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THE WHITE HOUSE

WASHINGTON

January 14, 1992

MEMORANDUM FOR ROGER B. PORTER
CHARLES E.M. KOLB

FROM: RAE NELSON *OR*
DOREEN TORGERSON *DMT*

SUBJECT: FCCSET Report on Mathematics and Science
Education

Attached is a draft copy of "By the Year 2000: First in the World," FCCSET's report on Administration mathematics and science education resources and initiatives which will be a supplement to the FY 93 budget. Comments on the draft are due to the Office of Management and Budget by close of business tomorrow.

You may wish to note language on p. iv which states, "The President has initiated the development of an Executive Order to direct all Federal agencies to make excess personal computer equipment available to local school systems." We are checking on the status of the proposed EO and will highlight this language for OMB. In addition, we have noted minor typographical errors and consistency issues on the attached draft.

Please let us know if there is additional information you would like regarding the report or if there are additional issues you would like us to address.

Attachment

January 20, 1991

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

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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 CEHR's accomplishments, budget increases 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

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16?

mathematics, science and technology education. Entitled "AMERICA 2000," the strategy identifies four tracks for accomplishing national education reform: 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.

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

Figure I: Strategic Priorities and Objectives

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 \$136 million (or 7%) over the FY 92 enacted levels for the programs and a \$633 million (or 43%) increase over FY 90 enacted levels [Figure II].

Insert Figure II: FY 1992-93 Growth by Education Level

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:

⁷
Precollege: \$766 million, 37% of the CEHR budget.
Increase over FY 1992: \$116 million (+15%)
Increase over FY 1990: \$423 million (+123%)

Undergraduate: \$481 million, 23% of the CEHR budget.
Increase over FY 1992: \$38 million (+9%)
Increase over FY 1990: \$97 million (+25%)

Graduate: \$756 million, 36% of the CEHR budget.
Increase over FY 1992: -\$20 million (-3%)
Increase over FY 1990: \$18 million (+2%)

[Science Literacy: -?]

⁷
^ (see p. 11)

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Public Science Literacy: \$95 million, 5% of the CEHR budget.
Increase over FY 1992: \$ 4 million (4%)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 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 44,000. In addition, the initiative supports shorter-term training opportunities to 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. The Department of Education 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. The Department of Energy 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. To further the AMERICA 2000 objective of establishing national electronic networks linking all American schools and other sites where learning occurs, the budget proposes a series of national demonstration programs for the use of Federal agency electronic communication technology to enhance math/science curricula across a wide number of schools. The teaching of mathematics and science is ideally suited to the use of electronic dissemination technologies because of unique demonstrations and subject matter that otherwise may not be included in the normal curriculum.

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

A number of Federal agencies, including DOD, NASA, DOE, USDA, and NSF, currently employ long-distance electronic communications technologies (e.g., satellite broadcasting, fiber optic based communications, and computer networks) to provide technical training and dissemination of scientific information in support of agency programs and missions. In addition, the Department of Education through its Star Schools program and NSF have been supporting distance learning programs, particularly to assist rural school systems with limited access to educational resources. This initiative would seek to link together the expertise of ED and NSF in establishing such programs, the resources of the other Federal agencies that have existing capabilities to demonstrate the programs, and the private sector and State and local school authorities. Specific demonstration programs would be selected for further support on the basis of a national conference to review the merits and potential of the various programs. The conference will be held in 1992 and will be coordinated through the Committee.

be

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. The Federal government currently sells surplus computer equipment totalling over \$150 million annually. In future years, the amount of excess personal computers and related equipment is expected to rise due to the turnover of current Federal assets.

The President has initiated the development of an Executive Order to direct all Federal agencies to make excess personal computer equipment available to local school systems. In addition, Federal laboratories will be directed to identify and transfer excess scientific equipment that is appropriate for use in education curricula at elementary and secondary schools.

is it accurate to say this? (perhaps "the Administration" or FLESET)

*

CEHR ACCOMPLISHMENTS

In its eighteen months of work, 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.

"sixteen" ?
(see p.4)

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; ?
- Developed the new science literacy budget category 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 in precollege, undergraduate, graduate and science literacy education levels;
- 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 toward 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.

The FCCSET-CEHR strategic framework (Figure I on Page ii) was designed to address three National Education Goals that 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. CEHR has programs in each track.

consistency
through
document

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.

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, and the first descriptive listing of programs administered by sixteen participating agencies.

16 on p. iv

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, DOL and 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

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 this past year, four agencies (DOL, HUD, DOT, and VA) reviewed their education programs and determined that they fell outside the Category 1 definition.

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 problems 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 coordinated Federal to help meet the National Goals. *challenges* *effort* *?*

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 and categorized them according to degree of focus on mathematics and science education. 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. The first inventory and its successor volumes 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 overlaps 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 budget line-item level.

Cost Effectiveness

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.

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 during the next several years 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, FCCSET-CEHR will establish a Strategic Planning Working Group, chaired by ED, and Task Forces on Federal Schools, chaired by DOI, and on Technical Education, to be chaired by DOL.

Task Force on Technical Education. National Education Goals #3 and #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 to compete in a global economy. Over the next year, DOL will take lead responsibility for extending 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 FCCSET 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 FCCSET CEHR agencies in an examination of how the Federal government is teaching mathematics and science in the school systems that it operates, i.e., BIA system schools, DODDS system.

National Conference on Educational Technologies. FCCSET CEHR will sponsor a national conference on educational technologies, described more fully in the "New Initiatives" section on page 12. ✓

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 better provide parents, teachers and administrators with information on local programs.

CEHR FY 1993 BUDGET SUMMARY

FY 1993 BUDGET REQUEST

The President's FY 1993 budget proposes the investment of \$2.098 billion in mathematics, science, engineering, technology, and science literacy education programs, along priority lines indicated in Figure 3: Strategic Priorities and Objectives. This represents an increase of \$136 million or 7% over the FY 1992 enacted levels for these programs (Figure 4: FY 1992-93 Growth by Education Level), and a \$634 million, or 43% increase over their FY 1990 enacted levels (Figure 7).

Insert Figure 3: Strategic Priorities and Objectives

Insert Figure 4: FY 1992-1993 Growth by Education Level

The FY 1993 request is distributed by education level as shown in Figure 5: FY 1993 Request by Education Level: \$767 million for precollege (37% of the total request), \$481 million for undergraduate (23%), \$756 million for graduate (36%), and \$95 million for science literacy (5%). Insert Figure 5: FY 1993 Request by Education Level

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p. ii ✓
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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 (+18%), followed by undergraduate (+9%), science literacy (+4%), followed by a decrease in graduate (-3%) education, due to add-ons in the FY 1992 budget.

Figure 6: FY 1993 Budget Request by Agency and Major Program Area and Figures 7 and 7A: FY 1992-1993 Growth, show the President's FY 1993 request for CEHR programs in detail by agency, educational level and major program area. Additional information can be found in the complete budget matrix, Figure 22, found in the Appendix.

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

Insert Figure 7: FY 1992-1993 Growth: By Agency

Insert Figure 7A: FY 1992-1993 Growth by Program Element

FY 1990-93 GROWTH

The FY 1993 request marks the third year of significant increases for Federal programs in mathematics, science, technology and engineering education. As shown in Figure 8: FY 1990-1993 Growth Table: By Education Level, and in Figures 9 and 10, the multi-agency growth over the three year period has been an unprecedented 43%, a \$633 million 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.

the

Insert Figure 8: FY 1990-1993 Growth Table: By Education Level

Insert Figure 9: FY 1990-1993 Growth Chart: By Education Level

Insert Figure 10: FY 1990-1993 Growth: By Agency

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 44,000. In addition, the initiative supports shorter-term training opportunities to 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.

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A number of Federal agencies, including DOD, NASA, DOE, USDA, and NSF,

currently employ long-distance electronic communications technologies (e.g., satellite broadcasting, fiber optic based communications, and computer networks) to provide technical training and dissemination of scientific information in support of agency programs and missions. In addition, the Department of Education through its Star Schools program and NSF have been supporting distance learning programs, particularly to assist rural school systems with limited access to educational resources. This initiative would seek to link together the expertise of ED and NSF in establishing such programs, the resources of the other Federal agencies that have existing capabilities to demonstrate the programs, and the private sector and State and local school authorities. Specific demonstration programs would be selected for further support on the basis of a national conference to review the merits and potential of the various programs. The conference will be held in 1992 and will be coordinated through the Committee.

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. The Federal government currently sells surplus computer equipment totalling over \$150 million annually. In future years, the amount of excess personal computers and related equipment is expected to rise due to the turnover of current Federal assets.

is it accurate to say this?
The President has initiated the development of an Executive Order to direct all Federal agencies to make excess personal computer equipment available to local school systems. In addition, Federal laboratories will be directed to identify and transfer excess scientific equipment that is appropriate for use in education curricula at elementary and secondary schools.

NSF-ED Memorandum of Understanding. The Department of Education and the National Science Foundation have signed a Memorandum of Understanding in order to implement a formal mechanism for interaction so as to ensure effective planning, information exchange, and collaboration.

This MOU provides the administrative and institutional framework for helping to carry out the new initiatives. These two agencies fund 40% of CEHR's activities.

A working group of representatives of the two agencies will develop a programmatic strategy for implementation of Administration initiatives in mathematics and science education, that coordinates the activities of the two agencies and addresses both individual and joint responsibilities. Milestones will be established and progress toward their achievement monitored.

independent

Figure 13: Budget Highlights by Agency

National Science Foundation (NSF):

Department of Education (ED): For 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 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.

math +
sci. or
all?

Department of Energy (DOE): In 1992, 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.

Department of Defense (DOD): 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): 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 (NASA): In 1992, 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 (DOI): In FY 1993, over 3 million teachers and students will be reached through the National Park Service's "Parks as Classrooms" program

approximately 44,000 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 FCCSET CEHR, both ED and NSF will play lead roles in the preparation of teachers by working with universities to improve preservice 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 ~~are tied~~ to the world class standards. The President's AMERICA 2000 strategy addresses this issue by supporting state efforts to expand alternative routes for certifying teachers to encourage more qualified individuals to enter the teaching profession

relate

Curriculum Reform. Teaching that significantly improves student performance depends on the availability of quality curricula. The 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 these standards, the Department of Education, through its Eisenhower National Programs, is sponsoring the development of State curriculum frameworks that will guide district curricula.

The FCCSET CEHR strategy also calls for development and dissemination of high quality, comprehensive, and integrated curriculum models that span the precollege continuum. The strategy includes continuing support for ~~the national~~ curriculum projects such as NCTM and Mathematical Sciences Education Board's implementation of the math standards, 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 curriculum materials, and when necessary, development of new curricula.

(we do not support a "national" curriculum)

✓ (see P 29)
✓

To promote both efficiency and effectiveness of the Federal investment in curricula projects, the FCCSET-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.

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 introductions of new textbooks will have little impact if the educational system continues its "business-as-usual" approach. The Federal government is now taking a more active role in 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 FCCSET CEHR strategy calls for a substantial increase in support for organizational and systemic reform activities that address all aspects of education. ✓

Reform activities will primarily be carried out through the efforts of ED and NSF. At ED, two of the cornerstones of AMERICA 2000 are choice and the creation of New American Schools, both of which will lead to fundamental restructuring. 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.

There is a role in reform for all agencies, however. To affect 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. 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 from which scientists and science teachers, can be drawn. 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. ✓

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.

The FCCSET 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. FCCSET 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 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 FCCSET-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.

PUBLIC SCIENCE LITERACY

Public science literacy is a new budget category for FY 1993, with a request of \$95 million, representing 5% of the CEHR budget. Some of the programs represented in this category were included in last year's budget, mostly under precollege programs; others are new for this year, and some have significant increases. Both precollege and science literacy were recalculated to provide a new base for FY 1992, to give valid FY 1992-93 comparisons. The FY 1992-93 increase for this program area is \$4 million, or 4% over FY 1992.

Insert Figure 20: Science Literacy Program Elements

Insert Figure 21: 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 technological society; and it leads parents to demonstrate a more positive attitude about science and mathematics to their children.

