting excellence in the teaching profession, and I'm here to find out more about what works. Next month Secretary Bennett will turn in to me a homework assignment—yes, even Cabinet members have homework assignments—one that I gave him last March, asking for a status report on American education. Come to think of it, Bill, that's an awfully long time to complete an assignment. [*Laughter*] But don't worry; your work so far has been "A-plus." But the Secretary's report will tell us what kind of progress we've made over the last 5 years, and it will tell us what things we still must do. Secretary Bennett, I'm looking forward to reading your report and to continuing to work closely with you on specific ways that we can improve education. There are few areas of American life as important to our society, to our people, and to our families as our schools.

By the way, if I could just interject something here, if there's anybody who proves that learning doesn't have to be dull, that education and fun can go together, it's our nation's Secretary of Education, Bill Bennett. Secretary Bennett has a law degree and a Ph.D. in philosophy—that's pretty serious-sounding stuff. But he also happens to be an expert on something many of you probably know quite a lot about: rock 'n' roll. [*Laughter*] And I'll prove it.

Bill, who sang "Rock Around the Clock"?

Secretary Bennett. Bill Haley and the Comets.

The President. Name the two lead singers of the Drifters.

Secretary Bennett. Clyde McPhatter and Ben E. King.

The President. And what's at the top of this week's Top Forty?

Secretary Bennett. I don't have the foggiest idea, Mr. President.

The President. You mean, you don't know the answer?

Secretary Bennett. No, sir.

The President. But, Bill, everybody knows that this week's number one song is Michael Jackson's "Man in the Mirror." [*Laughter*] But, don't feel bad, Bill; two out of three isn't bad. But there's a serious point here, one I hope you'll always remember. Learning and fun can go together. And in many ways, the more you know, the more fun you can have.

Now, some of you may have heard that I've taken to visiting schools lately to find out firsthand what's going on. I must say these trips have strengthened my confidence in our country's future. The reason? When you visit schools like Oakton, you realize that they just don't come any better or any brighter than America's students and teachers.

Two months ago I visited Suitland High School in Prince George's County, Maryland. A few years ago Suitland had problems, bad problems—low academic performance, poor attendance by both students and teachers. But Suitland High School turned itself around, and it did so in large part by supporting some of the key articles of the education reform movement: parental choice in the form of magnet schools and increased accountability on the part of students, teachers, and administrators alike.

Now I've come to Oakton. I've done so to pay tribute to your school and to your superintendent, Robert Spillane, for his outstanding efforts on behalf of excellence in education in Fairfax County. And I'm especially impressed by all you've done in attracting and retaining good teachers. And it's teaching that I'd like to speak about for a moment or two today. It seems to me that given the job that teachers do, given the number of young lives they affect, teachers deserve at least as much praise and thanks and honor as those in any other profession in our society. So, I wonder: Would you students join me for a moment in applauding your own teachers here at Oakton? [*Applause*] You don't know what you've just done. I come from a business where getting a hand was the most important thing in life.

You know, I have to tell you a little story, if I could, about a teacher that had an impact on my life. And this happens, and will happen to all of you, as the years go on. Yes, I remember a teacher. I was in his office one day—and not by invitation—by order. [*Laughter*] He was the principal as well as the English teacher in our school at that time. And in the course of his words to me he said, "Reagan, it doesn't matter much to me what you think of me now. What I'm concerned about is what you'll think of me 15 years from now." Well, I guess I just took that in stride. But, well, after 15 years I had the pleasure of telling that man how much an impact he had made on my life and then, those many years later, how important he was to me in all the things that I was doing. And to increase the pleasure I get from that memory was that it was only a short time later that I heard he had departed, he had left us, died. But I was able to tell him, and he had been right about when I would remember about him.

I was very pleased the other day to read of a poll that shows a sharp increase among college students who intend to enter the teaching profession. And I'm curious—having heard some remarks about this very subject just a moment ago—could the students in this audience who are just thinking that maybe they might become teachers please raise their hands? I see from up here a scattering of more hands than you down there probably. So, well, good for you.

I'd like to tell you something about an American hero, Sam Houston. He once wrote—in his lifetime, Sam Houston was a frontiersman, a soldier, a general, a U.S. Senator, a Governor, and yes, even a President—President of the Republic of Texas. And for a while in Maryville, Tennessee, he was a teacher. Years later, as Sam Houston looked back over a lifetime of accomplishments, he wrote that being a teacher gave him a higher feeling of dignity and self-satisfaction than any other office or honor he had ever held. Well, that speaks volumes.

Now, just why have we seen this increase in teaching lately—this increased interest, I should say. Well, in part, it's because we've begun to reward excellence in the teaching profession—as you've been told already—just as we reward excellence in any other profession. We've begun to introduce free-market principles like incentives and accountability in education. Listen, for a moment, to the recommendations of the "Nation at Risk" report: "Salaries for the teaching profession should be increased and should be professionally competitive, market-sensitive, and performance-based. Salary, promotion, tenure, and retention decisions should be tied to an effective evaluation system that includes peer review so that superior teachers can be rewarded, average ones encouraged, and poor ones either improved or terminated."

The report also recommended that "qualified individuals, including recent graduates with mathematics and science degrees, graduate students, and industrial and retired scientists could, with appropriate preparation, immediately begin teaching in

these fields." And you heard that that's taking place here and is approved in your county. And it said that "incentives should be made available to attract outstanding students to the teaching profession." Well, today we can see that Fairfax County has taken these recommendations to heart. Your blue ribbon commission pointed to the necessity of recruiting and maintaining excellent teachers, and said that the people of Fairfax County are willing to pay more for good teachers if there is assurance of quality control and accountability. The school board approved the plan, and Dr. Spillane met with the teachers to get their advice and support.

Fairfax County has shown the Nation how to upgrade the teaching profession by demonstrating how to attract and retain good teachers. Career ladders, performance-based pay, and other initiatives help to keep good teachers in the profession. Everybody benefits—students, parents, and teachers. To improve the quality of the teaching force, Virginia is moving toward requiring a prospective teacher to have a bachelor of arts degree in a subject area rather than an education degree. Virginia also allows teachers to enter the profession through the alternate certification route. Your alternate certification allows school systems to draw from an expanded pool of qualified teachers and enables qualified ex-military personnel, scientists, engineers, and others to become teachers. I wonder, Superintendent Spillane, do ex-Presidents qualify for this program? [*Laughter*] Well, there you have it. It's no mystery. It's a miracle. We know what works in education, and we understand, in particular, the vital importance of good teaching.

There's one topic in this regard that's of special importance to Nancy and me: putting an end to drug abuse. When it comes to drugs and education, let me just say this: If a school has a drug problem, then we might as well stop and forget about improving education through qualified teachers, a solid curriculum, high expectations, performance-based pay, or any other reform measure. If students are using drugs, then no education can work. If kids are using drugs, they won't learn. It's that simple. It's that awful. And so, we need to get tough on drugs, on drug pushers, but also on drug users. We need to get drugs out of our schools and our neighborhoods. We need to get drugs out of our children's lives. So, I commend Fairfax County for your efforts—commend you from my heart—and urge you to continue the good fight.

You know, let me just say something to you here and issue a challenge. You stop to think: not only the drugs and the effect they have on people and the destruction that they can create but that there are some soulless people who are living in the veritable lap of luxury, with literally billions of dollars, at the highest standard of living, and paying no taxes or supporting no worthwhile operation. They are supported by those who are their customers. Why shouldn't your generation—now with the changes that we've tried to make in your behalf—why don't you make up your minds that your generation is going to be the one that decides there will be no more drug customers in this country of ours, that you are going to eliminate drugs by taking away their customers? Your generation will be the one that makes that change overall in the United States.

I've talked quite a lot about teaching this afternoon, and there's one story that just about says it all when it comes to the importance of teachers. The story comes from Robert Bolt's play, a drama called "A Man For All Seasons." It's about Thomas More, a great man who lived in England some 400 years ago. The story goes like this. A young man, Richard Rich, approached Sir Thomas for advice on prospective careers. Rich is a bright and ambitious young man and is considering law or politics. But instead Sir Thomas More makes this suggestion: "Why not be a teacher? You'd be a fine teacher—perhaps even a great one." "And if I was," asked Rich, "well, who would know about it?" And Sir Thomas in the play replies, "You, your pupils, your friends, God—not a bad public, that."

Well, that isn't a bad public. It's our teachers' public. And I've come here today to pay tribute to you for your efforts. And to you here at Oakton High who have done so much to foster good teaching and an understanding of teaching's importance, on

behalf of a great many people in this country, I thank you.

Now, it so happens that in order to give Secretary Bennett that pop quiz I did a little homework myself. And to tell you the truth, I was really struck by Michael Jackson's song, "Man in the Mirror." It's a wonderful song. It's full of energy and drive and, of course, that helps to make the point that I was talking about earlier: learning and fun go together. After all, Michael Jackson and the others involved have spent years training as musicians, learning to read and write music, mastering vocal techniques, becoming highly skilled at playing various musical instruments. The result of all this training and education? Well, as I said, the result is a wonderful, powerful song. But the song has a powerful moral as well: "I'm starting with the man in the mirror. I'm asking him to change his ways."

Well, it's true—whether the problem is improving education or eliminating drug abuse or helping the homeless—whatever the challenge, individual initiative and responsibility is always part of the answer. And so, as I thought about the message I'd like to leave with you, as I considered what word I could give to you, in your youth, and for many years, well, I decided that this week's top song would do just fine.

My young friends, you've given me such a gift today—the gift of your energy, your exuberance, and your love of learning. And, always to remember: "No message could be any clearer. If you want to make the world a better place, just start with the man in the mirror." Thank you, and God bless you all.

Ms. Thomas. Thank you very much, Mr. President. The students have a few questions that they would like to ask you if you would be willing to answer them.

The President. I'd love to.

Academic Standards

Q. Mr. President, do you feel that the pressure to achieve and the competition between students in the United States is as great today as it was in your high school days?

The President. Is it as great today?

Q. Yes, sir.

The President. Yes, it is because the period that I was referring to—back then, we had not entered into that decline that seemed to come upon us in later years. I don't know what caused it, but it did happen. But, no, we had curriculums that were stiff and required courses that you had to take. And you find out later that they were very beneficial—in taking them. And also, we had a great feeling about our land. Maybe part of it was because I'm old enough that that was in the immediate postwar era, post-World War I. [*Laughter*]

Liberal Arts

Q. Mr. President, the Secretary of Education's decision to place emphasis on math and science programs took away the strength of the arts program. How can we achieve a balance between the subjects?

The President. Well, again, I could refer to the past. I think you can have that balance—depends a lot on you. But that principal that I spoke about that had such an imprint on my life—because not only the principal and the English teacher but by virtue of that particular class—he also directed all the school plays and the drama club plays. And many years later in Hollywood I once said to myself, I haven't come across a director yet that was better than B.J. Frazier. So, it's there, and it's possible. And I don't think they detract at all. Even though I spoke and asked some of you if you were thinking about being teachers, let me say another word of encouragement. If you're still pondering and you haven't thought of what you want to be in life, don't get discouraged. I graduated from college unable to say exactly what I wanted to do with my life. So, the broadest exposure you get to all of these subjects—the compulsory ones, math and science and all the rest—all of them are going to help you one day answer that question for yourself.

Homelessness

Q. Mr. President, do you feel the problem of the homeless is one the Federal Government should tackle? And if not, how can it be resolved?

The President. Frankly, I think the problem of the homeless, like so many other problems, actually belongs at the local com-

munity and State level, with the Federal Government ready to help in any way that it might be able to in which something would come properly under the Federal Government's province. But you see, that's one of the great secrets of this country that we tended to forget for about 40 or 50 years. As we started going into more and more Federal domination and Federal interference in local programs, including education, we played a hand in the decline of education by thinking that in addition to doing some added funding we could use that as an excuse for the Federal Government trying to run the public schools. The schools for a long time have been run in this country best when they're closer to the people in the communities where the parents and the students are. And so, I have to say that in this particular thing that you've raised, the problem of the homeless, is best known by the people in the community where it's taking place—why they're homeless, can see them as individuals instead of a mass of faceless people that the Federal Government just thinks of in numbers. So, as I say, if there is a way in which the Federal Government's help can be used, whether it is in financing or what else, actually the administering of this belongs right back where the people are.

Q. Thank you, Mr. President.

U.S. Involvement in Panama

Q. Mr. President, because of the recent uprising in Panama, will it be necessary to resume U.S. military control in Panama for the safety of the Canal Zone?

The President. No, we're going to abide by the Canal treaty, and we're not going to be the big Colossus of the North once again coming into our smaller neighbors' places of living and business and trying to guide and direct them. They have a very difficult problem there. We think that they're moving toward solving it with the reaction of the people to the man that has caused so much of this problem. We want to be of help in any way we can, and so we've helped them in that regard in the economic restraints that we've put down there so that there can be pressure focused on this particular individual. But, no, there's no danger of us coming in with our power and muscle and saying this is the way it has to be.

President's Future Plans

Q. Mr. President, what are you going to do when you step down from the Presidential spotlight?

The President. Hmmm. [*Laughter*] I'm a little old to be a teacher, in spite of what I said earlier. [*Laughter*] Well, I tell you, I do have some ambitions for when that time comes. There are some things that I would like to crusade for that I could not crusade for while I'm President—some I could but some others that I couldn't—because it would seem as if I was selfishly doing it in my own interest.

For example, I would like to start calling to the attention of the people of this country the flaw in the 22d amendment to the Constitution, passed a few years ago, which says a President can only serve two terms. Now let me explain something here. The reason I have to wait is because, as I say, I couldn't dare open my mouth and do this in my own behalf while I'm here, and I don't want to. But what I want to call to the people's attention is: The President is the only one in government who is elected by all the people, and it seems to me that that constitutional amendment, which was born out of vengeance against Franklin Delano Roosevelt—I think that that amendment is an infringement on the democratic rights of the American people, who should be allowed to vote for who they want as long as they want and—[*applause*].

And also, I'm going to crusade for some other things, too, like the line-item veto and the—[*laughter*]—43 Governors had it. I had it when I was Governor of California. I line-item vetoed out of budgets 943 times in 8 years and was never overridden once. Now, in California, the legislature takes a two-thirds majority to pass the budget, and then they send it to the Governor. And it only takes two-thirds of a majority to override a veto. But when I found spending things in that budget and I vetoed them 943 times, you could not get the same two-thirds majority in the legislature when that was exposed all by itself out there—not buried in the whole budget—you couldn't get two-thirds of them to override my veto, not

once.

So, those are some things that I'd like to go out and get on what I call the mashed-potato circuit and—speaking and—because when you, the people—[*laughter*]—no, when you arouse yourself and—[*laughter*]—when you decide that there's something you want done, I think your two Congressmen over here—[*laughter*]—will tell you, they hear in Washington.

Invitation to Attend Graduation

Q. Mr. President, will you honor Oakton High School with your presence at graduation?

The President. There was some laughter between you and me before, and I didn't hear your question. [*Laughter*]

Q. Will you honor us with your presence at graduation?

The President. Was I—what? [*Laughter*]

Q. Will you honor us with your presence at graduation in June?

The President. Oh! [*Laughter*] Well, I don't know whether that's possible. You know, you've heard that the President is the most powerful man in the country, if not the world and so forth. I have to tell you something: Every day they hand me a piece of paper that tells me what I'm going to be doing that day—[*laughter*]—for every 15 minutes of that day. And long before graduation time, I'm sure that my schedule—first, I suppose, I should ask you the date of your graduation.

Q. June 15th.

The President. June 15th. It is very possible that I will be in Canada at the economic summit that is held every June, every year. But I won't know that for a while yet.

Audience Members. Awww!

The President. If it were possible, I would be most happy to join you.

Q. Okay, thank you.

Mr. Spillane. Mr. President, on behalf of the entire staff of this school and all of us in Fairfax County, we want you to have this remembrance of your visit here: a schoolhouse that plays "School Days." And we very much appreciate the opportunity to listen to you today, and thank you.

The President. Well, thank you very much.

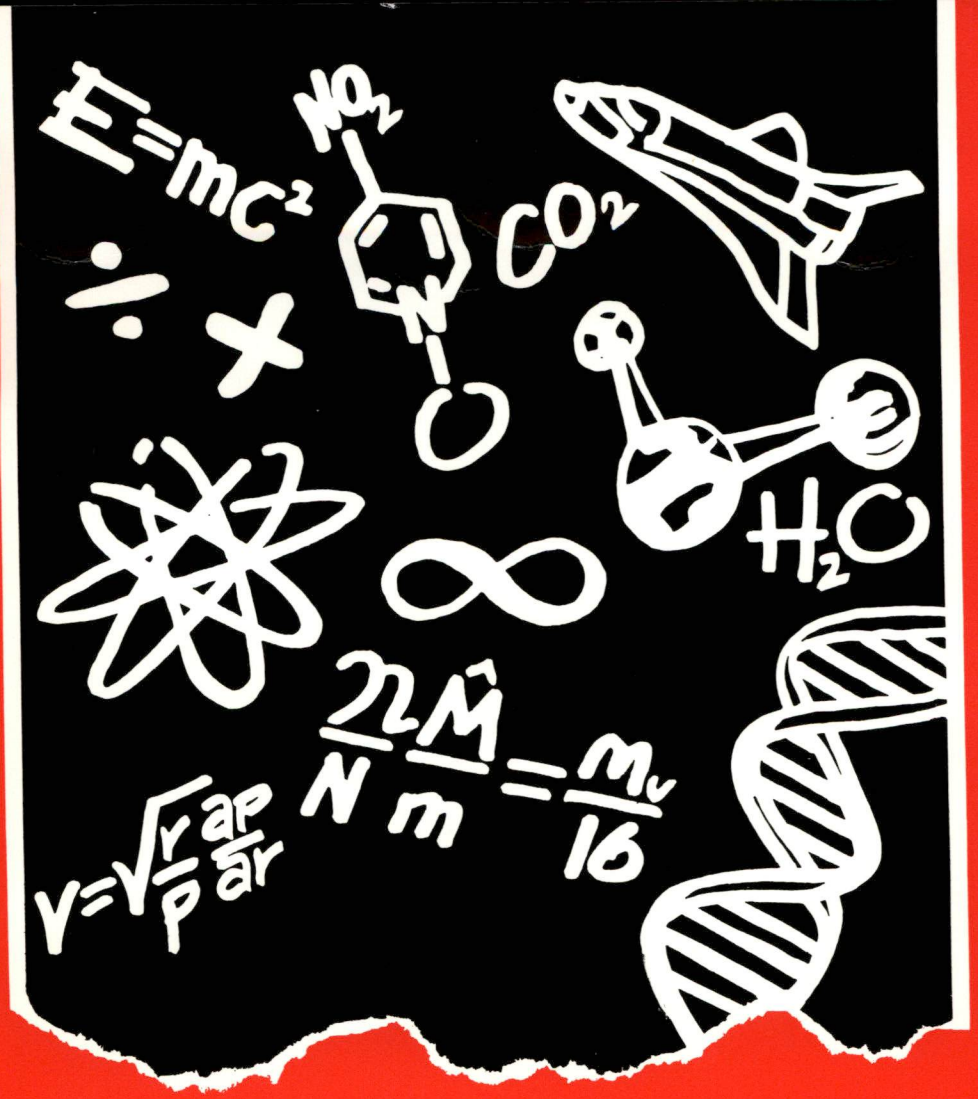
Note: The President spoke at 2 p.m. in the Oakton High School auditorium. Ms. Laura Thomas, principal of the school, introduced the question-and-answer session.

Nomination of David O'Neal To Be an Assistant Secretary of Labor
March 25, 1988

The President today announced his intention to nominate David O'Neal to be Assistant Secretary of Labor for Mine Safety and Health. He will succeed David A. Zegeer.

Since 1985 Mr. O'Neal has served as Deputy Director of the Bureau of Land Management for the Department of the Interior in Washington, DC. Prior to this he was president of O'Neal Inns, Ltd., 1984–1986, president of O'Neal Printing, 1982–1984, and executive vice president of Aviation Systems International, 1981–1982.

Mr. O'Neal graduated from St. Louis College of Pharmacy (B.S., 1962). He served in the U.S. Marine Corps, 1956–1959. He was born January 24, 1937, in Belleville, IL. Mr. O'Neal has two children and resides in Arlington, VA.



By the Year 2000
First in The World

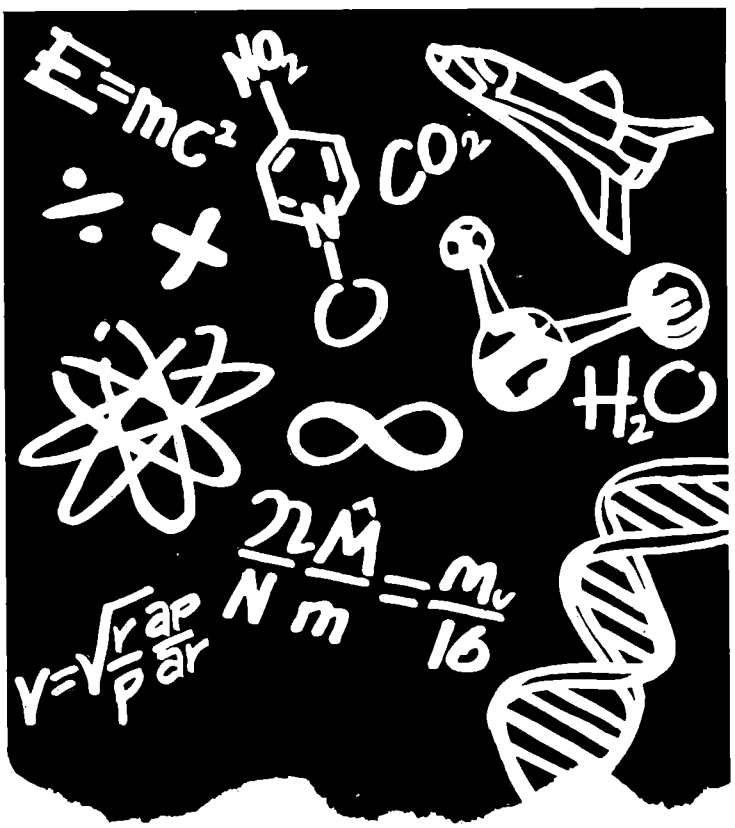
Report of the FCCSET
Committee on Education
and Human Resources

January 1992

FY 1993

BY THE YEAR 2000:
FIRST IN THE WORLD

REPORT OF
THE FCCSET COMMITTEE ON
EDUCATION AND HUMAN RESOURCES



FY 1993
BUDGET SUMMARY

January 1992

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

MEMBERS OF CONGRESS:

I am pleased to forward with this letter "By the Year 2000: First in the World," a report by the Committee on Education and Human Resources (CEHR) of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), to supplement the President's Fiscal Year 1993 Budget. This report, the second in a series begun in 1991, describes the FY 1993 Presidential Initiative in Mathematics and Science Education.

The CEHR effort is consistent with the President's leadership and commitment in the field of education and supports the goals and objectives of the AMERICA 2000 national education strategy. This report builds on the pioneering work done by the Committee last year, and further develops our understanding of how the Federal Government can contribute to meeting the National Education Goals for mathematics and science education. The emphasis in the program is on precollege education, but strong support is given to efforts to sustain and improve undergraduate and graduate education as well. In FY 1993 we see increased emphasis on public science literacy to strengthen the understanding and knowledge necessary for an informed citizenry.

Through the FCCSET process, and in close cooperation with the Office of Management and Budget, the Committee on Education and Human Resources has achieved a significant increase in the level of interagency coordination in mathematics and science education. The CEHR is also building close ties with the other Presidential Initiatives to ensure that advances, for example, in high performance computing and communications are fully recognized in terms of their potential to improve the delivery of education at all levels.

I want to take this opportunity to salute the superb leadership of Admiral James D. Watkins, who has been Chairman of the Committee on Education and Human Resources since it was established. He and the Co-Vice Chairmen, David Kearns and Luther Williams, have led the coordination and integration of the interagency strategy for this Initiative. They and their interagency committee members, associates, and staff are all to be commended for the excellent work that is manifest in both the Initiative and the report.

In the near future, Admiral Richard H. Truly will succeed Admiral Watkins as Chairman of the Committee on Education and Human Resources. Admiral Truly has already demonstrated an outstanding commitment to the improvement of mathematics and science education in the United States. I am certain that he and the other members of the Committee will continue the tradition begun by Admiral Watkins in advancing the Federal role in making the United States first in the world in mathematics and science achievement.

D. Allan Bromley
Director

The Secretary of Energy
Washington, DC 20585

January 20, 1992

Dr. D. Allan Bromley
Assistant to the President
for Science and Technology
Office of Science and Technology Policy
Old Executive Office Building
Washington, D.C. 20506

Dear Allan:

It is with great pleasure that I submit to you the FY 1993 Budget Summary report of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) Committee on Education and Human Resources (CEHR).

Under the President's leadership, our Nation is engaged in an unprecedented period of education reform. The Committee on Education and Human Resources has the unique opportunity to coordinate the work of Federal agencies in mathematics and science education as part of this effort. This year's report outlines the Committee's accomplishments, describes budget proposals indicative of the President's support for education reform, and our priorities and new initiatives for the future, as well as our commitment to AMERICA 2000.

I take tremendous pride in what this Committee has initiated and accomplished in only eighteen months. Surely, these efforts will assist the Nation in achieving the National Education Goals, and I envision the future of American education bettered by the hard work and dedication of all our Committee and Working Group Members.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)
Chairman, FCCSET CEHR

Federal Coordinating Council for Science, Engineering, and Technology

Committee on Education and Human Resources

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APPENDIX

LIST OF COMMON ACRONYMS

ADAMHA ..... Alcohol, Drug Abuse, and Mental Health Administration
CEHR ..... Committee on Education and Human Resources
DOC ..... U.S. Department of Commerce
DOD ..... U.S. Department of Defense
DOE ..... U.S. Department of Energy
DOI ..... U.S. Department of the Interior
DOJ ..... U.S. Department of Justice
DOL ..... U.S. Department of Labor
DOT ..... U.S. Department of Transportation
ED ..... U.S. Department of Education
EPA ..... U.S. Environmental Protection Agency
FCCSET ..... Federal Coordinating Council for Science, Engineering, and Technology
HHS ..... U.S. Department of Health and Human Services
HUD ..... U.S. Department of Housing and Urban Development
NASA ..... National Aeronautics and Space Administration
NIST ..... National Institute of Standards and Technology
NOAA ..... National Oceanic and Atmospheric Administration
NSF ..... National Science Foundation
OMB ..... Office of Management and Budget
OPD ..... Office of Policy Development
OSTP ..... Office of Science and Technology Policy
SI ..... Smithsonian Institution
USDA ..... U.S. Department of Agriculture
VA ..... U.S. Department of Veterans Affairs

TABLES AND FIGURES

EXECUTIVE SUMMARY

THE CONTINUING CHALLENGE

For decades, commissions, committees and task forces have called for the improvement of American mathematics and science education. Citing challenges to U.S. economic strength and well-being from increasing international competition, they have brought to our attention the awareness that while America's scientific enterprise is currently the best in the world, American science education is not.

While it is true that many American children receive an excellent education, it is also true that far too many do not. Evidence of this can be seen in:

- Poor American student performance relative to their peers in other countries;
- Inadequate college and university preparation and lack of current scientific knowledge and effective pedagogical techniques among too many American teachers;
- Insufficient numbers of students pursuing the education and training necessary for critical scientific and technical jobs;
- Continued underrepresentation of women, minorities and persons with disabilities in science courses and careers; and
- Low levels of science literacy among the American public.

THE FEDERAL ROLE

The Federal Government is both a user and patron of a large portion of America's scientific and technical workforce and, as such, has both short-term and long-term interest in the successful preparation of that workforce. Education in the United States is a partnership that includes: parents; educators; Federal, State and local governments; business and industry; professional associations; community-based organizations; and volunteers from all walks of life. Approximately 94% of precollege funding comes from States and local communities. However, with its 6%, the Federal Government can play a leadership role by mobilizing national support for reform, establishing national goals, initiating model reform efforts and bringing to bear the great scientific and technical resources managed by Federal agencies. In mathematics, science and technology education, the Federal Coordinating Council for Science, Engineering, and Technology's Committee on Education and Human Resources (CEHR) provides the essential coordination between Federal agencies to carry out this work.

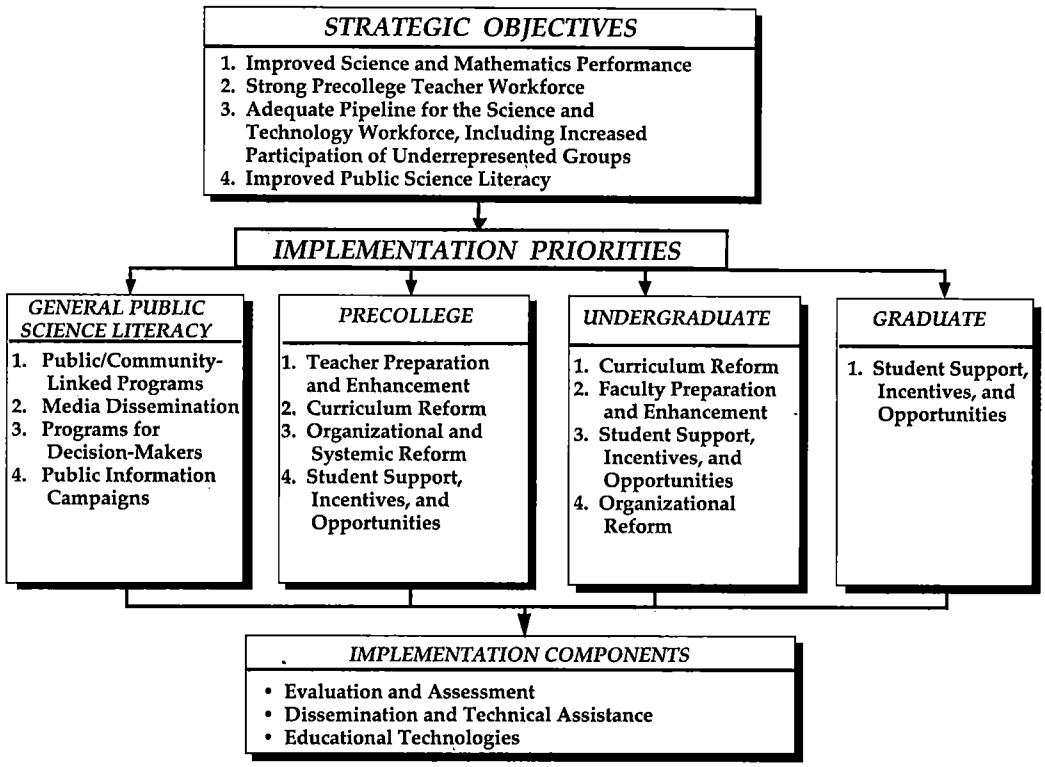
AMERICA 2000

In April 1991, President Bush announced a comprehensive national strategy for achieving the six National Education Goals, including the improvement of mathematics, science and technology education. Entitled "AMERICA 2000," the strategy identifies four tracks for accomplishing national education reform:

- making better and more accountable schools for today's students;
- creating a new generation of American schools for tomorrow's students;
- becoming a "nation of students;" and
- making communities places where learning can happen.

Because the focal point of AMERICA 2000 is the National Education Goals, and because CEHR priorities are based on those goals as they relate to mathematics, science and technology, the Committee has a well-established programmatic and budgetary framework *[Figure I]* to help further the goals and objectives of AMERICA 2000.

Figure I:
FY 1993 Federal Math/Science Education Priority Framework



The Committee also recognizes that experiences from precollege through graduate education are interdependent. CEHR recognizes its responsibilities in higher education as well, as reflected in its priorities shown above.

FY 1993 BUDGET SUMMARY

The President's FY 1993 budget proposes the investment of $2.1 billion in mathematics, science, technology, and science literacy education programs. This is an increase of $138 million (or 7%) over the FY 92 enacted levels for the programs and a $626 million (or 43%) increase over FY 90 enacted levels *[Figure II]*.

Figure II:
FY 1990-1993 Growth by Education Level (dollars in millions)

	FY 1990	FY 1991	FY 1992	FY 1993	Increase FY 90-93	% Increase FY 90-93
Grand Totals	**$ 1466.07**	**$ 1712.70**	**$ 1954.74**	**$ 2092.23**	**$ 626.16**	**43%**
Precollege	343.66	514.65	650.71	767.95	424.28	123%
Undergraduate	383.95	413.90	444.25	480.77	96.82	25%
Graduate	738.46	784.15	768.88	750.20	11.74	2%
Science Literacy	N/A	N/A	90.89	93.32		

The FY 1993 increases are consistent with the priorities established by CEHR to achieve the mathematics- and science-related National Education Goals through AMERICA 2000. They are distributed as follows:

Precollege: *$768 million,* 37% of the CEHR budget.
Increase over FY 1992: $117 million (+18%)
Increase over FY 1990: $424 million (+123%)

Undergraduate: *$481 million,* 23% of the CEHR budget.
Increase over FY 1992: $37 million (+8%)
Increase over FY 1990: $97 million (+25%)

Graduate: *$750 million,* 36% of the CEHR budget.
Increase over FY 1992: -$19 million (-2%)
Increase over FY 1990: $12 million (+2%)

Public Science Literacy: *$93 million,* 5% of the CEHR budget.
Increase over FY 1992: $2 million (3%)[1]

NEW INITIATIVES

For FY 1993, there are three major new initiatives in mathematics and science education that build on the concept of increased utilization of Federal government assets:

Mathematics and Science Teacher Enhancement. The most important near-term action to improve mathematics and science education is to enhance the content knowledge, pedagogic skills, and enthusiasm of teachers already in the workforce. The President's budget proposes an expanded program for the training of these teachers, a part of which includes the use of Federal laboratory personnel and facilities. The initiative builds significantly on existing programs and will ultimately provide in-depth, up-to-date training for all of America's precollege mathematics and science teachers. As an initial step, this budget proposes to double the number of teachers receiving Federal assistance for high-intensity training in FY 1993 to roughly 45,000. In addition, the initiative supports shorter-term training opportunities for approximately 725,000 teachers. Thus, this initiative will reach almost half of the Nation's precollege math and science teachers. The initiative will also have the objective of preparing teachers to teach mathematics and science curricula that are tied to world class standards, when those standards are in place.

This initiative will involve the complementary efforts of three Federal agencies. The National Science Foundation (NSF) will award merit-based grants to university investigators to operate regional teacher training programs. The U.S. Department of Education (ED) will support model projects in selected school districts designed to employ secondary school math and science teachers to train elementary and middle school teachers in those districts. ED will also modify its Eisenhower State Grant program to increase the number of teachers receiving intensive training. The U.S. Department of Energy (DOE) will lead an interagency effort to implement teacher training and research programs based at Federal laboratories, in collaboration with universities, State and local educational agencies, businesses and industry.

Educational Technologies. A major objective of the AMERICA 2000 strategy is to establish national electronic networks that link all American schools with other sites where learning occurs. In support

[1]New budget category; comparative data only available for FY 1992.

of this objective, the Administration proposes to accelerate implementation of classroom educational technology programs.