Much of FCCSET-CEHR's efforts 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, over 65% of the public science literacy budget supports high-impact public and community-linked programs and media dissemination (Figure 17). DOI and NSF, combined, represent over 75% of the funding for public science literacy (Figure 18). 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.

2008

THE WHITE HOUSE

WASHINGTON

October 7, 1991

MEMORANDUM FOR ROGER B. PORTER

FROM: CHARLES E.M. KOLB *CEMK*
SUBJECT: FCCSET Budget Priorities

600P
Attached for your information is background material concerning the proposed FCCSET budget cross-cut for FY '93. While I believe these priorities are generally headed in the right direction, I was particularly pleased to see a significant (88%) increase in program evaluation for National Science Foundation and Department of Education mission agencies.

THANKS |
Of the participating departments, the Department of Education appears to be the biggest spender, with a percentage increase from FY '92 to FY '93 proposed at 43.53% for math and science-related activities. I will continue to keep you informed as the FCCSET cross-cut process continues.

LBP
10-9-91
Attachment



DEPARTMENT OF ENERGY
Washington, DC 20585

September 27, 1991

OFFICE OF THE SECRETARY

MEMORANDUM

TO: FCCSET-CEHR MEMBERS
WORKING GROUP MEMBERS

FROM: PEGGY DUFOUR *P. Dufour*
CEHR EXECUTIVE SECRETARY

SUBJECT: BRIEFING MATERIALS FOR SEPTEMBER 30 MEETING

The purpose of Monday's meeting, scheduled for 3:00-4:30 PM at DOE Headquarters, is to select a preferred budget option to recommend to OMB for FY 1993.

Attached are:

1. CEHR FY 1993 Budget Options (summary sheet)
2. Special Option description
3. FY 92-93 Agency Request comparison
4. FY 91-97 Table
5. FY 1992 Baseline charts (10)

Worksheets and comparison graphs for all options, showing the impact of each across all agencies and program areas, will be available at Monday's meeting.

Please review items 1 and 2 to determine your preference and/or changes you would make.

Thank you.

Attachments

4/872

CEHR FY 1993 BUDGET OPTIONS

<u>Option</u>	<u>New Money</u>	<u>Percent Increase</u>	<u>New Total</u>	<u>What's Added</u>
1	---	---	\$1,866.00	Nothing (FY 1992 level frozen)
2	\$57.00	3.0%	\$1,923.00	Precollege only
3	\$97.00	5.2%	\$1,963.00	Precollege/undergraduate only
4	\$194.00	10.4%	\$2,060.00	Precollege, undergraduate, science literacy, and graduate
5	\$257.16	13.8%	\$2,123.00	Agency request
6	\$295.00	15.8%	\$2,161.00	5% + Special option*

*

Special option

\$198.00

10.5%

\$2,058.00

5/872

SPECIAL PACKAGE OPTION

Multi-agency collaborative initiative. \$198 million package could be used alone or to supplement the 5% option, making a total increase of about 15% over FY 1992.

PrecollegeTeacher Enhancement

+50 million (12%)

Joint NSF/mission agency funded program to train teachers in Federal labs. Would reach an additional 5,000 teachers for 6 weeks plus 10-15 days follow-up

Teacher Preparation

+ 8 million (57%)

GraduateStudent Incentives

+40 million (5%)

Science Literacy

+ 5 million (6%)

Special IssuesDissemination

+11 million (12X)

National Research Education Network (NREN)

Supports "America on-line" AMERICA 2000

Program Evaluation

+14 million (88%)

NSF/ED/mission agencies

Educational Technologies

+10 million (24%)

Underrepresented GroupsPrecollege-post-doctoral student programs

+60 million (29%)

Multi-agency; includes dissemination, evaluation

SUBTOTAL:

\$ 198 million

+5% Option:

97 million (5%)

TOTAL:

\$ 295 million(15.8%)

* just

6/872

7/872

		FCCSET CEHR Budget Table			
		1992	1993	Increase	Percent Increase
			Agency Request		
Total Request		1866.39	2123.55	257.1613	13.78%
USDA		18.69	22.65	3.962	21.20%
DOC		3.51	3.67	0.165	4.71%
DOD		378.20	415.97	37.777	9.99%
DoED		296.83	426.03	129.2	43.53%
DOE		109.78	108.13	-1.651	-1.50%
DHHS		420.14	441.36	21.2163	5.05%
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Undergraduate		416.07	499.41	83.3428	20.03%
Graduate		754.66	788.54	33.8832	4.49%
Public Science Literacy		87.12	90.04	2.92143	3.35%
(millions of dollars)					

1:05 PM

*does not reflect rebaselining in FY 92

9/8/92

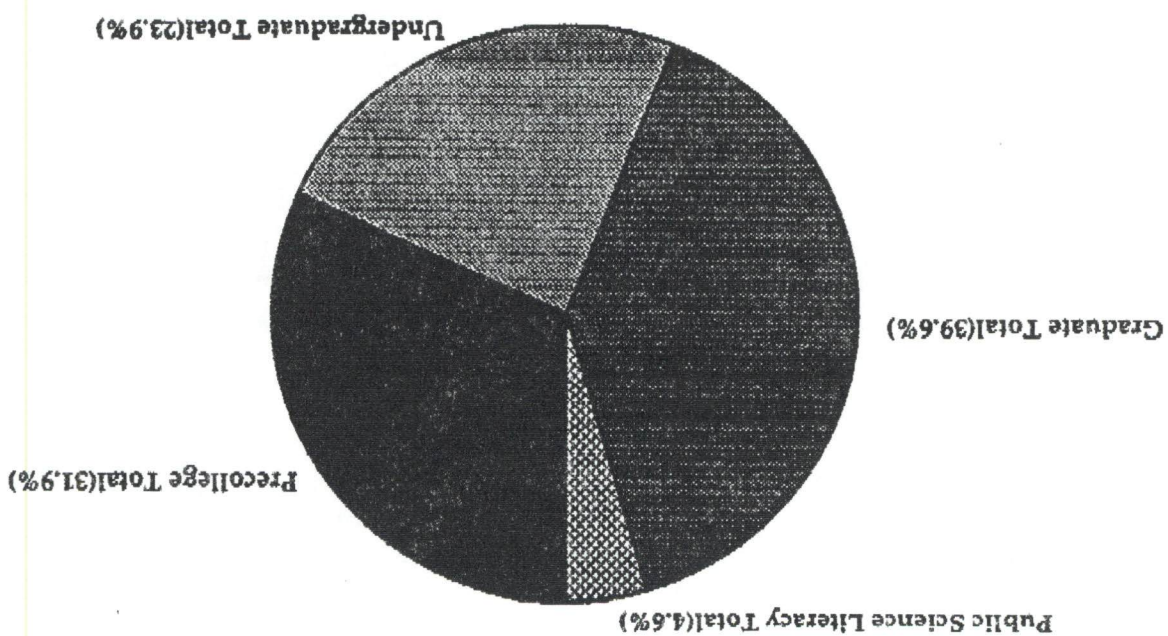
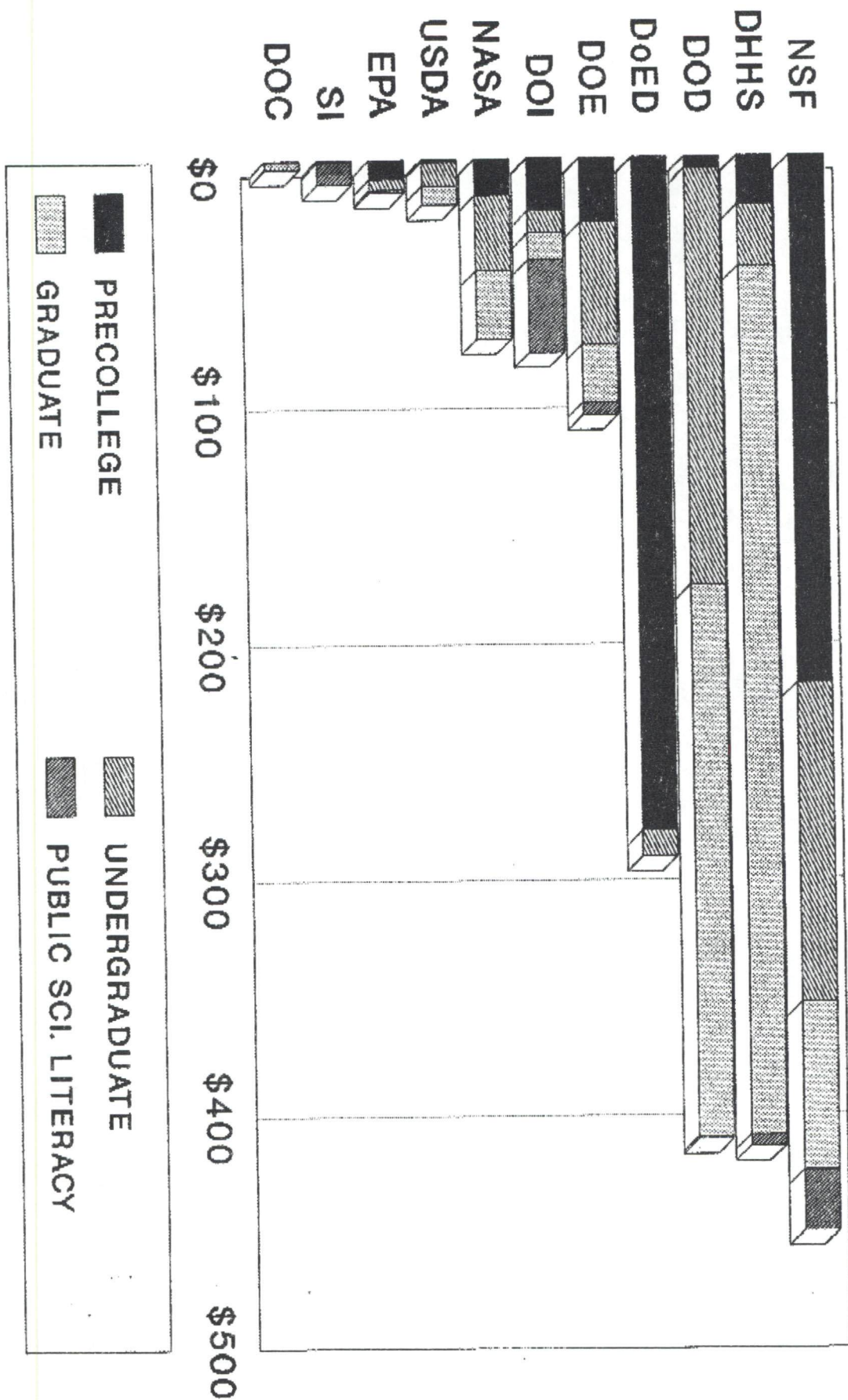