Mathematics and science teaching is ideally suited for the use of electronic dissemination technologies. Through technology, outstanding scientists can be brought into thousands of classrooms at once and students can interact in real-time with astronauts on National Aeronautics and Space Administration (NASA) missions, for example. By linking researchers, educators, and students, in this way, current information in science and technology can be shared in a timely manner, providing an invaluable supplement to standard curricula. Federal agencies, including U.S. Department of Defense (DOD), NASA, DOE, and NSF, are presently engaged in two major activities in this area: (1) the use of long-distance electronic communication technologies (e.g., satellite broadcasting, fiber optics and computer networks) that provide technical training and disseminate scientific and technical information developed to support agency programs and missions; (2) both ED, through its STAR Schools Program, and NSF support distance learning programs, with emphasis on rural school systems that have limited access to educational resources.

In 1992, CEHR will hold a major conference to review the merits of existing and proposed educational technologies. Those technologies demonstrating the most promise for revolutionizing classroom instruction will be selected for support under special, fast-track demonstration programs.

Computers and Scientific Equipment. Studies have shown that student performance in mathematics and science is enhanced by access to and experience with computers and various scientific equipment. Yet, in times of tight budgets, investment in these types of equipment is often deferred. This initiative proposes a new effort to make available Federal excess and surplus personal computers and scientific equipment to local school systems. In future years, the amount of excess personal computers and related equipment is expected to rise due to the turnover of current Federal assets.

CEHR ACCOMPLISHMENTS

In its first eighteen months, the Committee on Education and Human Resources has achieved several of its goals. In preparation for the previous year's budget submission, CEHR:

- Prepared the first comprehensive Federal budget crosscut of mathematics, science and technology education programs at the precollege, undergraduate and graduate levels;

- Published the first inventory of mathematics, science and technology programs in 16 Federal agencies.

In preparation for the FY 1993 budget submission, CEHR:

- Established programmatic and budgetary priorities for the continuation of existing programs and the initiation of new ones;

- Reviewed the math and science education programs of every agency for merit, impact, cost, and alliances with other Federal agencies or the private sector; during this process, information was exchanged on agency objectives, as well as the characteristics of major science and mathematics education activities;

- Added the new science literacy category to the program inventory in order to better emphasize and coordinate programs that reach a broader public;

- Convened four program-based task forces to draft government-wide program priorities and milestones for precollege, undergraduate, graduate and science literacy education levels; and

- Encouraged member agencies to assist with the implementation of AMERICA 2000 reform efforts at the State and local levels.

In the coming year, the Committee will begin the development of a multi-year Strategic Plan, will convene Task Forces on Technical Training and Federal Schools, and will conduct national meetings on educational technologies and effective science literacy education strategies.

THE PURPOSE OF THE REPORT

In the balance of this report, the Committee will:

- Summarize the President's FY 1993 budget request for mathematics, science and technology education in support of AMERICA 2000;

- Provide budget highlights by agency;

- Provide background on the Committee and its role in implementing the AMERICA 2000 education strategy; and

- Outline the Committee's future course of work.

INTRODUCTION: AMERICA 2000 AND CEHR

AMERICA 2000: THE NATIONAL EDUCATION STRATEGY

Our country has a fundamental stake in the educational abilities and accomplishments of its youth and in the workforce preparedness and scientific literacy of its adults. As a result of the President's Education Summit with the Governors in 1989, the adoption of the National Education Goals in 1990, and the President's launching of AMERICA 2000 in 1991, the Federal Government has begun to contribute greatly as a catalyst and coordinator of educational reform, both in terms of policy discussions and funding of reform, e.g., NSF's Statewide Systemic Initiative. CEHR's work is to coordinate these Federal efforts as they apply to the established goal of being first in the world in mathematics and science student achievement and to foster a greater understanding of mathematics and science throughout the Nation.

President Bush presenting AMERICA 2000 to the U.S. Chamber of Commerce, January 14, 1992.

Three National Education Goals specifically target achievement, competency, and literacy in the sciences and mathematics. These are Goals 3, 4, and 5, as shown in Figure 1. The four tracks of AMERICA 2000, the strategy designed to achieve the National Education Goals, are cited in Figure 2. The CEHR strategic framework (Figure 3) was designed to address The National Education Goals along all four tracks of AMERICA 2000.

Figure 1: The National Education Goals

By the Year 2000:

1. All children in America will start school ready to learn.
2. The high school graduation rate will increase to at least 90 percent.
3. *American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.*
4. *U.S. students will be first in the world in science and mathematics achievement.*
5. *Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.*
6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

Figure 2: AMERICA 2000: The National Education Strategy

The AMERICA 2000 strategy has four tracks that will be pursued simultaneously:

Track 1 **For today's students,** we must radically improve today's schools by making all 110,000 of them better and more accountable for results.

Track 2 **For tomorrow's students,** we must invent new schools to meet the demands of a new century with a New Generation of American Schools, bringing at least 535 of them into existence by 1996 and thousands by decade's end.

Track 3 **For those of us already out of school and in the workforce,** we must keep learning if we are to live and work successfully in today's world. A "Nation at Risk" must become a "Nation of Students."

Track 4 **For schools to succeed,** we must look beyond our classrooms to our communities and families. Schools will never be much better than the commitment of their communities. Each of our communities must become a place where learning can happen.

Further information about AMERICA 2000 and copies of the AMERICA 2000 brochure can be obtained by contacting the U.S. Department of Education AMERICA 2000 Hotline, 1-800-USA-LEARN (1-800-872-5327). In the Washington, D.C. area, the number is 202-401-2000.

CEHR MISSION AND ACCOMPLISHMENTS

The White House Office of Science and Technology Policy (OSTP), through the Federal Coordinating Council for Science, Engineering, and Technology, established the Committee on Education and Human Resources as a direct result of the 1989 Education Summit. The Committee is tasked to develop a Federal strategy for science, mathematics, engineering and technical education that will ensure U.S. world leadership in science and technology; ensure the Nation's access to a highly trained workforce; and increase the scientific literacy of our citizens.

Secretary Lamar Alexander speaking with students during an AMERICA 2000 event.

The Committee is chartered to develop and update a long-range Federal strategy for scientific and technical education in the U.S.; to identify and define planning priorities that will lead to effective use of Federal resources for meeting related goals and objectives; to review and evaluate existing programs; and to improve planning, coordination, and communication among member agencies.

The Committee began working in May 1990, and in January 1991 produced ***By the Year 2000: First In the World***, which included both the first Federal crosscut budget in mathematics and science education as well as the first descriptive listing of programs administered by sixteen participating agencies.

CEHR's 1991 Accomplishments

This budget submission represents the second integrated and comprehensive plan for science, mathematics, engineering, and technology education. For FY 1993, the base for the CEHR budget was broadened to include the Smithsonian Institution. Throughout the past year, two other agencies, the U.S. Department of Labor (DOL) and the U.S. Department of Housing and Urban Development (HUD), contributed to the development of the Federal program plan although their own science and mathematics education activities are not presented as part of this budget. [2]

Over the past year, the Committee has made significant progress in developing broad-based expertise and understanding of science education programs across Federal agencies; in working out common program guidelines that will strengthen agency programs and facilitate evaluation of the

overall Federal science and mathematics education effort; in identifying collaborative programs that will capitalize on agency strengths; and in developing innovative strategies for strengthening the Federal role in education.

During 1991, major CEHR accomplishments included:

- **Extensive review of Federal agency programs:** A review was held of the math and science education programs of every agency for merit, impact, cost, and alliances with other Federal agencies or the private sector. Information on agency objectives, as well as the characteristics of major science and mathematics education activities, was exchanged.

[2]FCCSET CEHR classifies Federal education programs into three categories that reflect their degree of focus on science, mathematics, engineering, and technology education (see "Definitions" in the Appendix). The budget includes only "Category 1" programs—those legislated by Congress for science, mathematics, engineering, and technology education or expressly managed by agencies as an education-related activity. Over the past year, four agencies (DOL, HUD, DOT, and VA) reviewed their education programs and determined that they fell outside the Category 1 definition.

- **Establishment of four CEHR Task Forces:** Precollege, undergraduate, graduate, and science literacy task forces met to develop program guidelines and strategies that will guide CEHR program development in the future as well as the FY 1993 budget process. Task Force leaders were: NASA for precollege, DOD for undergraduate, the U.S. Department of Agriculture (USDA) for graduate, and the U.S. Department of Health and Human Services (HHS) for public science literacy. Reports by the Task Forces detailed Federal program activities, refined objectives and priorities, established milestones, and identified future issues.

"Weather & Me" Program from Smithsonian Institution's National Science Resource Center.

- **Expansion of the CEHR program base to include public science literacy:** The Task Force on Public Science Literacy developed an operating definition for activities designed to improve the public understanding of science and technology; defined a set of program categories for use in the budget process; established a baseline inventory of Federal programs; and developed milestones and recommendations for future activity.

- **Development of the FY 1993 budget submission:** Under the leadership of NSF, the strategic framework was reviewed and updated; the program inventory was recalculated to establish a new base, and inventory definitions were revised and strengthened; Federal planning priorities were developed to guide budget development; four interagency program groups were convened to address special cross-agency issues that undergird the entire structure (evaluation, dissemination, educational technologies, and minority program activities); and recommendations for joint strategies in critical areas were developed.

The most important achievement of CEHR over the past year has been the maturing of the interagency process through which the application of the CEHR education framework in setting agency priorities and guiding program development has occurred. The most notable examples were HHS, which ran a three-day conference structured around the CEHR strategy to set its own education agenda, particularly in the area of science literacy; and NASA, which is developing a program totally compatible with the CEHR strategy.

CEHR ROLE IN AMERICA 2000

To implement the mathematics and science components of AMERICA 2000 requires a coherent Federal strategy, one that addresses the entire educational continuum. The CEHR education strategy therefore examines the pre-college, undergraduate, and graduate education levels, and science literacy. These four components build and rely on one another and cannot be developed in isolation. The strategy is predicated on the need to maintain the integrity and strength of programs in each area since all play a critical role in making American students first in the world in science and mathematics achievement.

Each component offers unique challenges and requires that attention be focused on different priorities so as to effect appropriate changes in the system. Throughout all levels and priorities, the strategy places emphasis on increasing the participation of groups underrepresented in the sciences and mathematics.

CEHR has considered each priority through both budget and programmatic lenses. Thus, the proposed strategy consists of recommendations for funding increases that track areas of most critical need, that provide for expansion of activities under effective existing programs, and that create, where appropriate, new programs to address deficiencies. The strategy includes suggestions for changes that will increase the impact of programs without additional cost to the taxpayers. One example of this is ED's proposed requirement that 25 percent of Eisenhower State funds go toward intensive teacher training rather than funding short term workshops exclusively.

Students at Coleman Elementary, DOE's AMERICA 2000 adopted school, seal their agreement with Secretary of Energy, James D. Watkins.

BENEFITS OF A COORDINATED FEDERAL STRATEGY

There are many advantages to establishing and maintaining a coordinated Federal strategy for improving mathematics and science education.

An Integrated Federal Response

The challenges addressed by the National Education Goals cut across the missions of many Federal agencies, and so should the solutions. The CEHR strategy enables member agencies and other policy makers to take a global view of the entire Federal response to mathematics and science achievement and to revise priorities or emphases in their own agencies in a manner resulting in a coordinated Federal effort to meet the National Education Goals.

In Summer Science Institutes at Federal laboratories, teachers work with scientists to develop curriculum materials on environmental sciences, electricity and magnetism, chemistry, biology, and physics.

Baseline Information on Federal Activities
In February 1991, CEHR made available to the public a government-wide inventory that, for the first time, listed all Federal mathematics, science and engineering education programs and activities across agencies. In addition, the inventory included previously unavailable information for policy makers about mathematics and science education activities at levels below the traditional agency budget line items, as well as including volunteer and outreach activities. Such inventories will serve as valuable guides for teachers, parents, school administrators and others on the front lines of educational reform who would like access to Federal expertise and resources.

Reducing Overlap and Filling Gaps
With expanded information about education missions and programs of Federal agencies, the President, the Congress, and Federal agencies can take action to reduce overlap and fill gaps. Executive and Legislative Branch policy makers are becoming more aware of promising programs and activities, including those that have not been highly visible in the past because they fall below the budget line-item level.

More Effective Use of Resources
Shared knowledge about the range and purposes of Federal programs can result in more effective use of Federal resources. Because many programs in the inventory are cooperative ventures with other government and private sector entities, CEHR collaboration can open up new avenues for cost sharing and greater leveraging of Federal funds.

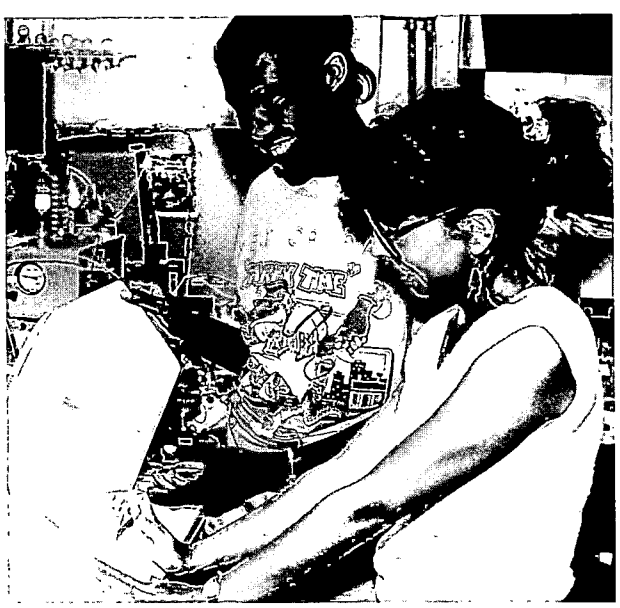
More Access to Federal Scientific Equipment and Facilities
Federal laboratories and other scientific facilities can become centers for student and teacher learning outside the classroom, offering hands-on opportunities and exposure not available in traditional school settings. Surplus equipment from Federal facilities can be made more available to the precollege educational system. More on this may be found in the "New Initiatives" section, on page 16.

Replication of Successful Programs
Greater cooperation among Federal agencies will open new channels for disseminating information about exemplary programs and will expand opportunities for replicating successful programs.

Interagency Networks
Through its work, CEHR has established a network of mathematics and science education professionals across all Federal agencies who can serve as valuable sources of information and

coordination. Participation in CEHR will enable member agencies to evaluate their efforts against the unified Federal strategy. Opportunities are also increased for cooperative interagency efforts and joint funding of projects.

Better Evaluation and Dissemination
The inventory of Federal programs identified by CEHR has been uniformly reviewed by the Committee, which will help ensure that funds are spent appropriately and effectively. The most successful programs can then be disseminated through the interagency network to the public.



Metro D.C. teachers participating in the ADAMHA "Summer in the Lab" program.

Greater Public Support
A coordinated interagency budget and a comprehensive program inventory provide valuable information to the public about Federal programs, facilities, expertise and resources for mathematics and science education. Greater public awareness and access to Federal resources can translate into increased public commitment and community action.

Coordination with the States and Public Sector
By coordinating its own efforts in mathematics and science education, the Federal government can provide State and local governments and the private sector with easier and greater access to Federal programs and other resources, such as personnel, educational materials, facilities and equipment. By working together in this way, national progress toward achieving the National Education Goals by the year 2000 can be made most rapidly.

A Stronger Teaching Force
Within precollege education, CEHR has placed first priority on enhancing the skills of teachers. Through innovative CEHR programs, and by utilizing resources such as Federal laboratories, teachers will gain greater exposure to cutting-edge science, update their knowledge, and become better prepared to educate students. More students in the science pipeline will form a larger pool of future mathematics and science teachers. The teaching force can also be expanded by offering encouragement and incentives for mid-career professionals from science and technical disciplines to enter teaching through innovative programs in alternative certification. In addition, Federal scientific and technical experts can assist teachers by serving as classroom resource persons.

Better Educated Students
Through the CEHR action strategy, Federal resources will be better utilized to motivate students to stay in the mathematics, science and engineering pipeline. CEHR coordination will increase student exposure to the latest scientific

and technical developments through hands-on activities that link curriculum with the real world of science and through contact with Federal experts and facilities. Targeted Federal programs will help students complete high school with competency in mathematics and science and encourage them to enter college to receive further education in these subjects.

A More Scientifically Literate Public
Increased coordination will better enable Federal agencies to provide science and technology information to the public and increase public understanding. A more scientifically literate population will be better prepared to make well-informed decisions on scientific and technical issues confronting themselves and the Nation.

FUTURE CEHR ACTIVITIES

The future activities of CEHR will combine ongoing programs that reflect the planning accomplished during the past year and the new initiatives described above. Last year's work will manifest itself in new programs designed by the four task forces, and those programs will represent both the efforts of individual agencies and the interagency collaborations that the FCCSET process fosters.

Over the next year, CEHR will establish a Strategic Planning Working Group, to be chaired by ED, and Task Forces on Federal Schools, chaired by the U.S. Department of the Interior (DOI), and on Technical Education, to be chaired by DOL.

Strategic Planning Working Group. This Working Group will fully integrate the work of CEHR with the AMERICA 2000 education strategy. The Working Group will also lay out a multi-year strategic plan for CEHR that will address each education level.

Task Force on Technical Education. National Education Goal #5 and Track 3 of AMERICA 2000 refer to the need for students and adults alike to be prepared for productive employment and possess the knowledge and skills needed to compete in a global economy. Over the next year, DOL will take lead responsibility for expanding the program inventory to include technical education. This program area will be a difficult one to address. The Committee has to determine relevant fields and occupations that qualify as technical training under CEHR; decide on minimal skill levels and activities appropriate for consideration; identify a range of program activities that depict Federal involvement in this area; and develop a baseline.