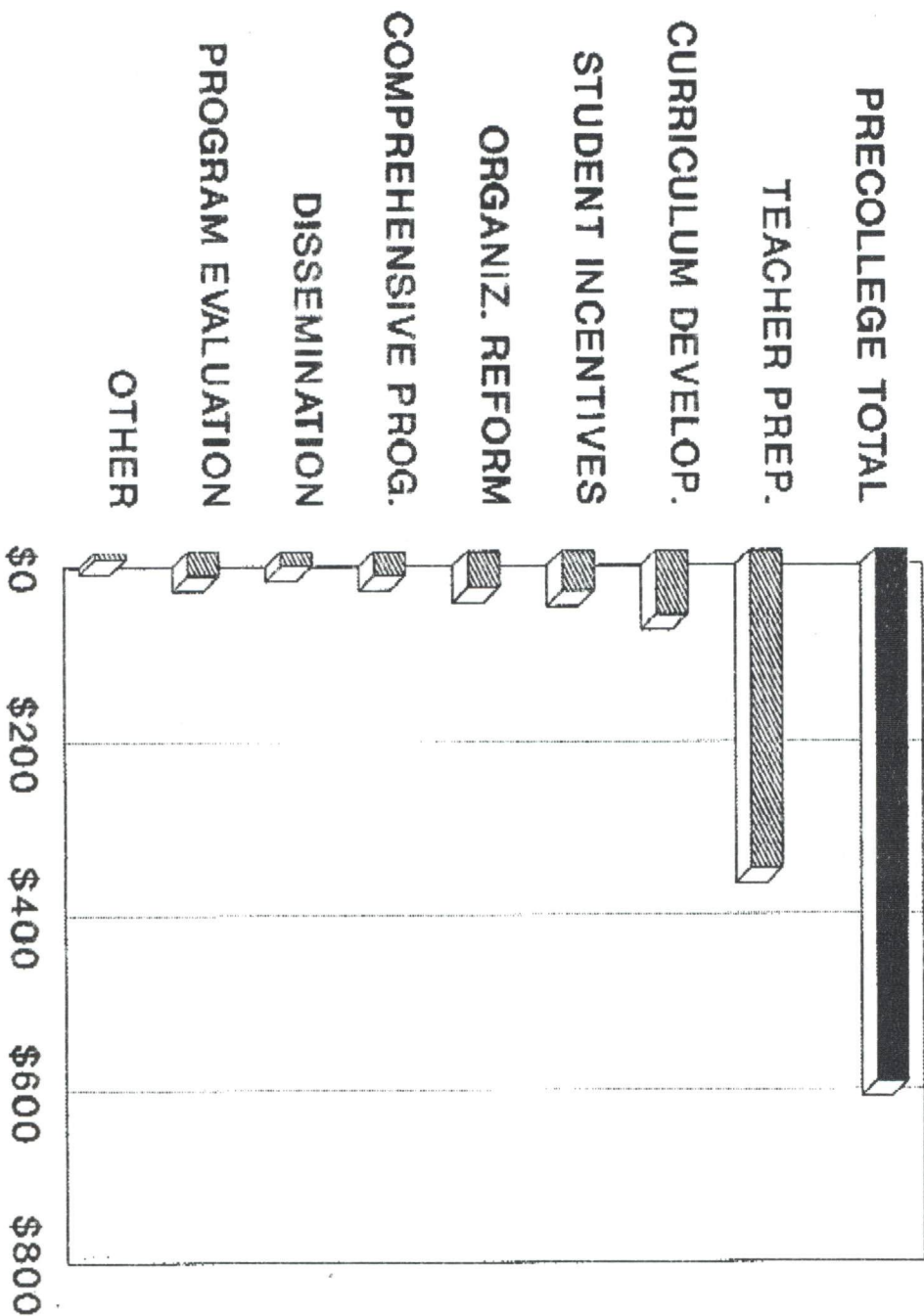
CHART 1
FCCSET CEHR FY 1992 BASELINE
BUDGET CATEGORIES

FCCSET CEHR FY 92 AGENCY BUDGET CATEGORIES



10/28/01
MILLIONS OF DOLLARS

FCCSET CEHR FY 92 PRECOLLEGE PROGRAM ELEMENTS

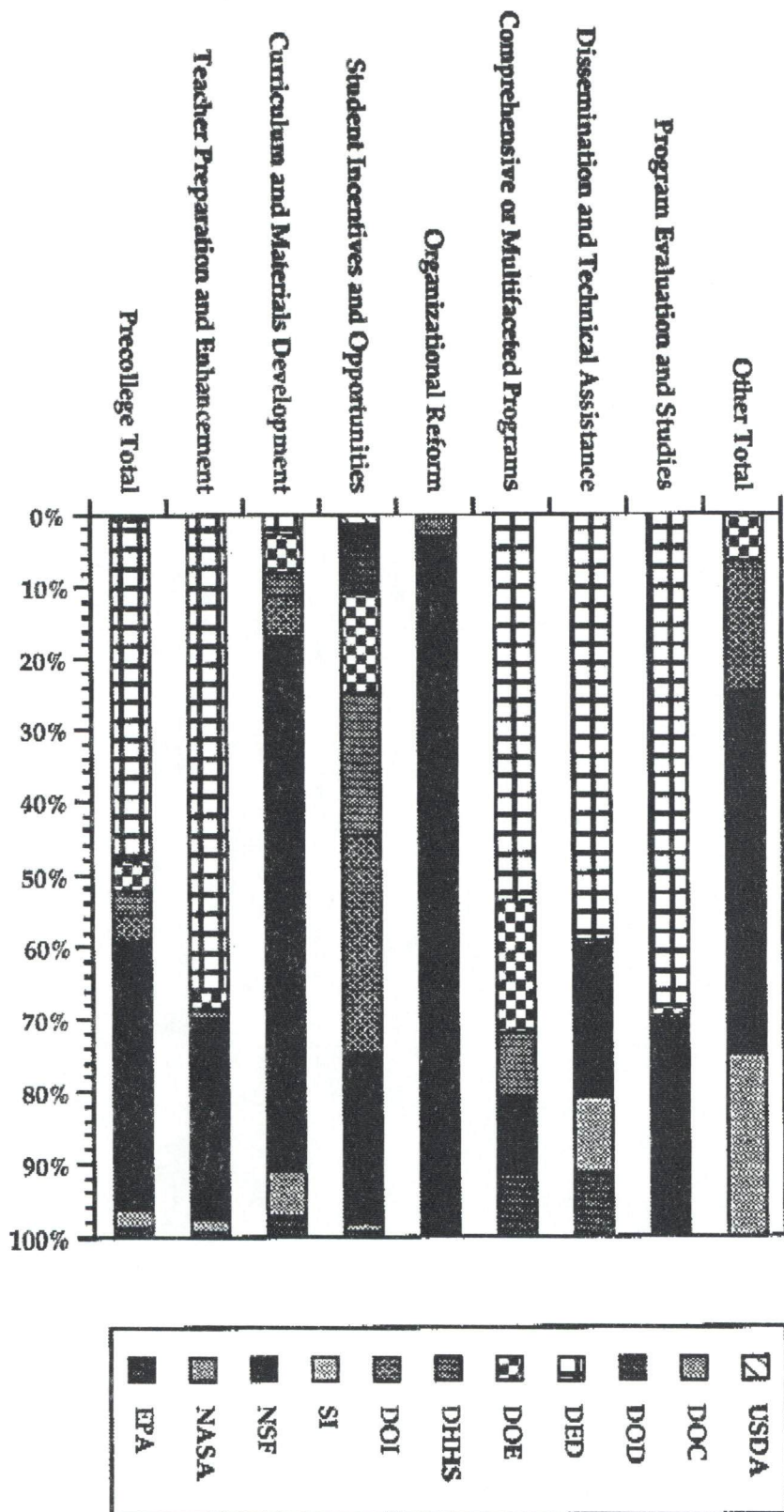


In Millions of Dollars

11/8/92

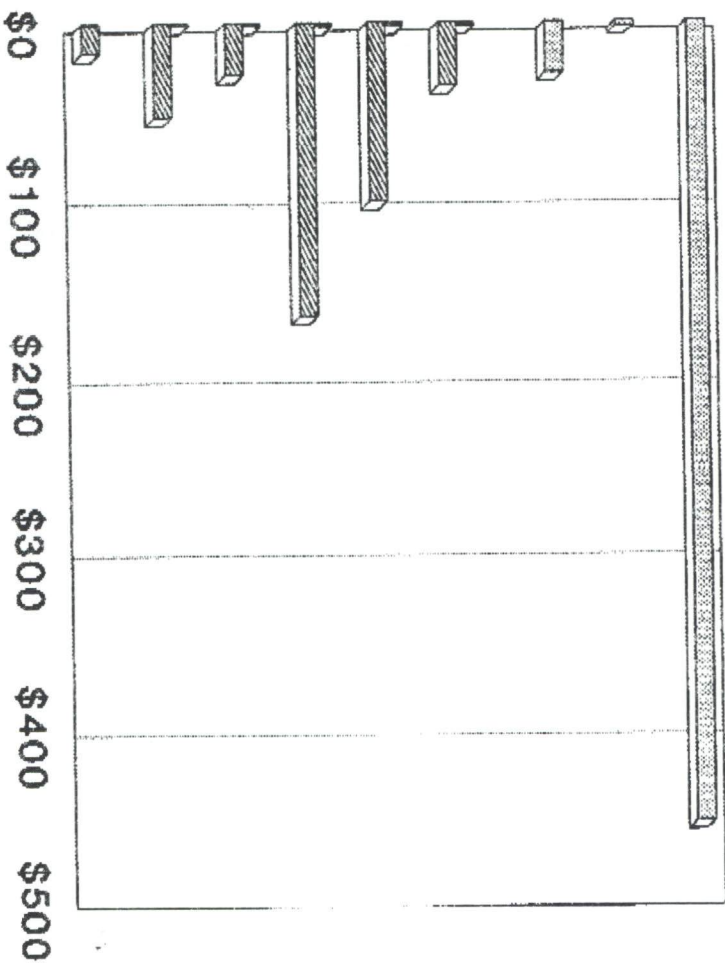
12/8/21

CHART 4
FCCSET CEHR FY 1992 BASELINE
PRECOLLEGE ELEMENTS



FCCSET CEHR FY 92 UNDERGRADUATE PROGRAM ELEMENTS

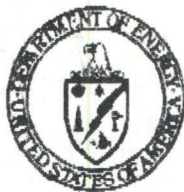
UNDERGRADUATE TOTAL
PROGRAM EVALUATION
EDUCATION TECHNOLOGY
FACULTY PREP
CURRICULUM & MATER.
STUDENT INCENTIVES
ORGANIZATION REFORM
COMPREHENSIVE
OTHER



OVERALL TOTAL
2-YEAR
4-YEAR

MILLIONS OF DOLLARS

13/8/92



DEPARTMENT OF ENERGY
Washington, DC 20585

FCCSET

September 27, 1991

OFFICE OF THE SECRETARY

MEMORANDUM

TO: FCCSET-CEHR MEMBERS
WORKING GROUP MEMBERS

FROM: PEGGY DUFOUR *P. Dufour*
CEHR EXECUTIVE SECRETARY

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4/872

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6/872

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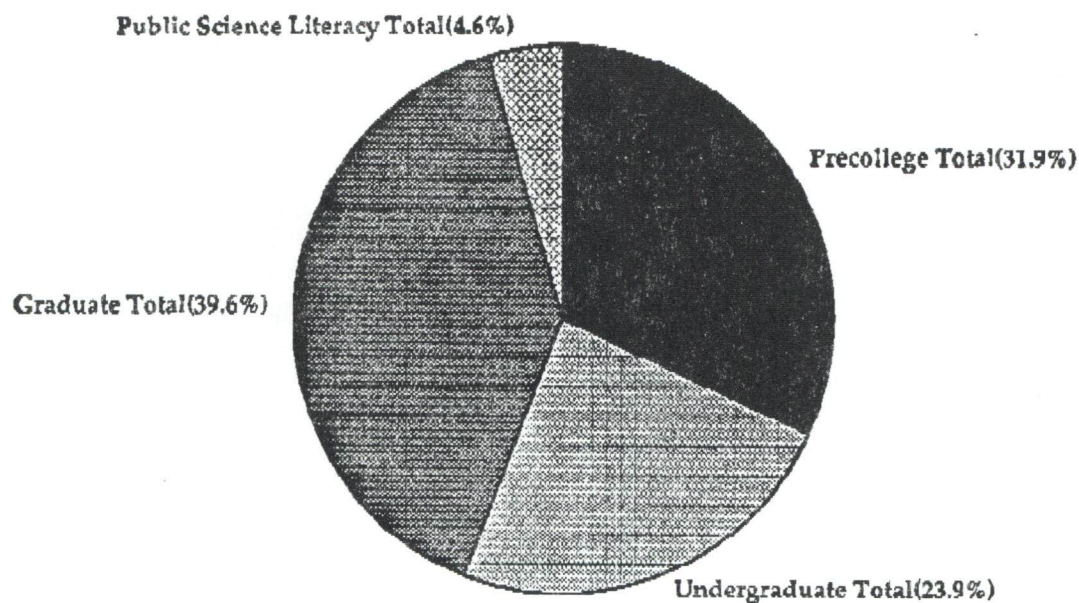
7/872