Task Force on Federal Schools. DOI will lead the CEHR agencies in an examination of how the Federal government is teaching mathematics and science in the school systems that it operates, including the Bureau of Indian Affairs school system and the Department of Defense Dependents Schools system.

National Conference on Educational Technologies. CEHR will sponsor a national conference on educational technologies, described more fully in the "New Initiatives" section on page 15.

New Program Directory. In 1992, the Committee will begin work on a State-by-State directory of all Federal programs in mathematics, science and technology education, to provide better information on Federal programs available at the local and national level to parents, teachers and administrators.

CEHR FY 1993 BUDGET SUMMARY

FY 1993 BUDGET REQUEST

The President's FY 1993 budget proposes the investment of $2.1 billion in mathematics, science, engineering, technology, and science literacy education programs, along priority lines indicated in Figure 3. This represents an increase of $138 million or 7% over the FY 1992 enacted levels for these programs (Figure 4: FY 1992-93 Growth by Education Level), and a $626 million, or 43% increase over their FY 1990 enacted levels (Figure 10).

The FY 1993 request is distributed by education level as shown in Figure 5: $768 million for precollege (37% of the total request), $481 million for undergraduate (23%), $750 million for graduate (36%), and $93 million for science literacy (4%).

For FY 1992-93, in accordance with the policy guidance provided by the National Education Goals and AMERICA 2000, the single largest requested increase is in the precollege area

Figure 3:
FY 1993 Federal Math/Science Education Priority Framework

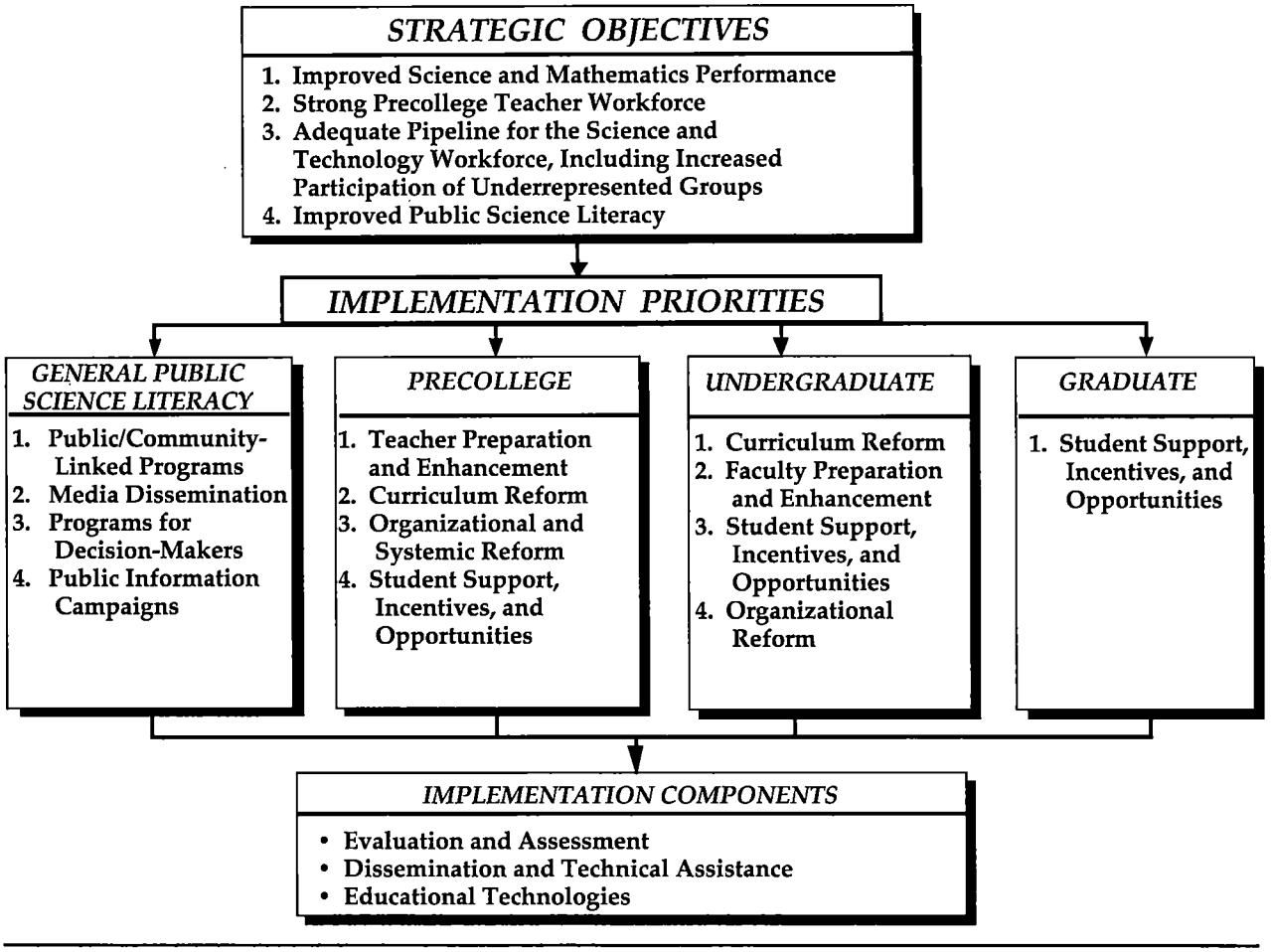


Figure 4:
FY 1992-1993 Growth by Education Level (dollars in millions)

	FY 1992	FY 1993	Increase FY 92-93	% Increase FY 92-93
Grand Totals	**$ 1954.74**	**$ 2092.23**	**$ 137.50**	**7%**
Precollege	650.71	767.95	117.23	18%
Undergraduate	444.25	480.77	36.52	8%
Graduate	768.88	750.20	-18.68	-2%
Science Literacy	90.89	93.32	2.43	3%

(+18%), followed by undergraduate (+8%) and science literacy (+3%), followed by a decrease in graduate (-2%) education, due to add-ons in the FY 1992 budget that are not requested again in FY 1993.

Figure 6: FY 1993 Budget Request by Agency and Major Program Area and Figures 7 and 8: FY 1992-1993 Growth, show the President's FY 1993 request for CEHR programs in detail by agency, educational level and major program area. Complete budget matrices for FY 1993 (Figure 24) and FY 1992 (Figure 25) can be found in the Appendix.

Figure 5:
FY 1993 Request by Education Level

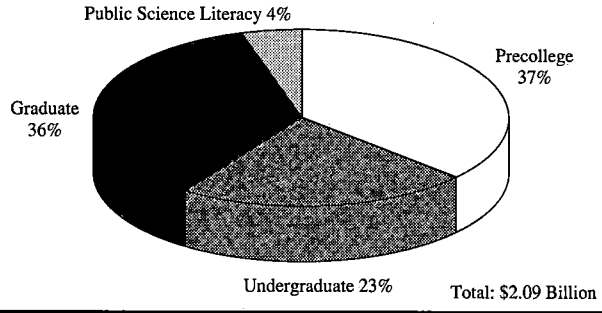


Figure 7:
FY 1992-1993 Growth by Agency (dollars in millions)

	FY 1992	FY 1993	Increase	% Increase
TOTAL	**$1954.74**	**$2,092.23**	**$137.50**	**7.03%**
USDA	20.36	22.65	2.29	11.26%
DOC	3.51	3.68	.18	4.99%
DOD	415.97	415.97	0.00	0.00%
ED	293.83	392.53	98.70	33.59%
DOE	108.56	113.21	4.65	4.28%
DHHS	411.94	416.45	4.51	1.09%
DOI	82.73	88.43	5.70	6.89%
SI	9.96	10.04	.08	0.84%
NSF	521.80	537.20	15.40	2.95%
NASA	77.79	82.27	4.48	5.76%
EPA	8.30	9.80	1.50	18.07%

CEHR FY 1993 Budget Request by Agency and Major Program Area

MAJOR CATEGORIES	Total Request	USDA	DOC	DOD	ED	DOE	HHS	DOI	SI	NSF	NASA	EPA
GRAND TOTAL	2092.23	22.65	3.68	415.97	392.53	113.21	416.45	88.43	10.04	537.20	82.27	9.80
Precollege Total	767.95	0.72		4.97	371.20	32.39	21.84	25.30	0.63	286.20	16.70	8.00
Teacher Preparation/Enhancement	436.51			0.63	286.50	16.84	5.19	2.00	0.33	114.80	7.92	2.30
Curriculum Development	91.58				2.70	4.51	2.54	6.90	0.22	67.70	5.00	2.01
Comprehensive/Organizational Reform	104.05				20.00	3.58	4.14			74.00	0.29	2.04
Student Incentives	68.08	0.72		4.34	20.00	6.55	9.97	14.71		11.00	0.58	0.21
Program Evaluation and Studies, and Dissemination	58.74				42.00	0.57		0.15	0.08	13.80	0.70	1.44
Other	8.99					0.34		1.54		4.90	2.22	
Undergraduate Total	480.77	13.50		176.20	21.00	56.87	25.00	8.72		146.30	32.38	0.80
Faculty Preparation/Enhancement	49.22					11.52	0.08	1.82		30.80	5.00	
Curriculum Development	97.71			38.90		3.22	0.16	1.03		52.90	1.50	
Comprehensive/Organizational Reform	90.44	13.50		6.80	6.00		22.52	0.43		28.80	12.39	
Student Incentives	190.05			100.50	15.00	25.05	2.24	5.33		28.80	12.33	0.80
Other, includes education technologies, program evaluation and dissemination	53.35			30.00		17.08		0.11		5.00	1.16	
Graduate Total	750.20	8.43	3.68	234.80		19.62	364.01	11.07	0.50	73.90	33.19	1.00
Predoctoral Fellowships	99.54		0.30	16.70		8.21	5.64	0.10	0.09	52.40	15.30	0.80
Predoctoral Traineeships	160.81	4.00		3.90		0.55	128.99	10.42		8.40	4.35	0.20
Postdoctoral Fellowships	98.70		3.38	10.50		6.43	51.23	0.55	0.41	13.10	13.10	
Postdoctoral Traineeships	155.62	4.43				0.50	150.69					
Other	235.53			203.70		3.93	27.46				0.44	
Public Science Literacy Total	93.32				0.33	4.34	5.60	43.34	8.91	30.80		
Education Programs for Decision Makers	5.10					0.35		3.35		1.40		
Media Dissemination	22.09					1.13	1.21	3.25		16.50		
Public/Community-Linked Dissemination	59.50					1.34	3.23	33.12	8.91	12.90		
Public Information Campaigns	6.33				0.33	1.42	0.96	3.62				
Public Science Literacy Evaluation	0.30					0.10	0.20					

Figure 6: FY 1993 Budget Request by Agency and Major Program Area

Figure 8:
FY 1992–1993 Growth by Program Element (dollars in millions)

Major Categories/Elements	FY 1992 Baseline	FY 1993 Total Request	Change	Percent Change
Grand Total	**$ 1,954.74**	**$ 2,092.23**	**$ 137.49**	**7%**
Precollege	$ 650.71	$ 767.95	$ 117.24	18%
Precollege Teacher Preparation and Enhancement	382.56	436.51	53.95	14%
Precollege Curriculum and Materials Development	83.35	91.58	8.23	10%
A. Precollege Instructional Materials Development	61.65	65.87	4.22	7%
B. Precollege Educational Technologies	21.71	25.71	4.00	18%
Precollege Student Incentives and Opportunities	46.48	68.08	21.60	46%
A. Precollege Direct Student Support	27.80	63.46	35.66	128%
B. Bridging to Postsecondary	18.68	4.62	-14.06	-75%
Precollege Organizational Reform	60.34	72.65	12.31	20%
Precollege Comprehensive or Multifaceted Programs	27.35	31.40	4.05	15%
Precollege Dissemination and Technical Assistance	17.63	17.84	0.21	1%
Precollege Program Evaluation and Studies	24.10	40.90	16.80	70%
A. Precollege Evaluation and Assessment	11.10	10.90	-0.20	-2%
B. Precollege Data Collection and Studies				
C. Precollege National Standards and Testing	13.00	30.00	17.00	131%
Precollege Other Total	8.89	8.99	0.10	1%
Undergraduate	$ 444.25	$ 480.77	$ 36.52	8%
Undergraduate Program Evaluation and Studies	3.60	3.90	0.30	8%
A. Undergraduate Evaluation and Assessment	3.60	3.90	0.30	8%
B. Undergraduate Data Collection and Studies				
Undergraduate Educational Technology	31.00	31.00	0.00	0%
Undergraduate Dissemination and Technical Assistance				
Faculty Preparation and Enhancement	36.66	49.22	12.56	34%
Undergraduate Curriculum and Materials Enhancement	103.45	97.71	-5.74	-6%
A. Undergraduate Course and Curriculum	80.28	74.59	-5.69	-7%
B. Undergraduate Laboratory Equipment	23.17	23.12	-0.05	0%
Undergraduate Student Incentives and Opportunities	168.55	190.05	21.50	13%
A. Undergraduate Financial Assistance	131.63	134.65	3.02	2%
B. Undergraduate Research Experiences and Coops	36.67	50.05	13.38	36%
C. Bridging to Four Year or Graduate School	0.25	5.35	5.10	2040%
Undergraduate Organizational and Operational Reform	25.90	32.40	6.50	25%
Undergraduate Comprehensive or Multifaceted Programs	56.30	58.04	1.74	3%
Undergraduate Other Total	18.80	18.46	-0.34	-2%

Figure 8:
FY 1992–1993 Growth by Program Element (continued)

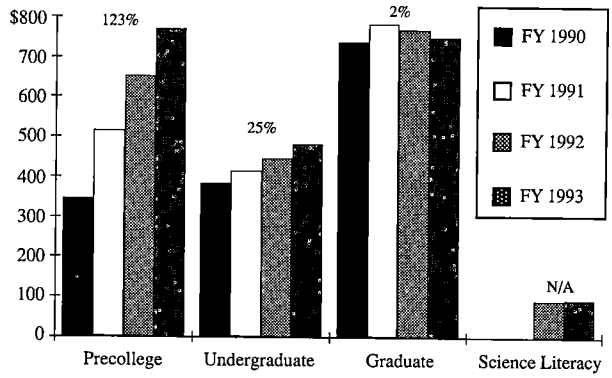
Major Categories/Elements	FY 1992 Baseline	FY 1993 Total Request	Change	Percent Change
Graduate	$ 768.88	$ 750.20	$ -18.68	-2%
Predoctoral Fellowships	99.77	99.54	-0.23	0%
Predoctoral Traineeships	180.28	160.81	-19.47	-11%
Postdoctoral Fellowships	98.79	98.70	-0.09	0%
Postdoctoral Traineeships	154.79	155.62	0.83	1%
Graduate Program Evaluation and Studies	0.10	0.10	0.00	0%
A. Graduate Evaluation and Assessment	0.10	0.10	0.00	0%
B. Graduate Data Collection and Studies				
Graduate Other Total	235.16	235.43	0.27	0%
Public Science Literacy	$ 90.89	$ 93.32	$ 2.43	3%
Education Programs for Decision Makers	1.74	5.10	3.36	193%
Media Dissemination	21.73	22.09	0.36	2%
Public or Community Linked Dissemination	56.90	59.50	2.60	5%
Public Information Campaigns	6.95	6.33	-0.62	-9%
Public Science Literacy Program Evaluation and Studies	3.57	0.30	-3.27	-92%
A. Public Science Literacy Evaluation and Assessment	3.57	0.30	-3.27	-92%
B. Public Science Literacy Data Collection and Studies				
Public Science Literacy Other Total				

Footnote:
Undergraduate programs, separated by two- and four-year levels, can be found in the Appendix as *Figure 26.*

FY 1990-93 GROWTH

The FY 1993 request marks the third year of significant increases for Federal programs in mathematics, science, engineering, and technology education. As shown in Figures 9-11, the multi-agency growth over the three year period, FY 1990-1993, has been a substantial $626 million, a 43% increase. The most notable increase has been in the precollege area (+123%), in conformance with Presidential support for the National Education Goals and AMERICA 2000.

Figure 10:
FY 1990-1993 Growth by Education Level



Dollars in Millions

Figure 9:
FY 1990-1993 Growth by Education Level (dollars in millions)

	FY 1990	FY 1991	FY 1992	FY 1993	Increase FY 90-93	% Increase FY 90-93
Grand Totals	**$ 1466.07**	**$ 1712.70**	**$ 1954.74**	**$ 2092.23**	**$ 626.16**	**43%**
Precollege	343.66	514.65	650.71	767.95	424.28	123%
Undergraduate	383.95	413.90	444.25	480.77	96.82	25%
Graduate	738.46	784.15	768.88	750.20	11.74	2%
Science Literacy	N/A	N/A	90.89	93.32		

Figure 11:
FY 1990-1993 Growth by Agency (dollars in millions)

	FY 1990	FY 1991	FY 1992	FY 1993	Increase FY 90-93	% Increase FY 90-93
Total Request	**$ 1466.08**	**$ 1715.70**	**$ 1954.74**	**$ 2092.23**	**$ 626.15**	**43%**
USDA	19.60	19.95	20.36	22.65	3.05	16%
DOC (1)	7.31	7.26	3.51	3.68	-3.63	-50%
DOD	416.04	416.04	415.97	415.97	-0.07	
ED	162.90	235.00	293.83	392.53	229.63	141%
DOE	42.04	64.14	108.56	113.21	71.17	169%
DHHS	435.42	486.33	411.94	416.45	-18.97	-4%
DOI	27.14	40.58	82.73	88.43	61.29	226%
SI	N/A	N/A	9.96	10.04	N/A	N/A
NSF	277.78	371.66	521.80	537.20	259.42	93%
NASA	50.91	68.15	77.79	82.27	31.36	62%
EPA	1.00	6.59	8.30	9.80	8.80	880%

(1) All years contain core NOAA and NIST postdoctoral program funding. FY 1990 - 91 figures also contain miscellaneous discretionary funding which may become available in FY 1992.

NEW INITIATIVES

For FY 1993, there are three major new initiatives in mathematics and science education that build on the concept of increased utilization of Federal government assets:

Mathematics and Science Teacher Enhancement. The most important near-term action to improve mathematics and science education is to enhance the content knowledge and enthusiasm of the teachers. The President's budget proposes an improved program for the training of these teachers, a part of which includes the use of Federal laboratory personnel and facilities. The initiative will ultimately provide in-depth, up-to-date training for all of America's precollege mathematics and science teachers. As an initial step, this budget proposes to double the number of teachers receiving Federal assistance for high-intensity training in FY 1993 to roughly 45,000. In addition, the initiative supports shorter-term training opportunities to approximately 725,000 teachers. Thus, this initiative will reach almost half of the Nation's precollege math and science teachers. The initiative will also have the objective of preparing teachers to teach mathematics and science curricula that are tied to world class standards, when those standards are in place.

This initiative will involve the complementary efforts of three Federal agencies. NSF will award merit-based grants to university investigators to operate regional teacher training programs. ED will support model projects in selected school districts designed to employ secondary school math and science teachers to train elementary and middle school teachers in those districts. ED will also modify its Eisenhower State Grant Program to increase the number of teachers receiving intensive training. DOE will lead an interagency effort to implement teacher training and research programs based at Federal laboratories, in collaboration with universities, State and local educational agencies, and corporations.

Educational Technologies. A major objective of the AMERICA 2000 strategy is to establish national electronic networks that link all

Figure 12:
Mathematics and Science Teachers Trained (in thousands)

	1989	1990	1991	1992	1993
Intensive[1]	11	14	20	23	45
Short-term[2]	550	530	690	746	725
Total Teacher-days	770	800	1084	1206	1627

[1] Intensive training is defined as 20 or more days.
[2] Short-term training includes a variety of activities, including attendance at seminars of one-day or less duration. These activities are primarily supported through the ED's Eisenhower program.

American schools and other sites where learning occurs. In support of this objective, the Administration proposes to focus attention to accelerate implementation of educational technology programs in classrooms.

Math and science teaching is ideally suited for the use of electronic dissemination technologies. By linking researchers, educators, and students, current information in science and technology can be shared in a timely manner, providing an invaluable supplement to standard curricula. Federal agencies, including DOD, NASA, DOE, and NSF, are presently engaged in two major activities in this area: (1) the use of long-distance electronic communication technologies (e.g., satellite broadcasting, fiber optics and computer networks) that provide technical training and disseminate scientific and technical information developed to support agency programs and mission; (2) both ED, through its STAR Schools Program, and NSF support distance learning programs, with emphasis on rural school systems that have limited access to educational resources.

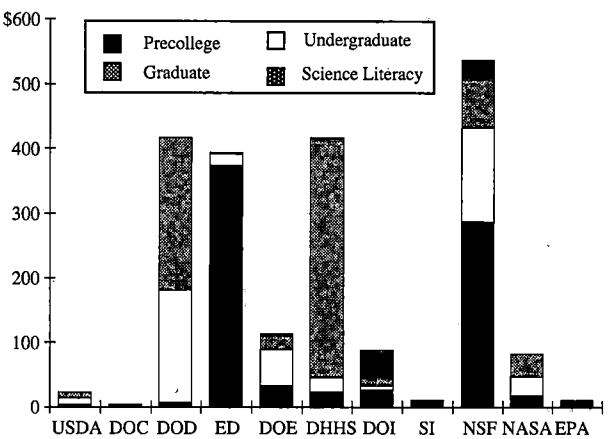
In 1992, CEHR will hold a major conference to review the merits of existing and proposed educational technologies. Those technologies demonstrating the most promise for revolutionizing classroom instruction will be selected for support under special fast-track demonstration programs.

Computers and Scientific Equipment. Studies have shown that student performance in mathematics and science is enhanced by access to and experience with computers and various scientific equipment. Yet, in times of tight budgets, investment in these types of equipment is often deferred. The budget proposes a new effort to make available excess Federal personal computers and equipment to local school systems. In future years, the amount of excess personal computers and related equipment is expected to rise due to the turnover of current Federal assets.

AGENCY ROLES

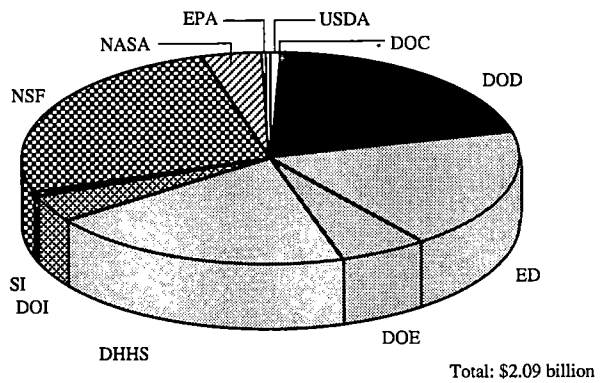
The roles that CEHR agencies play in mathematics and science education vary by their size, mission, and educational level emphasis. Figure 13 indicates total spending by agency, while Figure 14 shows a comparison by overall budget size.

Figure 13:
FY 1993 Agency Roles — Requests by Education Level



Agency roles vary significantly, as shown in Figure 13. NSF and ED, for example, represent 44% of the total FY 1993 funding request. While ED focuses on the precollege arena, NSF covers higher education as well. HHS and DOD

Figure 14:
FY 1993 Budget Request by Agency



Total: $2.09 billion

represent a combined 40% of total funding—both are heavily focused on graduate education, and DOD provides the single highest level of funding for undergraduate education. Mission agencies make unique contributions in subject areas related to their science and technology mission. Figure 15 shows FY 1993 budget highlights by agency.

Figure 15:
Budget Highlights by Agency

National Science Foundation: In FY 1993, through budget increments and reprogramming, NSF will aggresively pursue its strategy for systemic reform by forging alliances and partnerships among all major players in the education system. NSF programs will support exemplary projects for reform of State precollege educational delivery systems; school system- or district-wide teacher enhancement activities; and teacher preparation collaboratives that link schools of education and disciplinary departments within universities. In addition, NSF will intensify efforts to increase the quality and quantity of science, mathematics and engineering education of minority students through systemic aproaches that promise to affect permanent change in the delivery of education at both the precollege and undergraduate levels.

Department of Education: For FY 1993, ED is proposing a $36 million teacher enhancement program conducted by expert math/science secondary school teachers who will provide intensive inservice training to all elementary and middle school teachers in a district. Additionally, two new math and science bilingual education competition grant programs are proposed to: (1) provide bilingual instruction focusing on mathematics and science to limited English proficient students and (2) provide bilingual education teacher training with a particular emphasis on math and science.

Department of Energy: In FY 1993, DOE will sponsor the Second Annual National Science Bowl for high school students involving 32 teams selected from regional competitions involving more than 12,000 students. Other activities include expanded support for rural-urban partnerships with DOE laboratories, like that of the Oak Ridge National Laboratory and the Oak Ridge School District, and expanded alliances between DOE laboratories/facilities and minority colleges and universities to encourage students to pursue careers in environmental sciences and waste management. DOE will also lead a new interagency teacher enhancement initiative that utilizes Federal laboratories.

Department of Defense: DOD's efforts to ensure the Nation's future supply of trained scientists and engineers are supported through its graduate and post-doctoral grant programs. Undergraduate programs are available to

improve education performance and teaching methods for skill training programs for DOD personnel.

Department of Commerce: DOC has expanded the number of fellows participating in its National Institute of Standards and Technology/ National Research Council Postdoctoral Research Associateships Program from 25 to 30.

National Aeronautics and Space Administration: In FY 1993, NASA will complete the implementation of the National Space Grant College and Fellowship Program encompassing 50 state consortia of colleges, universities, nonprofit organizations, industry and state and local governments, a total of approximately 350 institutions. A significant component of this program is educational outreach at the precollege level, emphasizing CEHR priorities. In 1993, NASA will implement the primary phase of the National Scholars Program, as well as expand its teacher enhancement programs. From a management perspective, NASA will also implement its long range Education Strategic Plan.

Department of Interior: In FY 1993, over 3 million teachers and students will be reached through the National Park Service's "Parks as Classrooms" program which builds science activities around park resources. 2,000 teachers will participate in U.S. Geological Survey (USGS) Joint Education Initiative, or "JeDI," workshops during FY 1993. These workshops will teach them how to use CD-ROM technology to improve their science classes in high schools. 100 college professors will improve their teaching skills during short term USGS faculty preparation programs. Over 500 students will work as summer interns for the U.S. Fish and Wildlife Service during FY 1993 improving their science skills and becoming exposed to science and its principles through fish and wildlife issues.

Department of Health and Human Services : In FY 1993, HHS will extend its efforts to improve public understanding of the life sciences by expanding its speakers bureau, developing exhibits, and supporting national media programs on a variety of biomedical research issues. HHS will continue to encourage and support direct involvement of its scientists in precollege classrooms and with precollege teachers in a variety of settings. For 1993, as part of its new Science Teaching Enhancement Award Program, HHS will implement a Pre-Service Teacher Training Program targeted at future K-12 teachers.

Environmental Protection Agency: In FY 1993, EPA will provide $ 4.1 million in grants to post-secondary institutions to operate an environmental training and education program as well as grants to support local, State and non-profit environmental education. The EPA Office of Environmental Education (OEE) is developing a clearinghouse of information on environmental education materials which will eventually include information from all Federal agencies. An internship program for college students and fellowship program for in-service teachers to improve training of environmental professionals will be established.

Department of Agriculture: With its commitment to advance minority participation, USDA has more than doubled the funding for the 1890 Institution Teaching and Research Capacity

Building Grants Program since it was launched in FY 1990. USDA has expanded its Graduate Fellowship Grants Program to reduce shortages of scientific expertise and is stimulating curricula revitalization and faculty development through its Higher Education Challenge Grants Program.

Smithsonian Institution: As part of its ongoing commitment to education, the SI intends in FY 1993 to strengthen and expand its programs in education, especially at the precollege level. Major efforts include: 1) Leadership Institutes (National Science Resource Center), which prepare educators from across the country to spearhead efforts to improve elementary science education in their school districts; 2) Project Star (Smithsonian Astrophysical Observatory), which develops innovative high school teaching materials in astronomy and trains master teachers to implement courses based on the materials; and 3) Education Outreach (National Air and Space Museum), which develops and disseminates materials to assist teachers, especially in fostering school children's interest in science.

PRECOLLEGE PROGRAMS

The education level that receives the highest priority in the overall CEHR strategy is precollege. Formal elementary and secondary education provides the basic skills upon which future knowledge is predicated. For many individuals, it represents the entire sum of school experience. If we are to enhance significantly the learning and productive capabilities of our citizens, substantial investments, as well as institutional and policy changes must be made at this level. Recognizing this, the President's FY 1993 budget includes a total request of $768 million for precollege mathematics and science education programs, more than one-third of the CEHR total request. This represents a $117 million or 18% increase over FY 1992, and a $424 million or 123% increase over FY 1990. The CEHR strategy at the precollege level is structured around four program elements. In descending order of priority, these are: teacher preparation and enhancement, curriculum reform, organizational reform, and student incentives and opportunities. The first three program areas, especially, are interrelated. To be successful in any one area, progress and change must exhibit requisite complementary changes in the others. Within program areas, agency roles vary considerably. For example, ED provides nearly two-thirds the support for teacher enhancement, mainly through the Eisenhower State Grants program; NSF is the dominant player in both curriculum and organization reform, 74% and 98% respectively. Mission agencies (HHS, DOE, NASA, DOD and DOI) support nearly 60% of student incentive activities.

Figure 16:
Precollege Program Elements

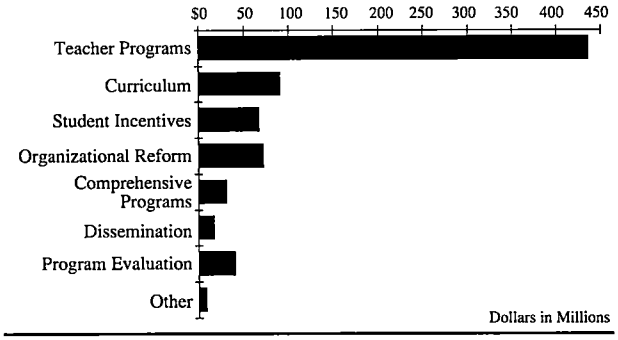
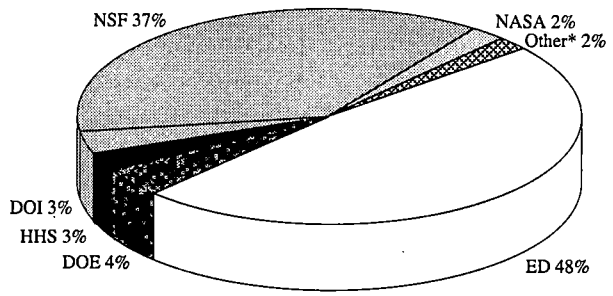
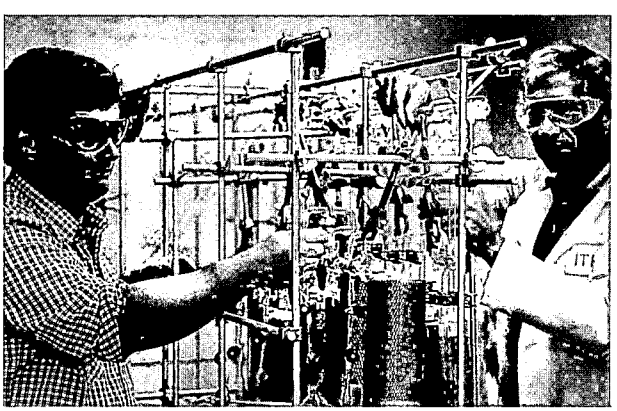


Figure 17:
Precollege Budget by Agency



AMERICA 2000 proposes the development of national standards for what students should know and what they should be able to do. Standards will help link Federal efforts with each other, ensuring that all are working toward the goal of making American students first in the world in mathematics and science achievement by the year 2000.

Standards for achievement at the precollege level in mathematics have been established by the National Council of Teachers of Mathematics (NCTM); they are currently being developed in science by the National Academy of Sciences (NAS). To measure student performance relative to these standards, AMERICA 2000 proposes the development of a new voluntary set of American Achievement Tests. When the appropriate standards and tests are in place, they will help guide both the content and method of teaching in Federally supported programs, as well as define expected performance levels for students.



Dr. William E. Bechtold (left) of the ITRI Staff and Mr. Jack K. Witles, STEP Teacher at Portales High School, Portales, New Mexico.

Teacher Preparation and Enhancement. If America is to become first in the world in mathematics and science achievement by the year 2000, our teachers must be able to deliver a world class education to their students. Those whose prior training in mathematics and science is out of date must have an opportunity to update their knowledge; and those whose preservice education was inadequate will require intensive retraining. To ensure that our teachers have the capability to deliver this world class education, the CEHR strategy has the following objectives:

- Tying Federal teacher training efforts to world class standards as established in mathematics by NCTM and in science by NAS, and certified by the National Education Goals Panel.

- Improving the quality of, and increasing the intensity, of teacher training experiences. Research indicates that longer and more intensive experiences are more likely to have a significant effect on a teacher's subsequent instruction and ability.

- Doubling the number of teachers receiving intensive training between 1992 and 1993.

To accomplish these objectives, the President is proposing to expand or modify existing programs and to undertake several new initiatives.

- Teacher enhancement activities within the National Science Foundation will continue to provide intensive, multi-year training to individual teachers. Emphasis will be placed on creating master teachers who return to their schools to mentor colleagues, broadly improving teacher competence, student outcomes, and the learning environment. State- and district-wide enhancement efforts are also being pursued. In FY 1993, NSF will support the intensive training of nearly 25,000 teachers. Also in FY 1993, NSF will begin development of teacher preparation collaboratives that will combine the expertise of schools of education and disciplinary departments within universities.

- The Department of Education will hold a $36 million competition, under Eisenhower National Programs, which will support model projects, operating within a whole school district, that employ experienced and expert secondary school teachers of math and science to train elementary and middle school teachers in an integrated mathematics and science curriculum. Approximately 7,200 teachers would receive intensive training in 1993.

- ED will also require the higher education portion of the Eisenhower State Grants program to be used for intensive teacher training activities of 20 days or more. This would allow 12,400 teachers to receive intensive training in 1993.

- A new interagency initiative will expand the use of the vast resources of the Federal laboratory system, exposing teachers to cutting-edge science in specific content areas and showing them how to incorporate what they have learned into the classroom. In FY 1993, 1,800 teachers would receive intensive training.

Summer institute for Chicago science and mathematics teachers at Fermi National Accelerator Laboratory.

With the new initiatives and the expansion or modification of current programs, the Federal Government will provide intensive training of at least four weeks to approximately 45,100 teachers in 1993, up from 23,400 in 1992.