FCCSET CEHR Budget Table										26-Sep-91	1:05 PM
		1991*	1992	1993	1994	1995	1996	1997			
				Agency Req.							
Total Request		1715.70	1866.39	2123.55	2236.47	2311.10	2388.56	2462.18			
USDA		19.95	18.69	22.65	32.16	42.17	49.18	56.68			
DOC		7.26	3.51	3.67	4.40	5.30	6.10	6.30			
DOD		416.04	378.20	415.97	415.97	415.97	415.97	415.97			
DoED		235.00	296.83	426.03	485.45	500.40	516.19	527.99			
DOE		64.14	109.78	108.13	107.72	111.12	115.23	120.21			
DHHS		486.33	420.14	441.36	454.82	470.73	486.75	502.80			
DOI		40.58	82.73	85.35	85.35	85.35	85.35	85.33			
SI		n/a	9.96	12.53	14.24	14.62	15.01	15.23			
NSF		371.66	456.50	509.12	534.03	557.03	588.05	620.05			
NASA		68.15	76.69	82.27	86.97	92.14	94.57	97.51			
EPA		4.59	13.37	16.47	15.37	16.17	16.17	14.11			
Precollege		514.65	608.53	745.55	814.60	840.65	866.71	898.74			
Undergraduate		416.90	416.07	499.41	534.15	558.33	587.43	605.32			
Graduate		784.15	754.66	788.54	796.27	818.96	840.54	862.67			
Public Science Literacy		n/a	87.12	90.04	92.46	93.16	94.37	95.45			
(millions of dollars)											

*does not reflect rebaselining in FY 92

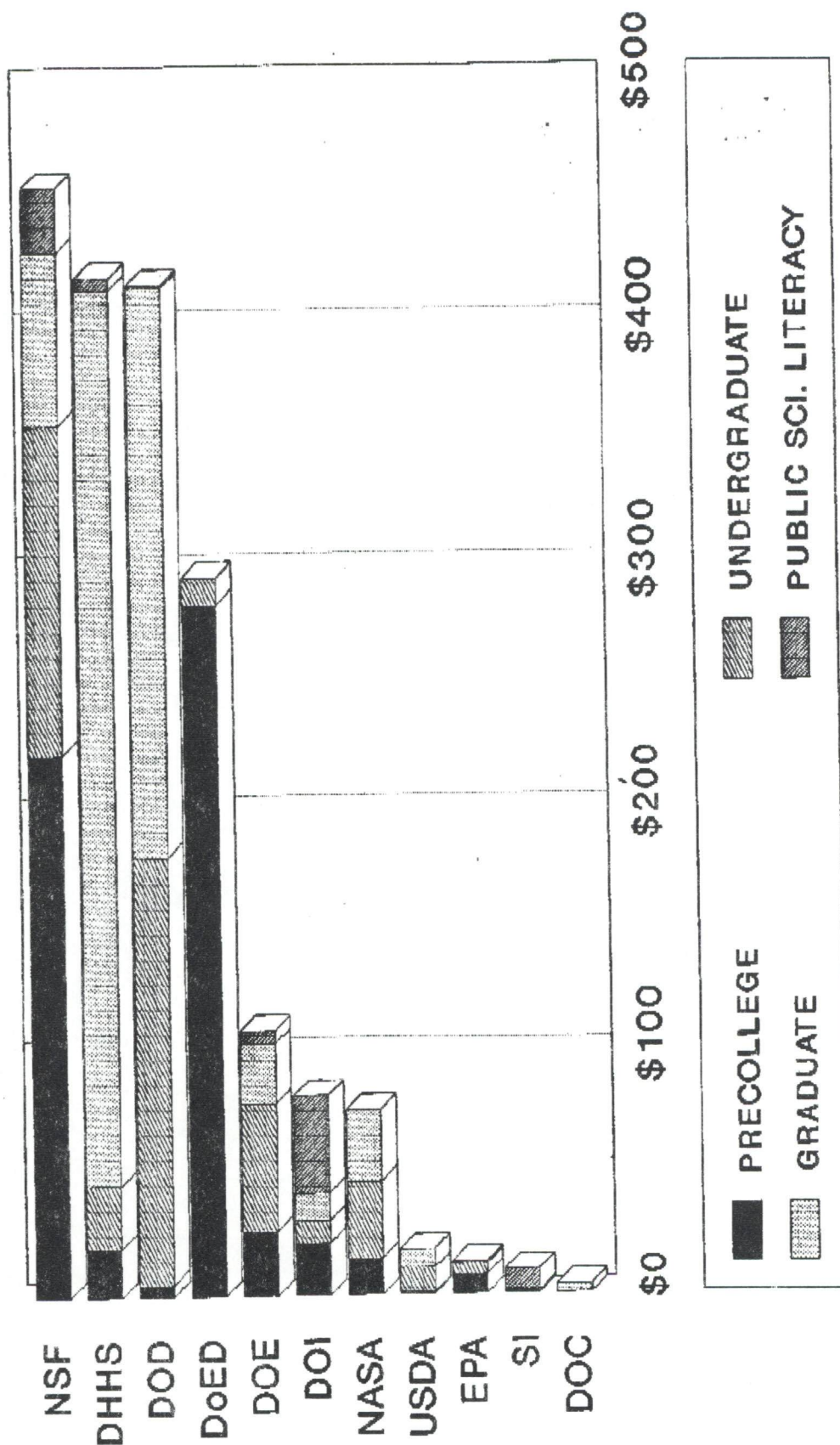
8/872

CHART 1 FCCSET CEHR FY 1992 BASELINE BUDGET CATEGORIES



9/872

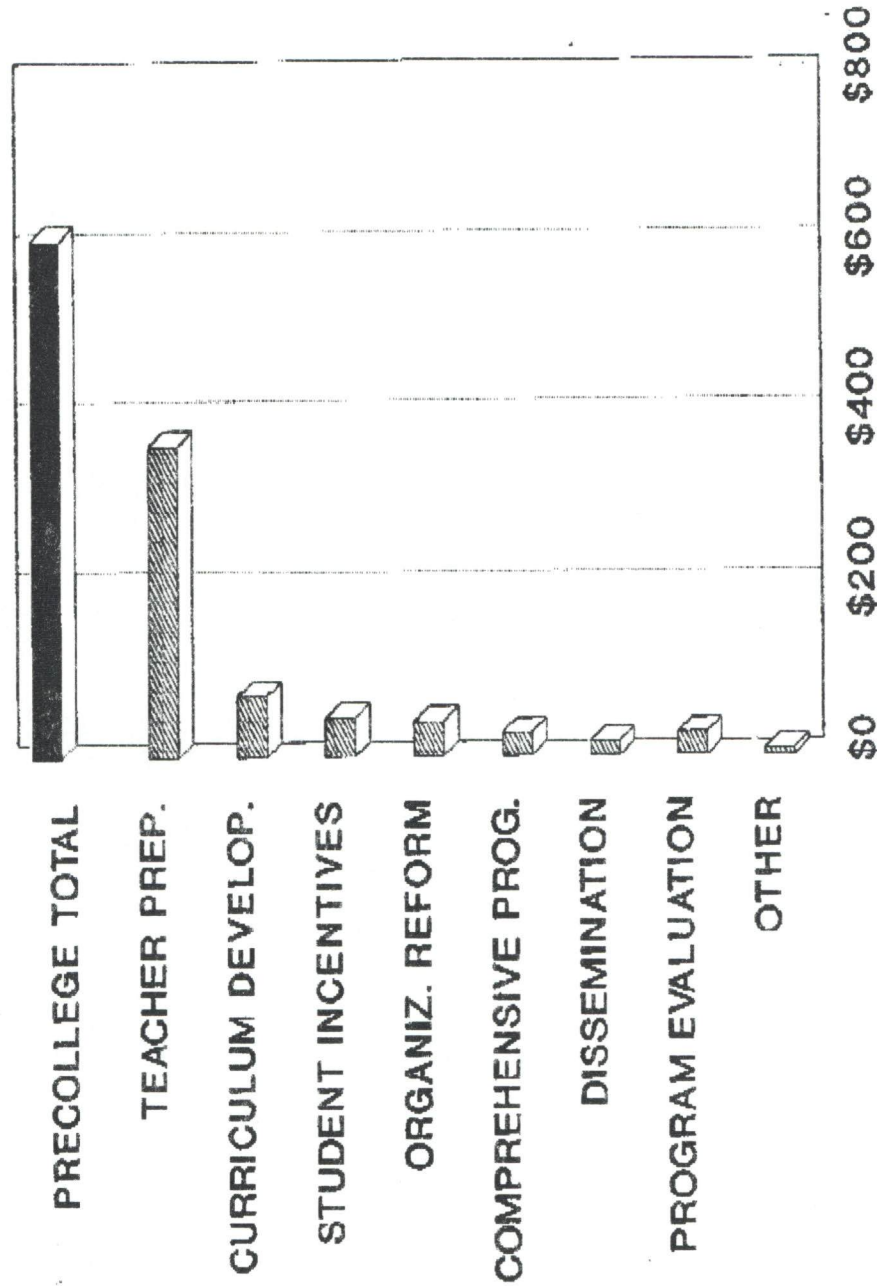
FCCSET CEHR FY 92 AGENCY BUDGET CATEGORIES