Provisions are also being made to ensure that new cadres of teachers enter the workforce

properly prepared. In CEHR, both ED and NSF will play lead roles in the preparation of teachers by working with universities to improve pre-service training programs. However, mission agencies will also have a role; for example, HHS plans to establish a program targeted at providing opportunities for future K-12 science teachers in the Nation's leading biomedical and behavioral research laboratories. Over time, all preservice programs will be linked to inservice training activities. ED will also encourage States to reform certification requirements so that the requirements relate to world class standards as they are developed. The President's AMERICA 2000 strategy addresses this issue by proposing legislation to support States to encourage more qualified individuals to enter the teaching profession by expanding alternative routes to teacher certification.

Parents and children learn computer basics together in a program sponsored by Brookhaven National Laboratory.

Curriculum Reform. Teaching that significantly improves student performance depends on the availability of quality curricula. New standards for science and mathematics, new technologies, and recent research findings on teaching and learning need to be incorporated into curricula in an ongoing process. In order to ensure that the curricula at the local level reflect new standards, the ED, through its Eisenhower National Programs, is sponsoring the development of State curriculum frameworks that will guide district curricula.

NSF is supporting development of new instructional materials that will meet national standards in science and mathematics and permit the delivery of curricula within various State frameworks. NSF is also providing for development and implementation of new technology tools in instruction; for the development of new assessment instruments and new ways of reporting student learning; and for the evaluation and dissemination of NSF-funded materials.

The CEHR strategy supports development and dissemination of high-quality, comprehensive, and integrated curriculum models that span the precollege continuum. The strategy calls for evaluation and support of major national curriculum projects such as National Council of Teachers of Mathematics and Mathematical Sciences Education Board's implementation of the mathematics standards, the American Association for the Advancement of Science's *Project 2061*, and the National Science Teacher Association's *Scope, Sequence, and Coordination* project. In addition, there must be evaluation, and widespread dissemination of

existing high quality curricula materials, and when necessary, development of new curricula.

To promote both efficiency and effectiveness of the Federal investment in curricula projects, the CEHR strategy calls for an integration of mission agency resources with those of NSF and ED. Subject-specific instructional materials produced by mission agencies can be very effective in augmenting basic curricula. These materials will be developed in conjunction with education and disciplinary experts designing general science and mathematics curriculum. They will be evaluated to ensure accuracy of underlying scientific and mathematical principles, as well as relevance and utility for classroom instruction. As an example, HHS is developing exhibits for schools and libraries that will provide precise illustrative information on the biological basis of drug abuse.

Children participate in astronaut training activities while at NASA Marshall Discovery Lab in Huntsville, Alabama.

Federal teacher training activities must integrate the standards-related curricula into their programs. This will allow increasing numbers of teachers to gain excellent and up-to-date content knowledge. NSF presently integrates NSF-developed curricula into its teacher enhancement program, while ED's new Eisenhower National Programs initiative will use curricula related to world class standards and tied to State and local curriculum frameworks.

Organizational and Systemic Reform. The education system must be responsive to the attempts being made to improve the teacher workforce and curricula. Retraining individual teachers or introducing new textbooks will have little impact if the educational system is not prepared to absorb these improvements on a broad scale basis. The Federal government is now taking a more active role in catalyzing organizational and systemic reform by promoting the adoption of new standards and by helping State and local officials implement the strategies that they propose to improve the delivery of science and mathematics education . The CEHR strategy calls for a substantial increase in support for organizational and systemic reform activities that address all aspects of education.

Federal support for State and local reform activities will primarily be carried out through the efforts of NSF and ED. At NSF, support will continue for the Statewide Systemic Initiative Program that engages entire State structures (legislative, education, industry, etc.) in catalyzing reform for science and mathematics education. By 1994, reform activities in 30-34 States will be supported under this program. ED is supporting the creation of New American Schools, which reflect one of the AMERICA 2000 tracks.

There is a role in reform for all agencies, however. To effect significant, permanent change, all major Federal programs in a particular State should be brought to bear in support of the reforms in a coordinated fashion.

No matter how young, children enjoy exploring their world through hands-on science.

Sharing of expertise and building effective communications linkages within and among these States will accelerate the pace of improvement.

Student Incentives. Interest in science and mathematics must be captured at a young age and sustained throughout the precollege years to ensure a sufficient pool of scientists and science teachers. This interest is also critical to ensuring a scientifically literate public. Federal resources, including laboratories, national parks, and museums, can provide student experiences that enhance classroom curricula. The mission agencies play a critical role in this area. Topics such as space, health, nuclear energy, global warming, and the environment immediately capture and stimulate students' imaginations.

Programs supported in these areas will be designed in conjunction with teachers and administrators so as to relate them to classroom curricula. All agencies' teacher preparation and enhancement programs will include information on how the teacher can utilize resources in the community to provide valuable student enrichment experiences.

Program Evaluation, Studies, and Dissemination. To ensure accountability and program effectiveness, NSF has initiated a comprehensive evaluation of all its major education and human resource programs to be conducted over a five-year cycle. As part of the CEHR strategy, NSF will coordinate the evaluation of corresponding initiatives in other Federal agencies.

UNDERGRADUATE PROGRAMS

The total requested for undergraduate programs in FY 1993 is $481 million, representing an increase of $37 million (+8%) over FY 1992, and $97 million (+25%) over FY 1990 levels. This represents 23% of the total CEHR request. Figure 18 indicates the relative spending on undergraduate program elements, and Figure 19 shows undergraduate spending by agency.

Figure 18: Undergraduate Program Elements

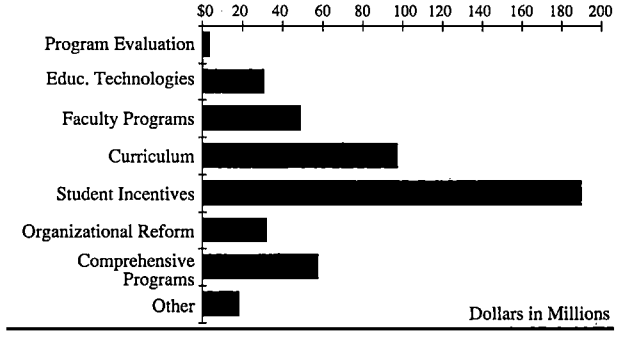
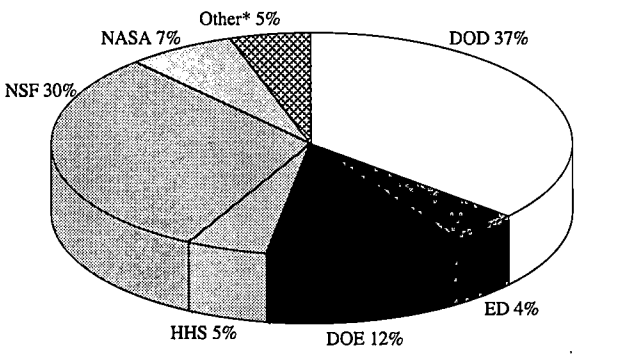


Figure 19:
Undergraduate Budget by Agency



*USDA, DOI, SI, EPA

Total: $481 million

Undergraduate education develops the next generation of scientists and engineers; provides valuable training for precollege science and mathematics teachers; and generally improves the literacy of non-majors in issues and principles related to science and technology. A primary concern at this level, similar to that with precollege, is that of stimulating interest and increasing the retention of students in these fields. Retention is an especially serious problem for underrepresented minorities at this education level.

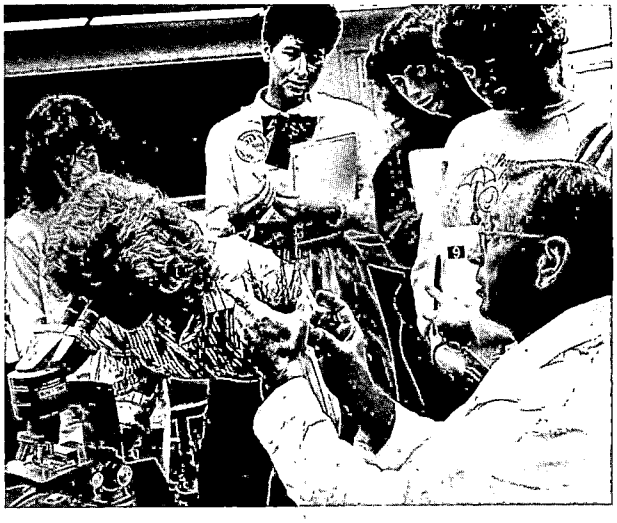
The CEHR strategy places this education level second to precollege as a focal point for improvement. Undergraduate science, mathematics, and engineering education consists of four program elements, in descending order of priority: curriculum reform, faculty preparation and enhancement, organizational reform, and student incentives and opportunities. As at the precollege level, these four program areas are interrelated and must be developed in concert. In the FY 1993 request, the single largest component (almost 40%) of the undergraduate request provides financial and research opportunities for students (Figure 18). DOD and NSF represent nearly two-thirds of all funding in this program area: DOD is the major contributor to direct student support through its Reserve Officer Training Corps (ROTC) Program; NSF provides the majority of support for curriculum, faculty development, and operational reform. While USDA funding is modest, a major proportion of its education resources go to these activities.

Two-year colleges continue to represent a concern for CEHR. Nearly one-half of all college students (including a significant number of minorities) take their introductory college mathematics and science classes at these institutions. These institutions are critical to the

At the University of Illinois, students explore ways of learning calculus through interactive computer software. Computers individualize instruction by allowing students to master material at their own speed. Undergraduate curriculum projects at NSF integrate changes in course content and teaching methods with innovative applications of new technologies.

production of highly qualified technicians for the changing workforce and they often have unique needs and require different programmatic approaches than those used for four-year institutions. Direct support for two-year colleges continues to remain at roughly 3% of the undergraduate total. However, increasing emphasis is being placed on involving these institutions in existing programs and encouraging consortia between these institutions and four-year colleges and universities.

Curriculum Reform. In the scientific world, which is characterized by nothing less than a knowledge explosion, theories are constantly changing, knowledge bases evolving, and new discoveries are being made that, taken in combination, can relegate even recently published textbooks to obsolescence. Undergraduate curricula are seriously outdated, failing to give students access to current information in their fields. Moreover, reform of the precollege curricula requires revision of lower-division courses to ensure an appropriate interface of the two education levels.



Northeast Missouri State University strengthened its biology curriculum and laboratory facilities with support from the NSF Instructional Laboratory Imrovement Program. Above, students join their professor in exploring techniques to determine the chemical composition of fungi which play a critical role in the decomposition of organic matter and its subsequent recycling.

The CEHR strategy places heavy emphasis on improvement of courses at the introductory level. Introductory courses are gateways for advanced study in science, mathematics, and engineering, as well as the principal source of instruction in scientific and technical fields for precollege science and mathematics teachers. Interesting and accessible courses at the lower division are also instrumental in improving the science literacy of non-technical majors. CEHR also recommends that programs foster the development of educational technology whenever possible so that new advances in science and mathematics can be disseminated quickly and effectively to all students.

Courses can be made more effective by incorporating subject-specific materials produced by the mission agencies. The mission agencies, NSF and ED will work together in the development of curricula that capitalize on the respective strengths of each agency.

Faculty Preparation and Enhancement. Good faculty inspire students, both increasing their performance and maintaining their interest in science, mathematics, and engineering disciplines. Additional efforts are needed to ensure that undergraduate faculty have contemporary content knowledge and can apply the most effective pedagogical techniques. Faculty preparation and enhancement will benefit from the formation of closer ties between the research and education components of universities. Both these outcomes should be encouraged and would benefit from organizational reform efforts.

Organizational and Systemic Reform. Organizational and systemic reform programs are intended to address problems in the structure and management of undergraduate programs. Similar to precollege efforts in this area, the level and permanence of improvement requires support of the underlying educational system. The CEHR strategy for undergraduate education calls for the establishment of programs that integrate research and teaching. This will involve a restructuring and integration of the traditionally separate schools of education and schools of mathematics, science, and engineering. Federal agencies with strong ties to science, mathematics, and engineering departments at colleges and universities (e.g. NSF and the various mission agencies) will work together with ED, which is more closely linked to schools of education. These collaborations will encourage approaches that draw upon both types of knowledge.

Linkages should exist not only among the schools within a college or university, but also between high schools and colleges, two-year and four-year colleges, and undergraduate and graduate institutions. "Bridging" efforts will be developed that smooth the progression of students between these various institutions. These articulation efforts ensure that programs build upon each other and facilitate the retention of students in the pipeline. These consortia-type programs are believed instrumental in improving the retention of minorities in science, mathematics, and engineering fields and form the basis for a new class of NSF programs in this area. Similar programs are in existence in DOE (classified as research co-ops) with its National Laboratories forming the cornerstone of several alliances.

Student Support and Incentives. At the undergraduate level, a large share of the Federal government's funding for science, mathematics, and engineering education goes to direct support for students. A significant number of programs are geared toward increasing the representation of certain groups underrepresented in these fields (e.g., minorities and women). The Undergraduate Task Force recommended expanding student support opportunities for underrepresented groups.

GRADUATE EDUCATION

For graduate education programs, the total requested for FY 1993 is $750 million, which represents 36% of the CEHR budget. This level is a $19 million, a 2% decrease from FY 1992 due to an add-on in the FY 1992 budget, and a $12 million (+2%) increase over FY 1990. In Figure 20, funding for graduate program elements is illustrated, and in Figure 21, agency spending can be seen.

Figure 20:
Graduate Program Elements

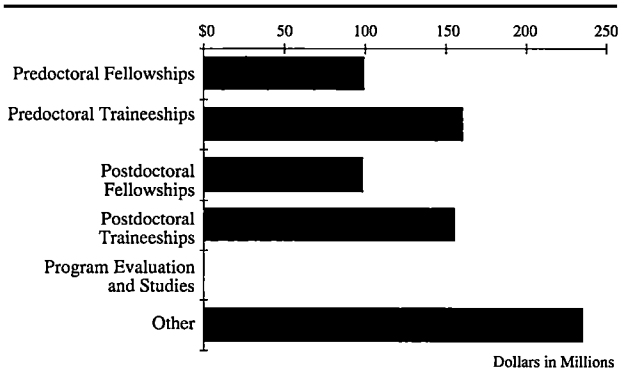
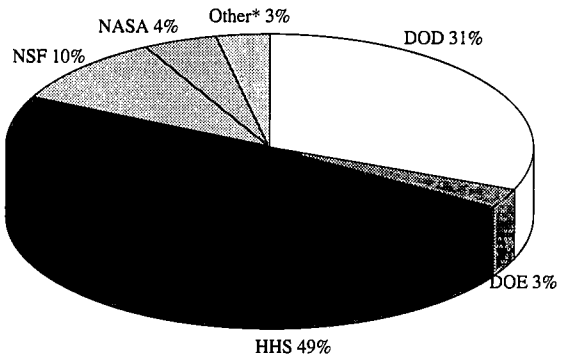


Figure 21: Graduate Budget by Agency



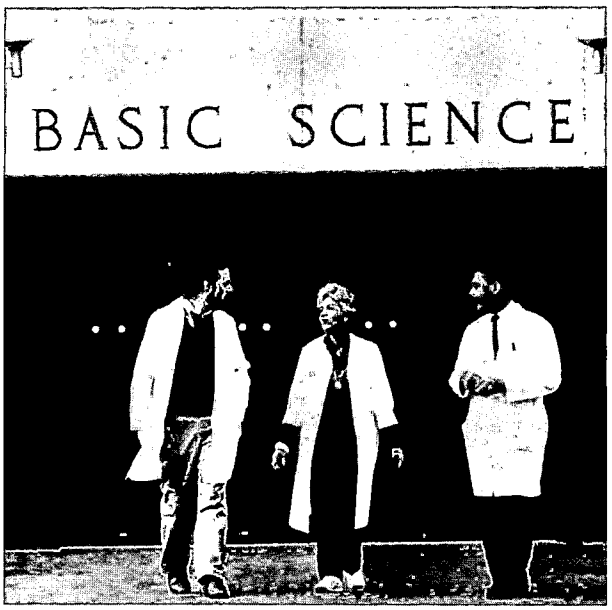
*USDA, DOC, DOI, SI, EPA

Total: $750 million

The United States is considered the world leader in graduate education, with students coming from all over the world to study and conduct graduate level research on American campuses.

HBCU graduate student in Environmental Science working at Los Alamos National Laboratory.

From the U.S. perspective, outstanding graduate programs are necessary for maintaining the cadre of scientists, mathematicians, and engineers that keep our Nation economically competitive. Federal fellowships, internships, and traineeships offered to both pre- and post-doctoral students serve a crucial role in developing future experts in these fields. Although graduate education is, in many ways, the least problematic of the three formal education levels, strong Federal support for student incentives must continue. At this education level, mission agencies play an appropriate and critical role in maintaining the supply of technical experts in the various disciplines specific to their programs. Much of the education resources of these agencies are focused on graduate education. In the FY 1993 request, nearly four-fifths of the graduate funding comes from HHS and DOD.



Much of the research that NIH supports is conducted at universities, medical schools, hospitals, and other research institutions throughout the United States and abroad. This picture was taken at the Georgetown University School of Medicine—an NIH extramural research grant site.

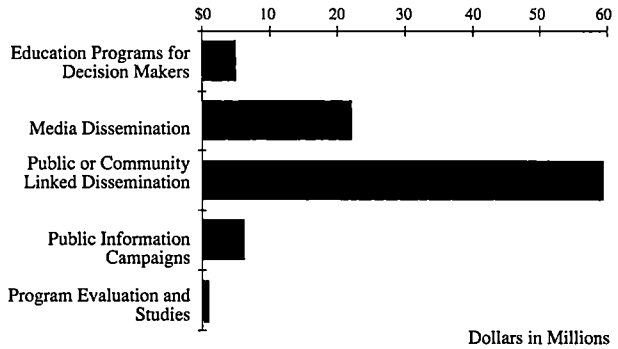
Student Incentives and Opportunities. Virtually all Federal graduate programs, pre- and postdoctoral, offer financial support and student research opportunities. NSF programs broadly address all fields of science, mathematics and engineering in support of its legislative mandate to maintain the health of the science and engineering enterprise; mission agencies concentrate their resources on disciplines critical to their particular areas of operation. All agencies will continue to evaluate the needs of specific disciplines and expand or redirect their programs as required.

PUBLIC SCIENCE LITERACY

Public science literacy is a new budget category for FY 1993, with a request of $93 million, representing 4% of the CEHR budget. Some of the programs represented in this category were included in last year's budget, mostly under precollege programs. Other agency programs are new for this year, and some have significant increases. FY 1992 was recalculated to provide a new base in order to give valid FY 1992-93 comparisons. The FY 1992-93 increase for this program area is $2 million, or 3% over FY 1992.

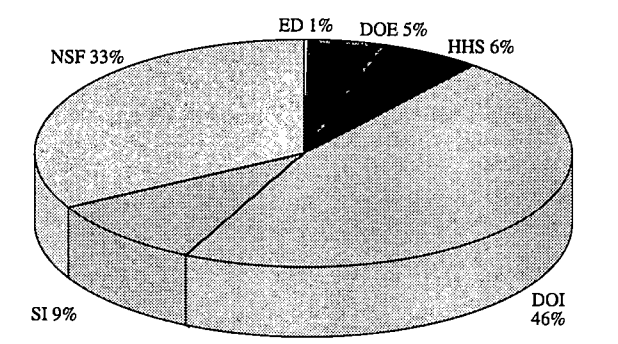
Hands-on activities at the American Museum of Science and Energy in Oak Ridge, Tennessee.

Figure 22:
Science Literacy Budget by Agency



Public science literacy has long been an overlooked component of science and mathematics education. However, adoption of both the National Education Goal for adult literacy and AMERICA 2000, which has life-long learning as one of its basic tenets, heralds increased interest in learning outside the formal education system. Scientific literacy is important for many reasons: it provides a basis on which to make informed decisions across an increasingly complex array of scientific issues (e.g., the environment, health, defense, and energy); it is critical for increasing the productivity of workers in an increasingly

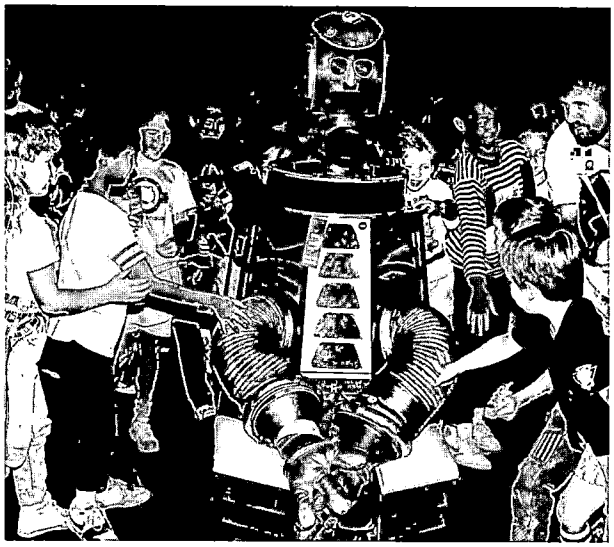
Figure 23:
Science Literacy Budget by Agency



technological society; and it leads parents to demonstrate a more positive attitude about science and mathematics to their children.

Much of CEHR's effort in science literacy has been focused on establishing a workable definition and identifying a baseline of programs and activities. The Task Force on Public Understanding of Science defined science literacy as a knowledge of the basic principles underlying scientific processes and concepts. It includes an awareness of scientific ways of thinking; an understanding of the relationship of science, mathematics, and technology to society; and the ability to use that knowledge to make informed decisions. Critical to future development of this area would be studies that assess the state of science literacy so as to define directions for future program development.

The current Federal strategy for improved public science literacy includes four components, in descending order of priority: (1) public and community-linked programs, (2) media dissemination, (3) programs for decision-makers, and (4) public information campaigns. In FY 1993, 64% of the public science literacy budget supports high-impact public and community-linked programs and media dissemination (Figure 22). DOI and NSF, combined, represent almost 80% of the funding for public science literacy (Figure 23). DOI, with its extensive park and refuge programs, represents over one-half of the reported support for public and community-linked programs; support of media programs by NSF represents nearly 70% of funding in that category.



Foobie D. Robot is part of a museum anti-drug program that stresses to children that their bodies are "million dollar machines," and that they are responsible for their personal health.

Public and Community-Linked Programs. Activities include museum and library exhibits, science centers and youth programs; a sample of the programs in this component is the National Park and Refuge programs that include Ranger talks and guided walks, interpretive displays and films. All these programs thrust science education into daily life and promote better understanding of the importance of science and scientific research to the individual. The CEHR strategy calls for increased emphasis on these programs. Coordination of these efforts with teacher or student enhancement programs would allow outside activities to reinforce what is being taught in the classroom. Mission agencies, in particular, will continue and expand the community outreach efforts centered around their regional laboratories.

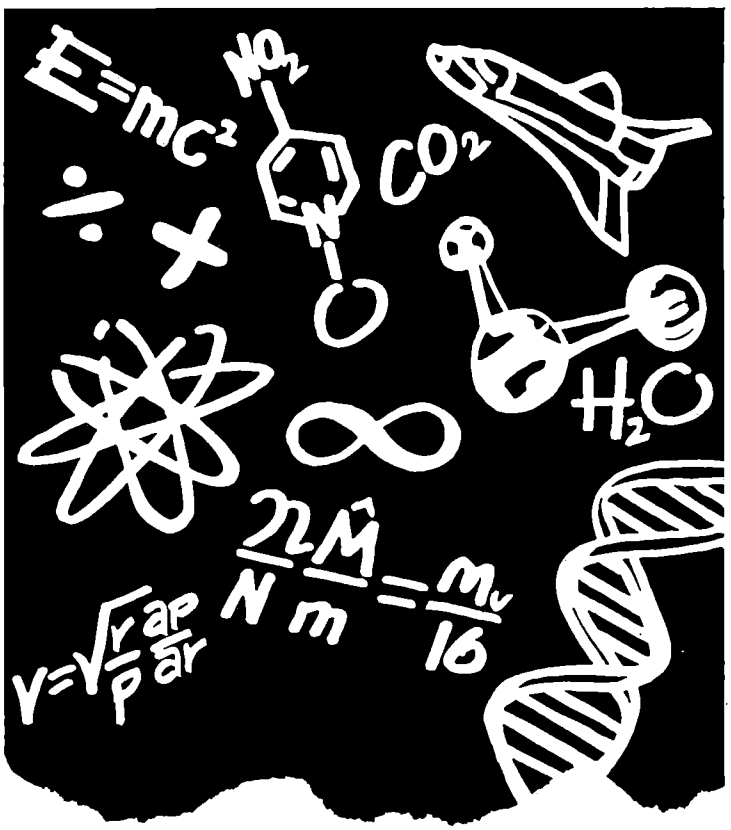
Hands-on Biology Programs...nature at first hand.

Media Dissemination. Media play a very important role in our technology-based society. Television, radio, and the press provide a cost-efficient, effective way of providing scientific information and related societal issues to millions of people. CEHR has set the goal of doubling the number of media programs by the year 2000. Care must be taken, however, that only the best products are put forward. In particular, programs must disseminate only accurate information; encourage development of instructional materials that capitalize on the media presentations; and place more emphasis on the scientific principles underlying issues that are discussed. All agencies can be involved in these programs.

Programs for Decision-Makers. These programs are designed to educate government, educational, corporate, and media decision-makers about scientific concepts, principles, and issues so that they can make informed professional decisions and aggressively support and promote policies and programs that will move the Nation toward achieving the education goals for the year 2000. Major activities would include workshops and task forces of media and government representatives and active involvement of Cabinet-level agency officials.

Public Information Campaigns. Information campaigns included in the CEHR program are those that specifically provide explanations of scientific processes. If campaigns simply encourage a change in public behavior without an explanation of the science that is involved, they are not considered science literacy. The CEHR strategy encourages agencies to increase the number of public information campaigns and individual information sources that promote science education components and directs agencies to include in their programs, as appropriate, the science behind the issues.

APPENDIX



FCCSET CEHR Charter
FY 1993 Budget Request
FY 1992 Enacted Budget
FY 1992-1993 Undergraduate Growth
Definitions
Agency Contacts

CHARTER

COMMITTEE ON EDUCATION AND HUMAN RESOURCES
of the
Federal Coordinating Council for Science, Engineering and Technology

The Committee on Education and Human Resources (CEHR) is hereby established by action of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET).

The Committee serves as a part of the internal deliberative process of the FCCSET, which provides overall guidance and direction. The Council shall serve as the forum for developing consensus and resolving issues raised in the committee process.

Purpose

The purpose of the Committee on Education and Human Resources is to address issues critical to the provision of the best possible mathematics, science, and engineering education and technical training; to enable this generation of American students to become well informed, scientifically literate citizens; to ensure the Nation of an adequate, well-trained scientific and technical workforce; and to enable the Nation to retain its world leadership position in science and technology. In carrying out its activities, the Committee will be guided by the National Education Goals and the AMERICA 2000 National Education Strategy.

Functions

Reporting to and under the direction of the Chairman of FCCSET, the Committee on Education and Human Resources will:

- **review Federal research and development and support programs directed at improving education, training, and human resources development in mathematics, science, engineering, and technology;**
- **improve planning, coordination, and communication among Federal agencies engaged in education and human resources development;**
- **address specific programmatic and operational issues and problems regarding education and human resources that affect two or more Federal agencies;**

- identify and define education, training, and human resources development priorities, in particular those pertaining to the Federal workforce, scientific and technological literacy, and the fields of mathematics, science, and engineering;

- identify Federal resources, including scientific expertise, facilities, equipment, and programs that can be utilized to achieve the National Education Goals and the AMERICA 2000 National Education Strategy and to improve scientific and technical education and training;

- develop and update long-range plans for the overall Federal effort in science, mathematics, engineering, and technology education, particularly with respect to the accomplishment of the National Education Goals and the AMERICA 2000 National Education Strategy; and

- provide reviews, analyses, advice, and recommendations to the Chairman of FCCSET on Federal policies and programs concerned with education and human resources development, particularly with respect to the accomplishment of the National Education Goals and the AMERICA 2000 National Education Strategy.

Structure

The Committee Chairman and Vice Chairmen are appointed by the Chairman of FCCSET, the Vice Chairmen being from agencies other than that of the Chairman. The Executive Secretary is designated by the Committee Chairman. Additional staff and funding assistance, consistent with the terms of this charter, are the responsibility of the Committee Chairman.

The Committee Chairman will hold no fewer than four meetings of the Committee a year and will approve agendas. Minutes of meetings will be prepared by the Committee Executive Secretary and distributed to all members of the Committee and to the Assistant Director of OSTP responsible for FCCSET.

The Committee Chairman will meet bimonthly with the FCCSET Chairman and the chairmen of other committees to evaluate progress, discuss policy coordination, receive instructions from the FCCSET, and report on ongoing activities.

The Committee Chairman will recommend action on major activities to the FCCSET Chairman for approval.

The following departments and agencies are represented on this Committee at the Assistant Secretary level or above:

Department of Defense
Department of Justice
Department of the Interior
Department of Agriculture
Department of Commerce
Department of Labor
Department of Health and Human Services
Department of Housing and Urban Development
Department of Transportation
Department of Energy
Department of Education
Department of Veterans Affairs
Office of Management and Budget
Office of Science and Technology Policy
National Aeronautics and Space Administration
Environmental Protection Agency
National Science Foundation
The Smithsonian Institution

The Committee may establish such Subcommittees and Working Groups as are necessary to carry out its functions. The Committee Chairman will appoint the chairmen of all Subcommittees and Working Groups after consultation with the Committee and approval by the FCCSET Chairman. Chairmen of CEHR Subcommittees and Working Groups will arrange assistance from their own agencies or from other agencies represented on the Subcommittees or Working Groups.

Membership on Subcommittees and Working Groups is not restricted to Committee members, but all members must be full-time Federal employees.

Charters and Statements of Roles and Objectives (SROs) will be recommended for approval to the FCCSET Chairman for all Subcommittees and Working Groups, respectively. The Charters and SROs will identify the issues to be addressed and specify the desired products and delivery times to the Committee. Charters will be distinguished from SROs by scope and by duration, with Charters developed around broad issues, renewable from year to year, and SROs focussed on more short-term issues and subject to dissolution at any time.

Private Sector Interface

The Committee will recommend to the Chairman of the FCCSET the nature of private sector advice needed to accomplish its mission. The Chairman of the FCCSET will take necessary steps to ensure appropriate interactions between the President's Council of Advisors on Science and Technology (PCAST) and the FCCSET Committee. The Committee may also interact with and receive ad hoc advice from various private sector groups as consistent with the Federal Advisory Committee Act.

Compensation

All members are full-time Federal employees who are allowed reimbursement for travel expenses by their agencies plus per diem or subsistence while serving away from their duty stations and in accordance with standard government travel regulations.

Documentation

Agendas and records of actions of Committee meetings are prepared and disseminated to members by the Executive Secretary. Records of actions are submitted to members for approval. Complete records of all Committee activities, including those of Subcommittees and Working Groups, are maintained in the office of the Chairman.

The Committee prepares a report for the Chairman of the FCCSET not later than 60 days after the end of each fiscal year. The report contains, as a minimum, the Committee's functions; a list of members; a list of Subcommittees and Working Groups; a review of all Subcommittees and Working Groups that have discharged their responsibilities and are recommended by the Committee to be brought to closure; and brief highlights of the previous year.

The Committee will produce a Report on Mathematics, Science, and Engineering Education for FCCSET to supplement the President's Budget Submission to the Congress. The Committee Chairman will present the report to the FCCSET for approval. The report will comprise integrated, coordinated, and comprehensive plans, programs, and budgets, with supporting rationale, for Federal efforts on this subject.

In preparing this report, the Committee will work with FCCSET and OSTP to assist OMB in reviewing current and proposed funding levels for selected science, engineering, and technology education issues affecting more than one agency. Such reviews will be undertaken consistent with general guidelines established by OMB and will supplement, rather than supplant, the traditional Executive Branch budget formulation process. Final budget decisions will continue to be made in the context of individual agency requests to OMB and ultimately to the President.

Figure 24:
CEHR FY 1993 Budget Matrix

	FCCSET CEHR FY 1993 Budget Request						22-Jan-92	2:49 AM				
Major Categories/Elements	FY 1993 Total Request	USDA	DOC	DOD	ED	DOE	DHHS	DOI	SI	NSF	NASA	EPA
Grand Total	**2,092.23**	**22.65**	**3.68**	**415.97**	**392.53**	**113.21**	**416.45**	**88.43**	**10.04**	**537.20**	**82.27**	**9.80**
Precollege	**767.95**	**0.72**		**4.97**	**371.20**	**32.39**	**21.84**	**25.30**	**0.63**	**286.20**	**16.70**	**8.00**
Precollege Teacher Preparation and Enhancement	436.51			0.63	286.50	16.84	5.19	2.00	0.33	114.80	7.92	2.30
Precollege Curriculum and Materials Development	91.58				2.70	4.51	2.54	6.90	0.22	67.70	5.00	2.01
A. Precollege Instructional Materials Development	65.87				2.70	4.51	2.54	6.85	0.22	43.70	4.50	0.85
B. Precollege Educational Technologies	25.71							0.05		24.00	0.50	1.16
Precollege Student Incentives and Opportunities	68.08	0.72		4.34	20.00	6.55	9.97	14.71		11.00	0.58	0.21
A. Precollege Direct Student Support	63.46	0.50			20.00	6.55	9.97	14.71		11.00	0.58	0.15
B. Bridging to Postsecondary	4.62	0.22		4.34								0.06
Precollege Organizational Reform	72.65						1.65			71.00		
Precollege Comprehensive or Multifaceted Programs	31.40				20.00	3.58	2.49			3.00	0.29	2.04
Precollege Dissemination and Technical Assistance	17.84				12.00	0.12			0.08	3.50	0.70	1.44
Precollege Program Evaluation and Studies	40.90				30.00	0.45		0.15		10.30		
A. Precollege Evaluation and Assessment	10.90					0.45		0.15		10.30		
B. Precollege Data Collection and Studies												
C. Precollege National Standards and Testing	30.00				30.00							
Precollege Other Total	8.99					0.34		1.54		4.90	2.22	
Undergraduate	**480.77**	**13.50**		**176.20**	**21.00**	**56.87**	**25.00**	**8.72**		**146.30**	**32.38**	**0.80**
Undergraduate Program Evaluation and Studies	3.90					0.10				3.80		
A. Undergraduate Evaluation and Assessment	3.90					0.10				3.80		
B. Undergraduate Data Collection and Studies												
Undergraduate Educational Technology	31.00			30.00						1.00		
Undergraduate Dissemination and Technical Assistance												
Two Year Total	12.42					1.08	1.43	0.10		8.30	1.51	
Two Year Faculty Preparation and Enhancement	4.02							0.02		3.00	1.00	
Two Year Curriculum and Materials Enhancement	2.60									2.60		
A. Two Year Course and Curriculum	0.30									0.30		
B. Two Year Laboratory Equipment	2.30									2.30		
Two Year Student Incentives and Opportunities	1.67					1.08		0.08			0.51	
A. Two Year Financial Assistance	1.08					1.08						
B. Two Year Research Experiences and Coops	0.51										0.51	
C. Bridging to Four Year Institution	0.08							0.08				
Two Year Organizational and Operational Reform	2.70									2.70		
Two Year Comprehensive or Multifaceted Programs	1.43						1.43					
Two Year Dissemination and Technical Assistance												
Two Year Other Total												
Four Year Total	433.45	13.50		146.20	21.00	55.69	23.57	8.62		133.20	30.87	0.80
Four Year Faculty Preparation and Enhancement	45.20					11.52	0.08	1.80		27.80	4.00	
Four Year Curriculum and Materials Enhancement	95.11			38.90		3.22	0.16	1.03		50.30	1.50	
A. Four Year Course and Curriculum	74.29			38.90		3.16	0.10	1.03		29.60	1.50	
B. Four Year Laboratory Equipment	20.82					0.06	0.06			20.70		
Four Year Student Incentives and Opportunities	188.38			100.50	15.00	23.97	2.24	5.25		28.80	11.82	0.80
A. Four Year Financial Assistance	133.57			100.50	15.00	11.97				5.30		0.80
B. Four Year Research Experiences and Coops	49.54					12.00	2.01	5.23		23.50	6.80	
C. Bridging to Graduate School	5.27						0.23	0.02			5.02	
Four Year Organizational and Operational Reform	29.70			6.80						22.90		
Four Year Comprehensive or Multifaceted Programs	56.61	13.50			6.00		21.09	0.43		3.20	12.39	
Four Year Dissemination and Technical Assistance												
Four Year Other Total	18.46					16.98		0.11		0.20	1.17	