MILLIONS OF DOLLARS

10/842

FCCSET CEHR FY 92 PRECOLLEGE PROGRAM ELEMENTS



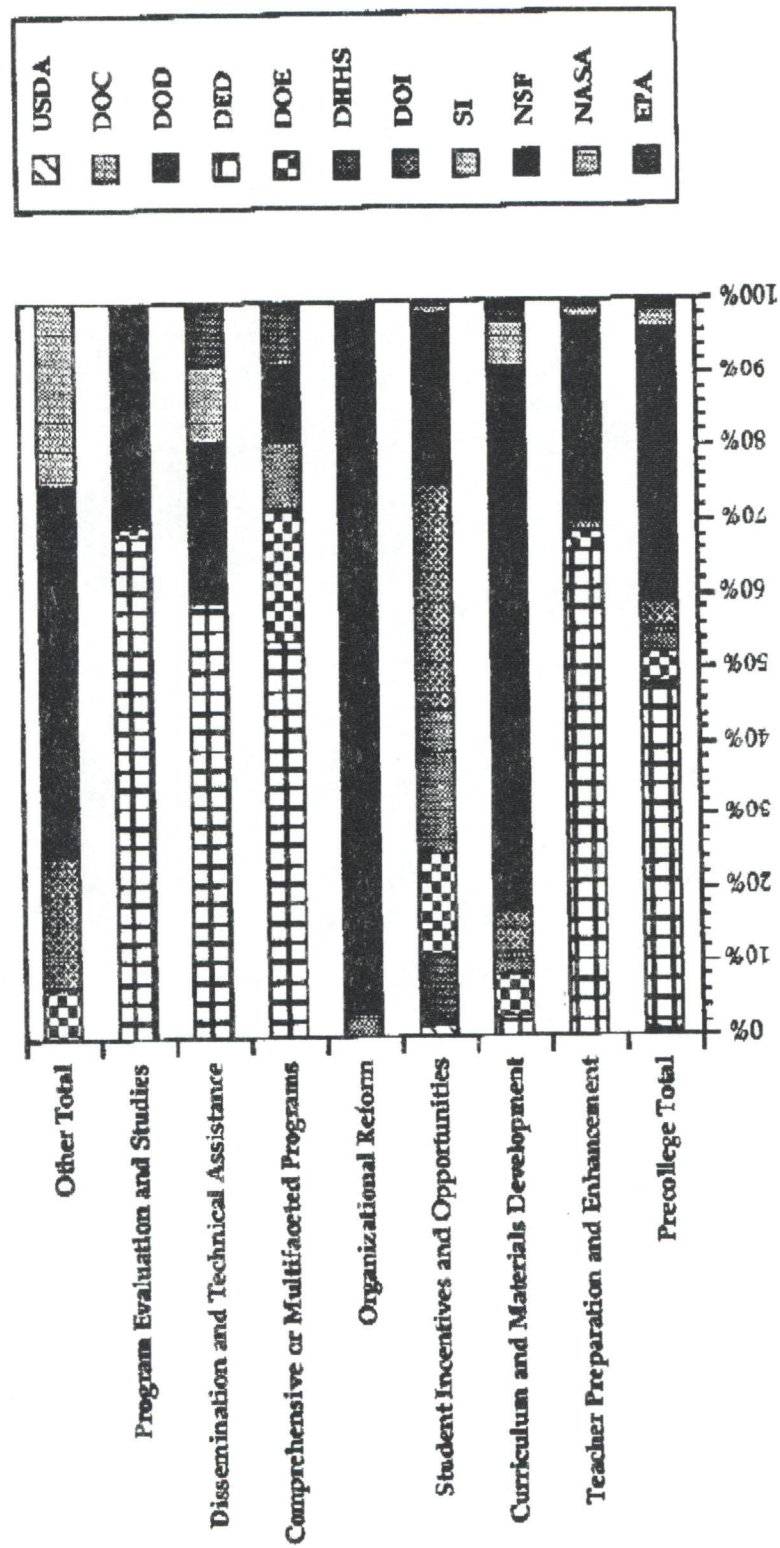
In Millions of Dollars

11/872

CHART 4

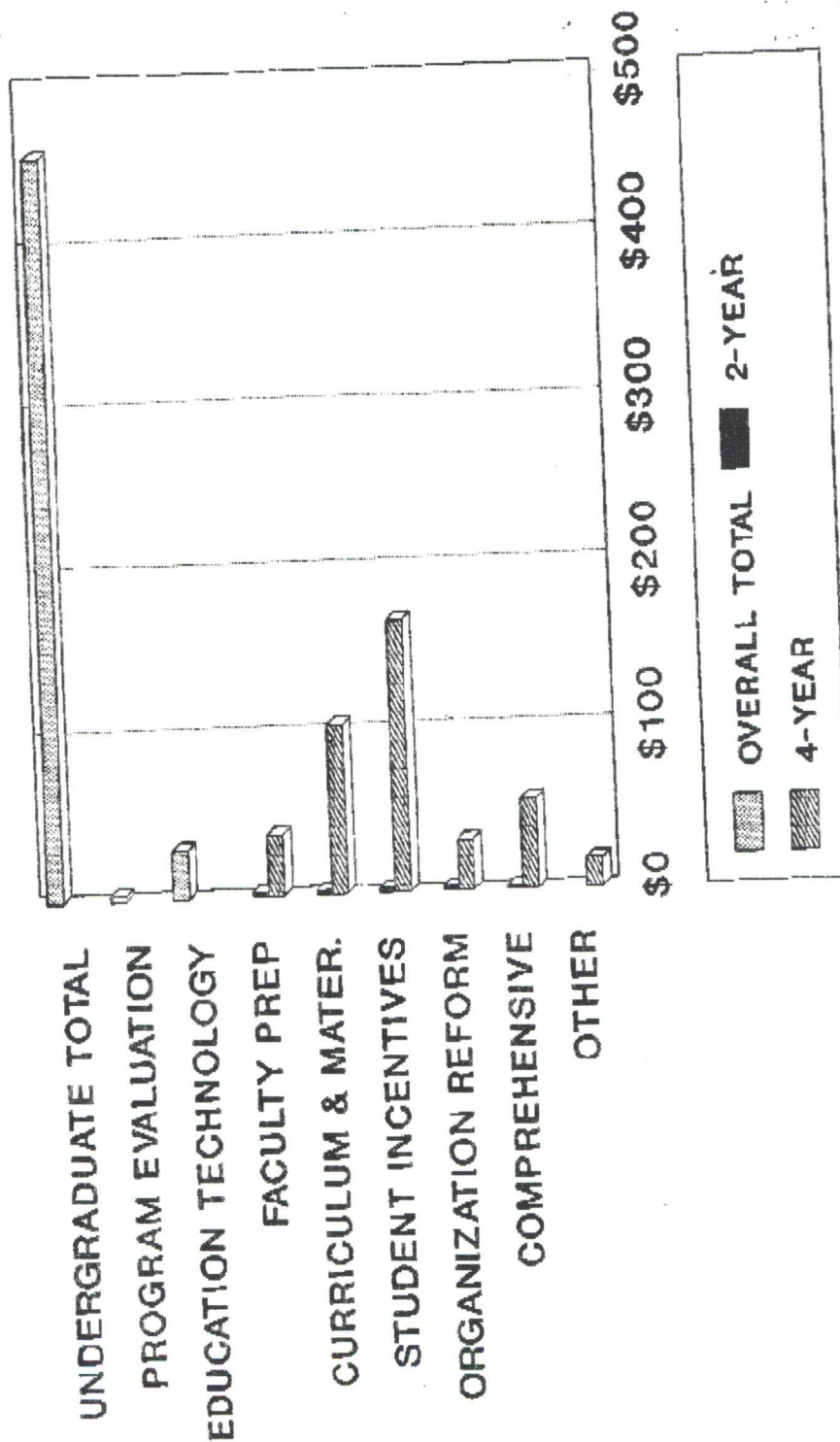
FCCSET CEHR FY 1992 BASELINE

PRECOLLEGE ELEMENTS



12/872

FCCSET CEHR FY 92 UNDERGRADUATE PROGRAM ELEMENTS



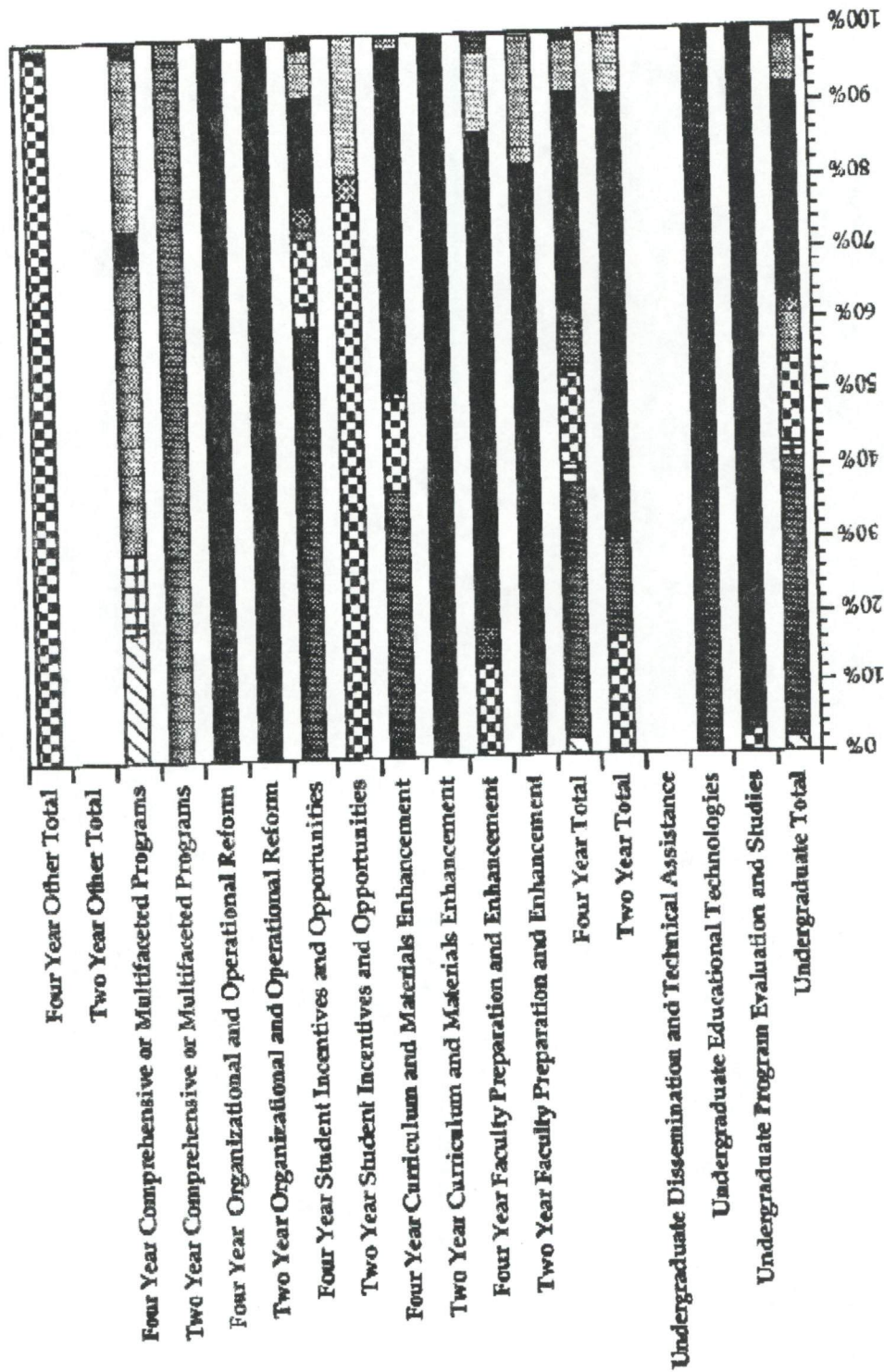
MILLIONS OF DOLLARS

13/872

CHART 6

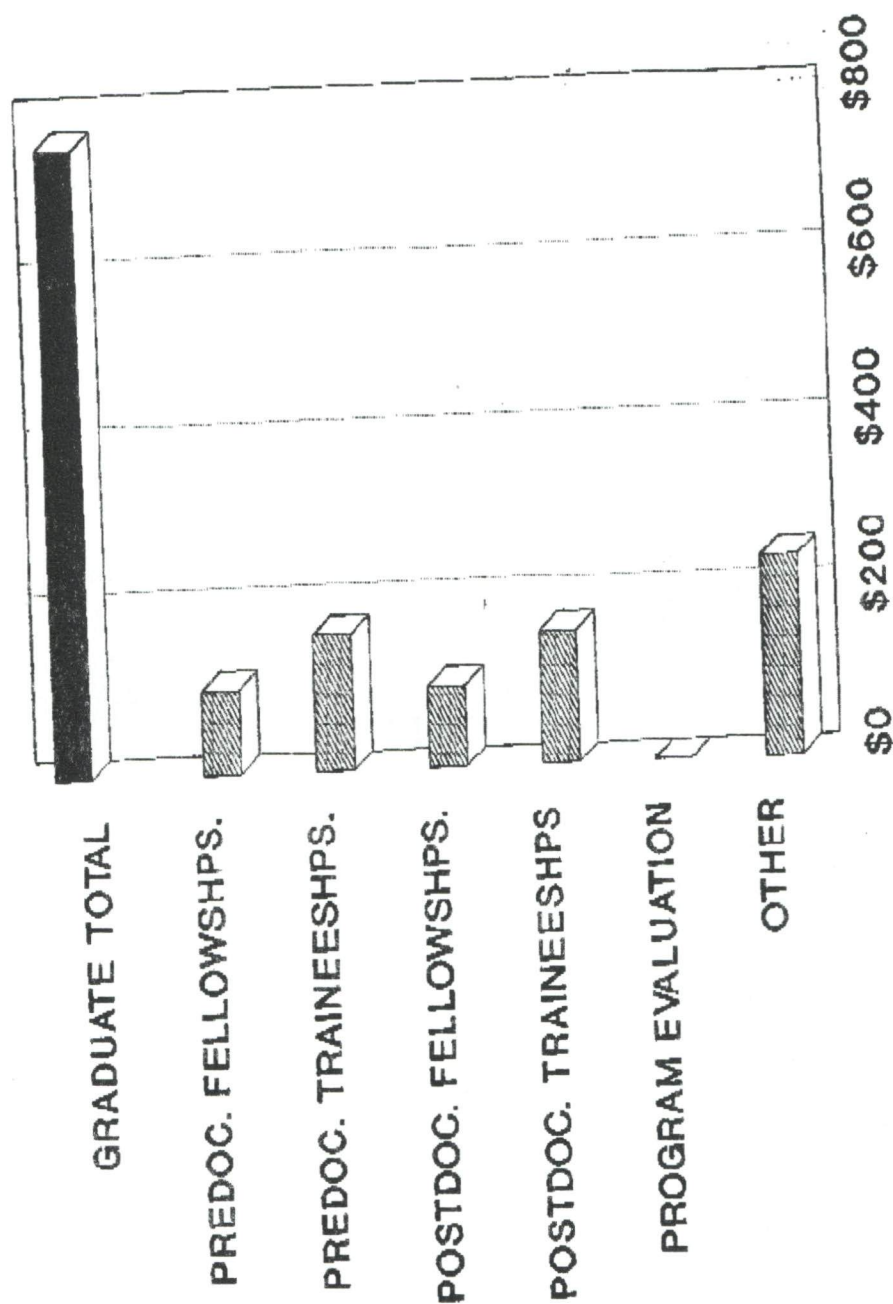
FCCSET CEHR BASELINE

UNDERGRADUATE ELEMENTS



14/872

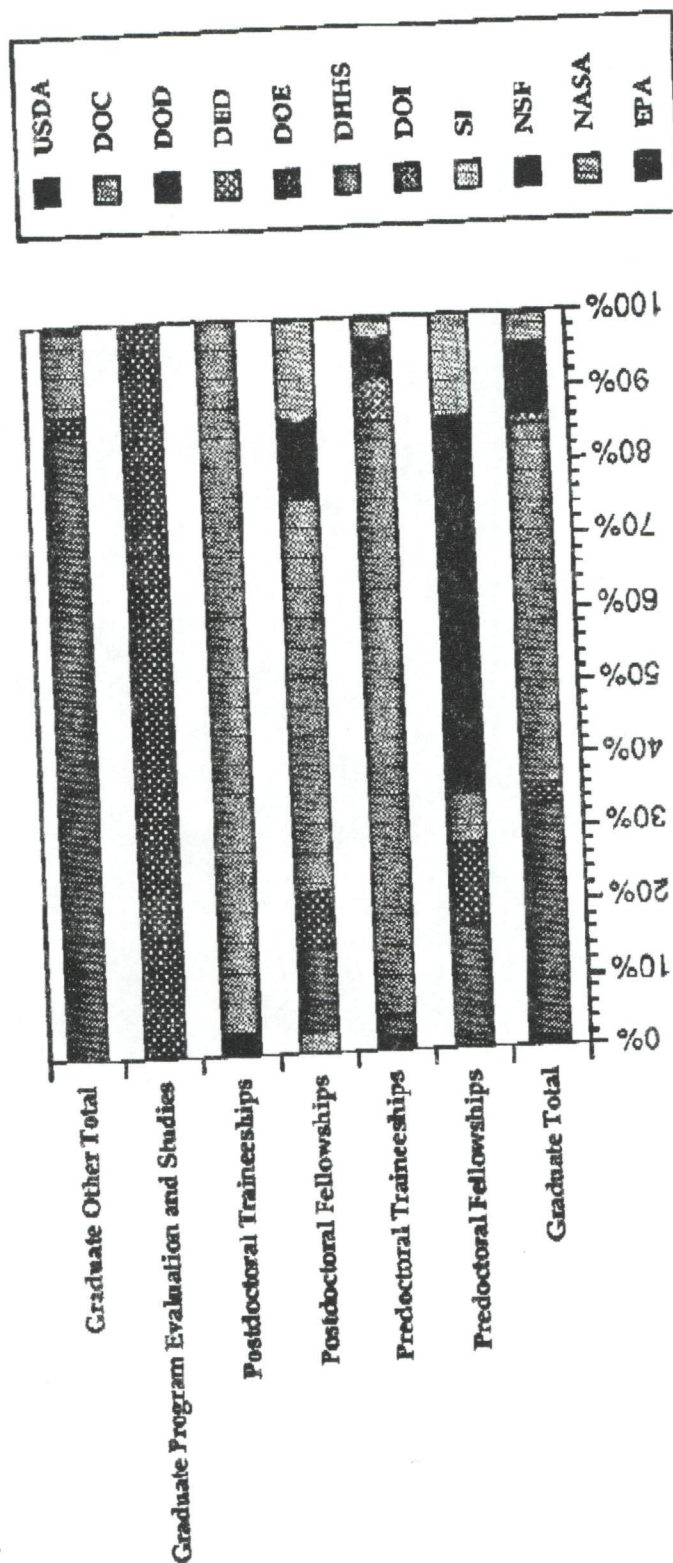
FCCSET CEHR FY 92 GRADUATE PROGRAM ELEMENTS



In Millions of Dollars

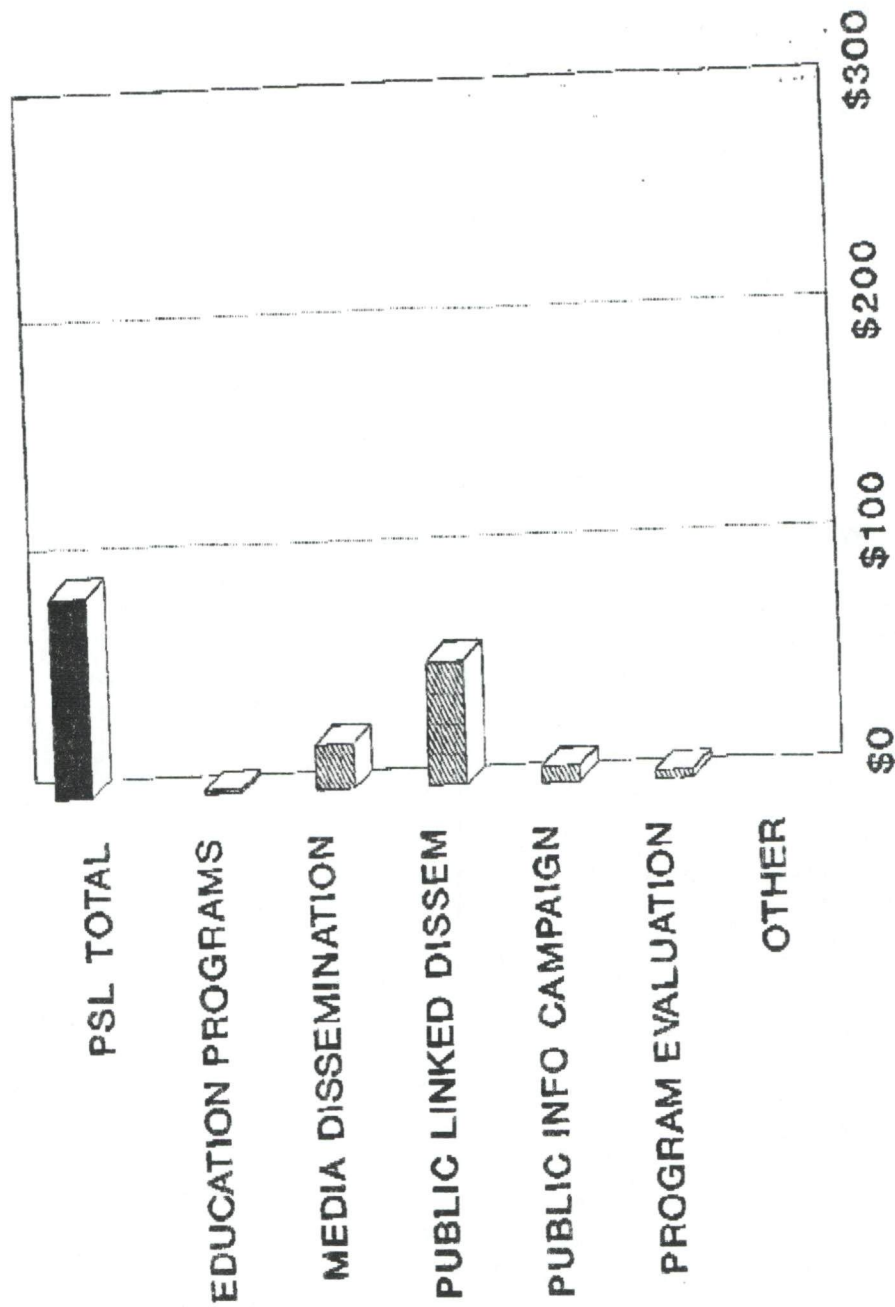
15/872

CHART 8
FCCSET CEHR FY 1992 BASELINE
GRADUATE ELEMENTS



16/872

FCCSET CEHR FY 92 PUBLIC SCIENCE LITERACY PROGRAM ELEMENTS



In Millions of Dollars

17/872

18/872

Public Science Literacy Other Total

Public Science Literacy Program Evaluation and Studies

Public Information Campaigns

Public or Community Linked Dissemination

Media Dissemination

Education Programs for Decision Makers

Public Science Literacy Total

0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

USDA
DOC
DOD
DED
DOI
DHHS
DOI
NSF
SI
EPA
NASA

FCCSET

THE WHITE HOUSE

WASHINGTON

July 15, 1991

MEMORANDUM FOR ROGER B. PORTER

FROM:

CHARLES E.M. KOLB *cmk*

SUBJECT:

The National Science Literacy Goal

I just learned this morning that the FCCSET has developed a new proposed "National Science Literacy Goal" that reads as follows: "By the year 2000, Americans will be scientifically literate and will possess the knowledge and skills necessary to make informed decisions."

I am concerned about this proposed goal for several reasons. First, it has been developed without involving the governors or, as far as I can tell, anyone else outside the Federal government. Second, it duplicates goals 3 and 4 which already emphasize the importance of mathematics and science education. Consequently, it is more likely to confuse people than to inspire them. Third, for the Federal government to support a new goal at this time makes it much harder for us to resist Bingaman, Kennedy, and others who support new goals in civics and foreign languages, not to mention postsecondary education.

I have spoken with OSTP's Tom Ratchford who assures me that there is no intention to have a "new goal" here and that the FCCSET's plan is to promote a strategy for enhancing math/science education and realizing the aims of "America 2000." He said that if this were a problem of "nomenclature" it could be readily fixed.

The next meeting of the group is on July 22, 1991, and will be chaired by David Kearns. I will attend that meeting and, assuming you agree, suggest major revisions in the "National Science Literacy Goal."

Charlie —

You are correctly concerned. Please follow up at the meeting. Their heart is in the right place but we do not need another "national goal" at this time.

Boyer 7-18-91

FACSIMILE TRANSMITTAL SHEET

TO: CHARLES KOLB

FROM: EHR EXEC SEC

DELIVERY TIME: 18-JUL-1991 16:04:44

DELIVERY NODE: 1, DOE

SESSION: 1 - 1226

PAGES: 12 (including this page)

UNCLASSIFIED

DOE F 1325.7
(8/83)

Exception to SF 14, Approved by NARS, June 1978

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U.S. DEPARTMENT OF ENERGY TELECOMMUNICATION MESSAGE (See reverse side for instructions.)		☐ YES ☒ NO													
		3. USE WHEN REQUIRED THIS DOCUMENT CONSISTS OF <u>10</u> PAGES NO. <u> </u> OF <u> </u> COPIES, SERIES <u> </u>													
4. PRECEDENCE DESIGNATION ("X" appropriate box): <table border="1"><thead><tr><th colspan="2">FOR NORMAL USE</th><th colspan="2">EMERGENCY USE ONLY</th></tr></thead><tbody><tr><td>ACTION:</td><td>☐ Routine ☒ Priority</td><td>☐ Immediate</td><td>☐ FLASH</td></tr><tr><td>INFO:</td><td>☐ (6 Hrs.) ☐ (3 Hrs.)</td><td>☐ (30 Mins.)</td><td>☐ (ASAP)</td></tr></tbody></table>		FOR NORMAL USE		EMERGENCY USE ONLY		ACTION:	☐ Routine ☒ Priority	☐ Immediate	☐ FLASH	INFO:	☐ (6 Hrs.) ☐ (3 Hrs.)	☐ (30 Mins.)	☐ (ASAP)	5. TYPE OF MESSAGE ("X" appropriate box) ☐ Single Address ☒ Multiple Address ☐ Title Address ☐ Book Message	
FOR NORMAL USE		EMERGENCY USE ONLY													
ACTION:	☐ Routine ☒ Priority	☐ Immediate	☐ FLASH												
INFO:	☐ (6 Hrs.) ☐ (3 Hrs.)	☐ (30 Mins.)	☐ (ASAP)												
6. FROM PEGGY DUFOUR EXECUTIVE SECRETARY FCCSET-CEHR		7. OFFICIAL BUSINESS <i>Cheryl Kim</i> (Signature of authorizing official) 4:00 (TIME) A.M. P.M.													
8. DATE 7/18/91		9. TO SEE ATTACHED													
10. ORIGINATOR (On separate lines, enter Name, Routing Symbol, & Tel. No.) P: DUFOUR:jc SP-1 202 586-7970		11. DERIVATIVELY CLASSIFIED NSI NATIONAL SECURITY INFORMATION Unauthorized Disclosure subject to Administrative and Criminal Sanctions. Derivative Classifier: (Name) (Title) (Date or Event/OADR) Declassify on: Event/OADR Derivatively Classified by: (Name) (Date or Source Document)													
12. ORIGINALLY CLASSIFIED NSI NATIONAL SECURITY INFORMATION Unauthorized Disclosure subject to Administrative and Criminal Sanctions. Originally Classified by: (Name) (Title) (Date or Event/OADR) Declassify on: (Date or Event/OADR)		13. ☐ RESTRICTED DATA This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Unauthorized disclosure subject to Administrative and Criminal Sanctions. DERIVATIVE CLASSIFIER (Name and Title)													
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BE BRIEF - ELIMINATE UNNECESSARY WORDS