Figure 24:
CEHR FY 1993 Budget Matrix (continued)

	FCCSET CEHR FY 1993 Budget Request						22-Jan-92	2:49 AM				
Major Categories/Elements	FY 1993 Total Request	USDA	DOC	DOD	ED	DOE	DHHS	DOI	SI	NSF	NASA	EPA
Graduate	**750.20**	**8.43**	**3.68**	**234.80**		**19.62**	**364.01**	**11.07**	**0.50**	**73.90**	**33.19**	**1.00**
Predoctoral Fellowships	99.54		0.30	16.70		8.21	5.64	0.10	0.09	52.40	15.30	0.80
Predoctoral Traineeships	160.81	4.00		3.90		0.55	128.99	10.42		8.40	4.35	0.20
Postdoctoral Fellowships	98.70		3.38	10.50		6.43	51.23	0.55	0.41	13.10	13.10	
Postdoctoral Traineeships	155.62	4.43				0.50	150.69					
Graduate Program Evaluation and Studies	0.10					0.10						
A. Graduate Evaluation and Assessment	0.10					0.10						
B. Graduate Data Collection and Studies												
Graduate Other Total	235.43			203.70		3.83	27.46				0.44	
Public Science Literacy	**93.32**				**0.33**	**4.34**	**5.60**	**43.34**	**8.91**	**30.80**		
Education Programs for Decision Makers	5.10					0.35		3.35		1.40		
Media Dissemination	22.09					1.13	1.21	3.25		16.50		
Public or Community Linked Dissemination	59.50					1.34	3.23	33.12	8.91	12.90		
Public Information Campaigns	6.33				0.33	1.42	0.96	3.62				
Public Science Literacy Program Evaluation and Studies	0.30					0.10	0.20					
A. Public Science Literacy Evaluation and Assessment	0.30					0.10	0.20					
B. Public Science Literacy Data Collection and Studies												
Public Science Literacy Other Total												

Figure 25:
CEHR FY 1992 Enacted Budget

	FCCSET CEHR FY 1992 Budget Rebaselined						22-Jan-92	2:51 AM				
Major Categories/Elements	FY 1992 Baseline	USDA	DOC	DOD	ED	DOE (1)	DHHS	DOI	SI	NSF	NASA	EPA
Grand Total	**1,954.74**	**20.36**	**3.51**	**415.97**	**293.83**	**108.56**	**411.94**	**82.73**	**9.96**	**521.80**	**77.79**	**8.30**
Precollege	**650.71**	**0.71**		**4.97**	**283.00**	**22.95**	**20.17**	**21.67**	**0.55**	**276.20**	**14.00**	**6.50**
Precollege Teacher Preparation and Enhancement	382.56			0.63	240.00	7.07	4.88	2.06	0.25	120.80	5.87	1.00
Precollege Curriculum and Materials Development	83.35				2.00	4.66	2.18	4.08	0.22	63.70	4.50	2.01
A. Precollege Instructional Materials Development	61.65				2.00	4.66	2.18	4.03	0.22	43.70	4.01	0.85
B. Precollege Educational Technologies	21.71							0.05		20.00	0.50	1.16
Precollege Student Incentives and Opportunities	46.48	0.71		4.34		6.55	9.27	13.85		11.00	0.55	0.21
A. Precollege Direct Student Support	27.80	0.50				6.55	9.27			11.00	0.33	0.15
B. Bridging to Postsecondary	18.68	0.21		4.34				13.85			0.22	0.06
Precollege Organizational Reform	60.34						1.34			59.00		
Precollege Comprehensive or Multifaceted Programs	27.35				16.00	3.54	2.49			3.00	0.28	2.04
Precollege Dissemination and Technical Assistance	17.63				12.00	0.12			0.08	3.50	0.69	1.24
Precollege Program Evaluation and Studies	24.10				13.00	0.45		0.15		10.50		
A. Precollege Evaluation and Assessment	11.10					0.45		0.15		10.50		
B. Precollege Data Collection and Studies												
C. Precollege National Standards and Testing	13.00				13.00							
Precollege Other Total	8.89					0.56		1.53		4.70	2.10	
Undergraduate	**444.25**	**11.75**		**176.20**	**10.50**	**55.47**	**24.72**	**9.08**		**122.20**	**33.53**	**0.80**
Undergraduate Program Evaluation and Studies	3.60					0.10				3.50		
A. Undergraduate Evaluation and Assessment	3.60					0.10				3.50		
B. Undergraduate Data Collection and Studies												
Undergraduate Educational Technologies	31.00			30.00						1.00		
Undergraduate Dissemination and Technical Assistance												
Two Year Total	12.11					1.95	1.43	0.10		6.90	1.73	
Two Year Faculty Preparation and Enhancement	3.57							0.02		2.30	1.25	
Two Year Curriculum and Materials Enhancement	2.60									2.60		
A. Two Year Course and Curriculum	0.30									0.30		
B. Two Year Laboratory Equipment	2.30									2.30		
Two Year Student Incentives and Opportunities	2.51					1.95		0.08			0.48	
A. Two Year Financial Assistance	2.43					1.95					0.48	
B. Two Year Research Experiences and Coops	0.08							0.08				
C. Bridging to Four Year Institution												
Two Year Organizational and Operational Reform	2.00									2.00		
Two Year Comprehensive or Multifaceted Programs	1.43						1.43					
Two Year Dissemination and Technical Assistance												
Two Year Other Total												
Four Year Total	397.55	11.75		146.20	10.50	53.43	23.29	8.98		110.80	31.80	0.80
Four Year Faculty Preparation and Enhancement	33.09					4.89	0.08	1.82		22.30	4.00	
Four Year Curriculum and Materials Enhancement	100.85			38.90		12.81	0.16	1.12		46.20	1.66	
A. Four Year Course and Curriculum	79.98			38.90		12.70	0.10	1.12		25.50	1.66	
B. Four Year Laboratory Equipment	20.87					0.11	0.06			20.70		
Four Year Student Incentives and Opportunities	166.04			100.50	4.50	18.85	2.24	5.50		22.40	11.25	0.80
A. Four Year Financial Assistance	129.20			100.50	4.50	6.85				5.30	11.25	0.80
B. Four Year Research Experiences and Coops	36.59					12.00	2.01	5.48		17.10		
C. Bridging to Graduate School	0.25						0.23	0.02				
Four Year Organizational and Operational Reform	23.90			6.80						17.10		
Four Year Comprehensive or Multifaceted Programs	54.87	11.75			6.00		20.81	0.43		2.60	13.28	
Four Year Dissemination and Technical Assistance												
Four Year Other Total	18.80					16.88		0.11		0.20	1.61	

Figure 25:
CEHR FY 1992 Enacted Budget (continued)

	FCCSET CEHR FY 1992 Budget Rebaselined						22-Jan-92	2:51 AM				
Major Categories/Elements	FY 1992 Baseline	USDA	DOC	DOD	ED	DOE (1)	DHHS	DOI	SI	NSF	NASA	EPA
Graduate	**768.88**	**7.90**	**3.51**	**234.80**		**24.84**	**362.26**	**11.22**	**0.50**	**92.60**	**30.26**	**1.00**
Predoctoral Fellowships	99.77		0.30	16.70		10.93	5.30	0.25	0.09	52.40	13.80	
Predoctoral Traineeships	180.28	3.50		3.90		0.70	128.96	10.42		28.60	3.40	0.80
Postdoctoral Fellowships	98.79		3.21	10.50		8.93	50.75	0.55	0.41	11.60	12.64	0.20
Postdoctoral Traineeships	154.79	4.40				0.60	149.79					
Graduate Program Evaluation and Studies	0.10					0.10						
A. Graduate Evaluation and Assessment	0.10					0.10						
B. Graduate Data Collection and Studies												
Graduate Other Total	235.16			203.70		3.58	27.46				0.42	
Public Science Literacy	**90.89**				**0.33**	**5.31**	**4.79**	**40.76**	**8.91**	**30.80**		
Education Programs for Decision Makers	1.74					0.34				1.40		
Media Dissemination	21.73					1.13	0.90	3.20		16.50		
Public or Community Linked Dissemination	56.90					1.34	3.23	30.52	8.91	12.90		
Public Information Campaigns	6.95				0.33	2.40	0.65	3.57				
Public Science Literacy Program Evaluation and Studies	3.57					0.10		3.47				
A. Public Science Literacy Evaluation and Assessment	3.57					0.10		3.47				
B. Public Science Literacy Data Collection and Studies												
Public Science Literacy Other Total												

[1] Does not include a one-time $4.5 million reprogramming.

Figure 26:
FY 1992-1993 Undergraduate Growth

	FY 1992 Baseline	FY 1993 Request	Change	% Change
Undergraduate	**444.25**	**480.77**	**36.52**	**8%**
Undergraduate Program Evaluation and Studies	3.6	3.9	0.3	8%
A. Undergraduate Evaluation and Assessment	3.6	3.9	0.3	8%
B. Undergraduate Data Collection and Studies				
Undergraduate Educational Technology	31	31		
Undergraduate Dissemination and Technical Assistance				
Two Year Total	12.11	12.42	0.31	3%
Two Year Faculty Preparation and Enhancement	3.57	4.02	0.45	13%
Two Year Curriculum and Materials Enhancement	2.6	2.6		
A. Two Year Course and Curriculum	0.3	0.3		
B. Two Year Laboratory Equipment	2.3	2.3		
Two Year Student Incentives and Opportunities	2.51	1.67	-0.84	-33%
A. Two Year Financial Assistance	2.43	1.08	-1.35	-55%
B. Two Year Research Experiences and Coops	0.08	0.51	0.43	538%
C. Bridging to Four Year Institution		0.08	0.08	0
Two Year Organizational and Operational Reform	2	2.7	0.7	35%
Two Year Comprehensive or Multifaceted Programs	1.43	1.43		
Two Year Dissemination and Technical Assistance				
Two Year Other Total				
Four Year Total	397.55	433.45	35.9	9%
Four Year Faculty Preparation and Enhancement	33.09	45.2	12.11	37%
Four Year Curriculum and Materials Enhancement	100.85	95.11	-5.74	-6%
A. Four Year Course and Curriculum	79.98	74.29	-5.69	-7%
B. Four Year Laboratory Equipment	20.87	20.82	-0.05	
Four Year Student Incentives and Opportunities	166.04	188.38	22.34	13%
A. Four Year Financial Assistance	129.2	133.57	4.37	3%
B. Four Year Research Experiences and Coops	36.59	49.54	12.95	35%
C. Bridging to Graduate School	0.25	5.27	5.01	1981%
Four Year Organizational and Operational Reform	23.9	29.7	5.8	24%
Four Year Comprehensive or Multifaceted Programs	54.87	56.61	1.74	3%
Four Year Dissemination and Technical Assistance				
Four Year Other Total	18.8	18.46	-0.34	-2%

DEFINITIONS

Precollege: Science and mathematics education programs directed at students below the postsecondary level (i.e., preschool and kindergarten, as well as elementary, middle and high school). Pre- and in-service training for precollege teachers are included here even if such training is received at colleges and universities.

Undergraduate: Science, mathematics, engineering and technology programs directed at students below the baccalaureate level but beyond secondary school. Relevant institutions include two-year (both for terminal as well as preparation for baccalaureate degrees), four-year colleges, and comprehensive and graduate institutions offering baccalaureate degrees.

Graduate: Science, mathematics, engineering, and technology programs directed at students beyond the baccalaureate level.

Teacher: Precollege educator.

Faculty: Postsecondary educator.

Public Understanding of Science and Technology [Science Literacy]: Programs specifically focused on increasing public understanding and knowledge of science and its impact on society. These programs educate audiences of all ages about the principles underlying scientific methods and processes. Programs geared to changing behaviors (i.e., public information, consumer education, health promotion and disease prevention) without offering specific and detailed information on the science behind the recommended changes, are not included.

Underrepresented Groups: Underrepresented groups include ethnic minorities (e.g., American Indians, Alaskan Natives, Blacks [not of Hispanic origin], Hispanics [Mexicans, Puerto Ricans, Cubans, and Central or South Americans], Pacific Islanders); females; persons with disabilities; those with limited English proficiency; and the economically disadvantaged.

Teacher and Faculty Preparation: Program targeted on pre-service preparation (disciplinary and pedagogical) for instruction in science, mathematics, engineering, and/or technology. Activities include development and evaluation of innovative approaches to teacher preparation and research on factors affecting the recruitment and preparation of teachers. Not included are programs that are purely pedagogical in nature or that replicate courses normally available through graduate departments. Pre-service programs designed for teachers are categorized as "precollege."

Teacher and Faculty Enhancement: Continuing education, in-service programs that update skills, as well as enrich and strengthen the theoretical and practical basis for classroom and laboratory instruction. Programs can include both content and pedagogy, but do not primarily enhance research ability, are not *purely* pedagogical in nature, and do not replicate courses normally available in graduate departments. In-service programs designed for teachers are categorized as "precollege."

Curriculum Reform, R&D in Teaching & Learning: Programs leading to development and/or implementation of:

- new or improved courses, curricula, laboratory experiences, instructional materials (e.g., print, computer software, video materials), and delivery mechanisms. This category includes support of national projects such as AAAS "Project 2061," NCTM Standards, NSTA "Scope Sequence and Coordination"; and the NAS Mathematical Sciences Education Board;

- educational technologies (e.g., computers and software, interactive computer-videodisc systems, CD-ROM (compact disc, read only memory), satellites, cables, fiber optics, audio and video recording, television, and radio) that can significantly increase the efficiency and effectiveness of instruction at all levels. Applications include distance learning, innovative educational systems, intelligent tutors, authoring systems, problem-solving tools, "microworlds", and expert systems;

- research in teaching and learning to identify significant factors affecting how children learn; how to best meet the learning needs of underrepresented groups; and how to effectively transmit knowledge to children at all grade levels.

Organization and Systemic Reform: Programs designed to make systemic changes in education systems with the dual objective of increasing the number of students studying science, mathematics, engineering, and technology and improving the quality of instruction received. Reform programs generally affect all aspects of an educational system including teachers, curricula, and administrative practices and generally involve collaborative partnerships among members of the science and engineering enterprise (e.g., legislative and education officials, schools, higher education institutions, the research establishment, business and industry, professional organizations, community groups). Organization and operational reform applies to both precollege and postsecondary levels; systemic reform is applicable primarily at the precollege level.

Comprehensive Programs: Programs specifically designed to address simultaneously multiple program areas (e.g., curriculum/ materials development, teacher/faculty enhancement, community involvement).

Student Support, Incentives, and Opportunities: Programs providing direct student financial assistance (e.g., fellowships, traineeships, scholarships) and/or research experiences (e.g., research and teaching assistantships, enrichment experiences, and cooperative work-study) or facilitating the transition (bridging) from one education level to another (e.g., high school to undergraduate, two-year to four-year colleges, undergraduate to the workplace, undergraduate to graduate). Bridging programs are categorized in the education level of origin. Programs designed specifically to support training of future science, mathematics, engineering, and technology educators are categorized under teacher or faculty preparation/ enhancement.

Program Evaluation and Assessment: Programs and activities designed to generate data and analyses that provide information on the operation of an agency's education programs.

Relevant activities include development of databases for monitoring project performance and related evaluation and assessment studies that indicate the effectiveness of projects and/or entire programs in meeting stated goals and objectives.

Data Collection and Studies: Programs and activities designed to provide data and analytic studies—aggregate in nature—that describe the environment in which education programs operate, broadly supporting policy development.

National Standards and Testing: Support of activities specifically related to development of national curriculum standards and a nationwide examination system for science and mathematics.

Dissemination and Technical Assistance: Programs and activities that encourage the widespread dissemination, exchange and use of knowledge, materials, and practices to improve science, mathematics, engineering and technology education. Includes support for activities and programs that provide technical assistance to educators that encourages adoptions and utilization of the products of education programs.

Other: Includes activities not appropriate for categorization under program elements. An example of such activities would be awards to schools, students or teachers/faculty for demonstrated excellence in scientific and technical fields.

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Kindergartner Corey Sack won first prize in the Brookhaven National Laboratory Elementary School Science Fair. Her entry, "A Squirrel's Tale," documented her observations of squirrel behavior.