1643

FROM: PEGGY DUFOUR
EHR EXECUTIVE SECRETARY

202 586-9988

586-7970

MEMBERS OF THE FCCSET COMMITTEE ON EDUCATION AND HUMAN RESOURCES

Vice-Chairmen:

DAVID KEARNS (ED)

FAX NUMBER

TELEPHONE

LUTHER WILLIAMS (NSF)

202 401-3093

401-1000

202 357-9813

357-7199

Members:

ANN I. BAY (SI)

202 357-2116

357-2111

TED BERLINCOURT (DOD)

703 697-3762

697-3228

ERICH W. BRETTHAUER (EPA)

202 475-9761

382-7676

CHARLES HESS (USDA)

202 755-7842

447-5923

MARGARET FINARELLI (NASA)

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453-8310

FREDERICK K. GOODWIN (ADAMHA/HHS)

301 443-0284

443-4797

D'WAYNE GRAY (VA)

202 535-8026

233-2455

JOE HEZIR (OMB)

202 395-4817

395-3404

ROBERTS JONES (DOL)

202 523-6827

523-6050

CHARLES E. M. KOLB (OPD)

202 456-2878

456-6515

NANCY H. MASON (DOC)

202 377-4498

377-1091

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202 366-6031

366-9191

WILLIAM G. MYERS (DOJ)

202 514-4699

514-3116

THOMAS RATCHFORD (OSTP)

202 395-3719

456-2894

JOHN E. SCHROTE (DOI)

202 208-5048

208-6182

JACK SOMMER (HUD)

202 401-1246

708-4230

BARRY WHITE (OMB)

202 395-3910

395-4532

2/643

DRAFT

**SIXTH MEETING OF
FCCSET COMMITTEE ON EDUCATION AND HUMAN RESOURCES**

Wednesday, May 22, 1991
2:00 PM - 3:00 PM

Program Review Center
Forrestal Building
U.S. Department of Energy
Washington, D.C.

MINUTES

Admiral Watkins opened the meeting at 2:00 PM. He announced that Mr. Christopher Cross, Chairman of the Working Group on Program Review, would be leaving his position at the Department of Education to work as Executive Director/Education at the Business Roundtable. He thanked Mr. Cross for his work with the Committee over the past year and a half and congratulated him on his new job. He said that Mr. Cross was representative of all that was best in government, that he had served American education and the President well. He said the Committee would look forward to working with him at the Business Roundtable.

Mr. Cross thanked Admiral Watkins for the recognition and said that his work with the Committee had been most rewarding, that the Committee had already accomplished much and was well on its way to following up on its initial successes. He thanked everyone associated with the Committee.

Old Business: Minutes of Previous Meeting

Admiral Watkins then asked the members to review the minutes of the previous meeting and send any changes to the Committee's Executive Secretary by the end of the week.

Old Business: Adoption of D.C. Public Schools in Math and Science

Admiral Watkins moved the Committee on to a discussion of the D.C. public schools. He ran through the prepared fact sheet and partnership report from the Department of Education. He announced that he had met with Secretaries Alexander and Martin about possibly adopting D.C. schools in mathematics and science and had also discussed the project with Secretary Sullivan. They strongly supported the idea.

As a result of these discussions, Admiral Watkins thought that the next step should be to define each of the agencies' capabilities and available resources. He asked the agencies to look closely at their partnership agreements and find the real level of activity that was going on in them and to report back in the next three weeks. He would then meet with the Mayor and D.C. Superintendant and they would try to work out a match with an appropriate district in D.C. The Admiral then stressed that it was important to go into this initiative with no qualms and asked for and received the agencies' agreement.

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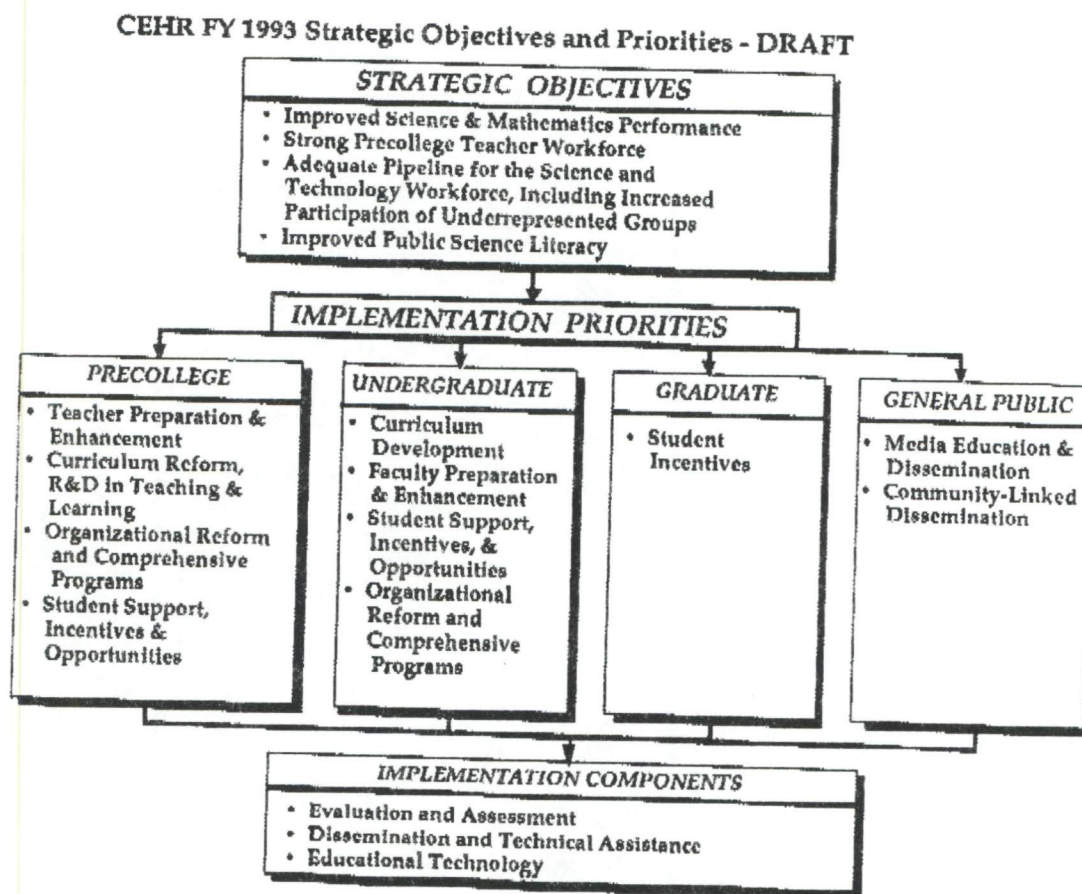
May 22, 1991 FCCSET CEHR Meeting

Dr. Luther Williams said that he applauded the proposed adoption and supported the idea of taking a close look at what the current partnerships were actually doing and what the Committee hoped to accomplish before beginning the project.

New Business: Report of the Working Group on Program Review

Admiral Watkins then asked Mr. Chris Cross to update the Committee on the activities of the Working Group. Mr. Cross announced the group continued to meet weekly and was currently looking at the Strategic Priorities framework for possible changes for the FY 93 budget planning process. The most important proposed changes (see Figure 1) were: the addition of an implementation box for General Public, in order to take into account the new science literacy initiative; an Implementation Components box that affected all the priorities; greater standardization of the subpriorities in each implementation box; and the removal of the arrows that appeared in the previous year's framework in order to show more clearly that many of the subpriorities are integrated with others. Mr. Cross said that they were presenting this for the Committee's consideration and future adoption. He asked that adoption be soon as the framework would determine how the budget data was collected for FY 1993.

Figure 1.



[Note: Precollege includes preschool programs.]

The Committee agreed to the new draft FY 1993 priorities pending further work by the Task Forces.

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May 22, 1991 FCCSET CEHR Meeting

Mr. Cross also announced that the Working Group had formed four task forces--precollege, undergraduate, graduate, and general public (science literacy)--that would be meeting weekly to begin the work of producing a five-year plan for the Committee in each of these areas as required by the draft Terms of Reference. These task forces would report to the Committee in late July so that the Committee could provide program priorities and budget guidance to the agencies in early August.

Admiral Watkins thanked Mr. Cross and said that he was glad to see "media education" in the General Public implementation box as many of the writers covering scientific issues had no formal science training. At a speech he had given to the American Newspaper Publishers Association a few weeks before. He had proposed a summer institute at DOE's National Laboratories for their science writers on complex scientific issues, like global climate change, and he had found the publishers very receptive to the idea. The basic form of the institutes would be presentations by distinguished scientists of peer-reviewed papers to try and keep as much politics out of the process as possible by focussing on what was known and what not known. Dr. Hess mentioned that there was a program similar to what the Admiral was describing for biotechnology.

Dr. Ratchford agreed. He said that part of the problem with general public literacy was that the media and spokesmen typically did not have a scientific or engineering background. He said that he was aware of a program that encouraged scientists to switch careers to media or reporting.

Admiral Watkins stressed that in order to make such a program work, there could be no propagandizing involved. The papers must feel that they owned the program, and he mentioned that the publishers he had discussed the idea with insisted that they pay their own way.

Dr. Goodwin said that HHS had tried a similar program for health science writers. It seemed to work well until problems came up with the editors who took good technical or scientific articles and then oversimplified them before publication in the name of greater public understanding.

Dr. Brown from NASA said that while that might be true, the media had shown in some cases that it could demystify technical subjects. If they could report correct information more often, it would be to all agencies' benefit and he supported the idea of summer institutes. Mr. Cortesi from EPA agreed. He remarked that currently technical subjects are

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May 22, 1991 FCCSET CEHR Meeting

only news when someone says something outrageous about them.

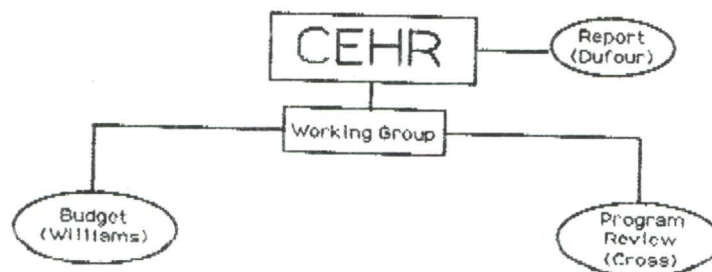
New Business: Improving CEHR Structure

Admiral Watkins then asked that the Committee hear Dr. Ratchford who had some ideas as to how to improve the organizational structure of the Committee. Dr. Ratchford distributed the chart below (Figure 2) for discussion purposes.

Dr. Ratchford took the agencies through his proposal. He said that he felt that it was important that the Committee at least get started on the technical training issue even though the Committee would not be able to carry out the initiative this year. He also asked for comments on a proposal for a task force on Federal schools.

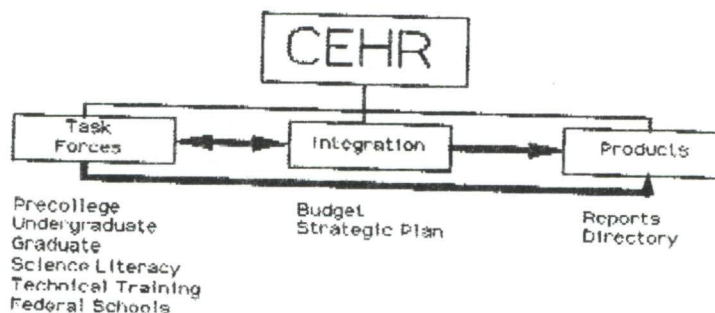
Dr. Ratchford felt that the key to Committee's past success and the way to success in the future was the very substantial involvement of all agencies. He said that it was very important for the agencies to move in parallel. The Committee accepted the proposed table or organization pending further review.

FY 1992 Organization



Proposed Organization

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Figure 2. Dr. Ratchford's proposed organizational structure of FCCSET CEHR for FY 1993 process.
New Business: Terms of Reference

Admiral Watkins then moved the discussion on to consider OMB's draft Terms of Reference (TOR) for the Committee. He summarized the memo sent by Secretary Lujan to OMB Director Darman in two points. First, the dates in the TOR would have to be changed as the draft TOR currently would require budget numbers before some Secretarial officers had even begun their own reviews. The second point was the issue of "fencing" of FCCSET Committee budgets. Secretary Lujan felt that this infringed on the Secretarial Officer's ability to run his own department.

Admiral Watkins agreed with the first of the points, that the dates would have to change. He did not object, however, to the "fencing" requirement. It was the only way the Committee's collective budget work would be meaningful. The sums involved were not that large while the benefits to be gained were. He cited how overwhelmed OMB was by the presentation last year.

Dr. Williams agreed. The important change that needed to be made was the dates. Fencing was necessary. Mr. Cross and Dr. Goodwin agreed that the dates had to be changed.

Mr. Kiko from the Department of the Interior said that DOI had no problems with cooperation or coordination aspects of the Committee. It strongly supported FCCSET and the National Education Goals. It did, however, object to the process which was currently budget-driven, rather than policy-driven.

Dr. Hess said that USDA enjoyed the cooperation and coordination provided by FCCSET. He also felt that in order to gain by the process, each of the agencies would have to give something in return. He felt that providing budget numbers to the Committee before September 3 was possible so long as the numbers were not considered final. Only after passback adjustments were complete should the numbers be considered final. Otherwise, the agencies would have to be explaining to Congress why their requests changed from FCCSET request to the President's submitted request. Admiral Watkins agreed and said that the four Task Forces should proceed this way.

Admiral Watkins then asked Mr. Joe Hezir from OMB to address some of the concerns expressed by the agencies. Mr. Hezir said that for the FCCSET process to work, there had to be coordination through the sharing of numbers before September 3. He said that the July 15 date in the TOR that agencies were objecting to was only intended to begin preparation for the options, that the numbers did not require Secretarial review at that point. Then, in August, the Secretarial officials would have the benefit of taking into account any Committee review done up to that point.

Several agencies then had comments. Dr. Brown from NASA said that it sounded as if there were more flexibility than he had previously thought. He still thought that the July 15 date had to go. Dr. Berlincourt from DOD still had problems with certain time constants

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May 22, 1991 FCCSET CEHR Meeting

in their budget process. They would not have numbers until late October and their summer numbers couldn't even be considered tentative. The Department had tried that last year and the numbers turned out to be not even close. DOD said that incorporating the cross-cuts into the normal budget process this year would help. Ms. Bay from the Smithsonian said that it would be useful to have some budget guidelines from FCCSET in hand when time came for her Secretary's review.

Ms. Dufour suggested that the task forces could pull together general budget guidelines for an early August date. Mr. Cross suggested that the Smithsonian look at last year's report as things would not change too drastically. He also noted that this process would be easier in future years once the strategic plan was in place.

Admiral Watkins said the Executive Secretary and the concerned agencies would work with OMB to redraft the TOR so that both sides could get what they wanted. Dr. Hess suggested that this issue be discussed by the full FCCSET as it was an issue probably generic to each of the Committees. Admiral Watkins thought the issue could be handled by CEHR separately and they would go that route for now.

During the course of the meeting it was announced that the Committee would try to meet in July [subsequently set for July 23] and then once a month after August.

Admiral Watkins thanked all those present for their willingness to come to grips with the tough issues discussed and then adjourned the meeting at 3:15 PM.

Attachments: Agenda

List of Attendees

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May 22, 1991 FCCSET CEHR Meeting

**SIXTH MEETING OF THE
FCCSET COMMITTEE ON
EDUCATION AND HUMAN RESOURCES**Wednesday, May 22, 1991
2:00 PM - 3:00 PMProgram Review Center
Forrestal Building
U.S. Department of Energy
Washington, D.C.**AGENDA**

Admiral Watkins

Old Business

Minutes of April 15, 1991
D.C. Public Schools

Mr. Christopher Cross

New Business

Report of the Working Group
FY 1993 Priorities
Task ForcesDr. Thomas Ratchford
Admiral WatkinsImproving CEHR Structure
FY 1993 Terms of Reference

Discussion

Adjournment

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May 22, 1991 FCCSET CEHR Meeting

FCCSET - CEHR Meeting
Wednesday, May 22, 1991**PARTICIPANTS****Committee Members**Adm. James Watkins, Chairman
Dr. Luther Williams, Vice-Chairman
Dr. Charles Hess
Dr. Frederick Goodwin
Ms. Ann Bay
Dr. Thomas Ratchford
Mr. Joseph Hezir
Mr. John Sommer
Dr. Ted Berlincourt
Ms. Nancy MasonU.S. Department of Energy
National Science Foundation
U.S. Department of Agriculture
U.S. Department of HHS/ADAMHA
Smithsonian Institution
OSTP
Office of Management and Budget
U.S. Department of HUD
U.S. Department of Defense
U.S. Department of Commerce**Representatives of Committee Members not Present**Mr. Chris Cross
Mr. David Duncan
Mr. David Laprade
Ms. Jocelyn Stevenson
Mr. Phillip Kiko
Dr. Bob Brown
Mr. Roger Cortesi
Ms. Gina WillisU.S. Department of Education
U.S. Department of Labor
U.S. Department of Veterans Affairs
U.S. Department of Transportation
U.S. Department of the Interior
NASA
EPA
Office of Policy Development**Committee Staff**Ms. Peggy Dufour, Executive Secretary
Mr. Charles Dickens
Ms. Janice HowellU.S. Department of Energy
OSTP
OSTP**Other Guests**Ms. Maryanne Bach
Mr. Michael Baker
Ms. Jennifer Bond
Ms. Joy Boyer
Ms. Kathy Burchard
Mr. Texas Chee
Mr. Thomas Corwin
Ms. Becky Daiss
Mr. Rick Dalbello
Mr. Danny Gogal
Mr. Milton Goldberg
Mr. Steve Guertin
Ms. Patricia HaynesOSTP
EPA
OSTP
U.S. Department of HHS/NIH
Office of Management and Budget
U.S. Department of Energy
U.S. Department of Education
Environmental Protection Agency
NASA
EPA
U.S. Department of Education
U.S. Department of the Interior
U.S. Department of Transportation

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May 22, 1991 FCCSET CEHR Meeting

Ms. Catherine Hill
Mr. Alden Johanson
Ms. Bonnie Kalberer
Ms. Gwendolyn Lewis
Mr. Joseph McInerney
Ms. Carol-Ann Meares
Mr. Larry Miller
Ms. Henrietta Moody
Mr. Jay Moskowitz
Mr. Michael O'Reilly
Mr. Frank Owens
Ms. Shannon Stuart
Mr. Robert Sullivan
Mr. Richard Stephens
Ms. Jean Vanski
Dr. Ruth Ann Verrell

Department of Energy Staff

Mr. Christopher Hanus
Ms. Maureen Towey
Mr. James Evans

U.S. Department of the Interior
U.S. Department of Transportation
U.S. Department of HHS/NIH
U.S. Department of Agriculture
U.S. Department of HHS/ADAMHA
U.S. Department of Commerce
U.S. Department of Agriculture
U.S. Department of Education
U.S. Department of HHS/NIH
EPA
NASA
U.S. Department of Defense
Smithsonian Institution
U.S. Department of Energy
National Science Foundation
U.S. Department of Energy

Staff Assistant
Staff Assistant
Staff Assistant

THE WHITE HOUSE

WASHINGTON

July 15, 1991

MEMORANDUM FOR ROGER B. PORTER

FROM: CHARLES E.M. KOLB *cmk*

SUBJECT: The National Science Literacy Goal

I just learned this morning that the FCCSET has developed a new proposed "National Science Literacy Goal" that reads as follows: "By the year 2000, Americans will be scientifically literate and will possess the knowledge and skills necessary to make informed decisions."

I am concerned about this proposed goal for several reasons. First, it has been developed without involving the governors or, as far as I can tell, anyone else outside the Federal government. Second, it duplicates goals 3 and 4 which already emphasize the importance of mathematics and science education. Consequently, it is more likely to confuse people than to inspire them. Third, for the Federal government to support a new goal at this time makes it much harder for us to resist Bingaman, Kennedy, and others who support new goals in civics and foreign languages, not to mention postsecondary education.

I have spoken with OSTP's Tom Ratchford who assures me that there is no intention to have a "new goal" here and that the FCCSET's plan is to promote a strategy for enhancing math/science education and realizing the aims of "America 2000." He said that if this were a problem of "nomenclature" it could be readily fixed.

The next meeting of the group is on July 22, 1991, and will be chaired by David Kearns. I will attend that meeting and, assuming you agree, suggest major revisions in the "National Science Literacy Goal."

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FROM: PEGGY DUFOUR
EHR EXECUTIVE SECRETARY

202 586-9988

586-7970

MEMBERS OF THE FCCSET COMMITTEE ON EDUCATION AND HUMAN RESOURCES

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LUTHER WILLIAMS (NSF)	202 357-9813	357-7199

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ERICH W. BRETTHAUER (EPA)	202 475-9761	382-7676
CHARLES HESS (USDA)	202 755-7842	447-5923
MARGARET FINARELLI (NASA)	202 755-3741	453-8310
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D'WAYNE GRAY (VA)	202 535-8026	233-2455
JOE HEZIR (OMB)	202 395-4817	395-3404
ROBERTS JONES (DOL)	202 523-6827	523-6050
CHARLES E. M. KOLB (OPD)	202 456-2878	456-6515
NANCY H. MASON (DOC)	202 377-4498	377-1091
KATE L. MOORE (DOT)	202 366-6031	366-9191
WILLIAM G. MYERS (DOJ)	202 514-4699	514-3116
THOMAS RATCHFORD (OSTP)	202 395-3719	456-2894
JOHN E. SCHROTE (DOI)	202 208-5048	208-6182
JACK SOMMER (HUD)	202 401-1246	708-4230
BARRY WHITE (OMB)	202 395-3910	395-4532

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HENRIETTA MOODY (ED)	202 219-2030	219-1982
THOMAS CORWIN (ED)	202 401-2837	401-0318
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BOB BROWN (NASA)	202 755-2979	453-1110
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MARC G. STANLEY (DOC)	202 377-4625	377-8610
STEVEN NEEDLE (DOC)	202 377-4498	377-8080
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*STEVE GUERTIN (DOI)	202 208-3911	208-3289
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DAVID O. WILLIAMS (DOL)	202 535-0514	535-0690
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KELLY SINCLAIR (EPA)	202 252-0835	382-4600
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(continued)

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JOCELYN STEVENSON (DOT)	202 366-6031 or 366-9654	366-9193
* JERRY WHITE (HUD)	202 401-1246	708-0030
DAVID LAPRADE (VA)	202 535-8026	233-2575
CHARLES DICKENS (OSTP)	202 395-1575	395-5101
JANICE HOWELL (OSTP)	202 395-3719	395-3662
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KATHY BURCHARD (OMB)	202 395-3910	395-5880
NORINE NOONAN (OMB)	202 395-4817	395-3534
RAE NELSON (OPD)	202 456-7739	456-7777
DOREEN TORGERSO (OPD)	202 456-7739	456-6585



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

National Institutes of Health
Bethesda, Maryland 20892

DATE: July 5, 1991

TO: FCCSET CEHR Working Group

FROM: Chair, Task Force of Public Science Literacy

SUBJECT: FCCSET CEHR Public Understanding of Science Strategic Plan

Attached is a draft of the FCCSET CEHR Public Understanding of Science Strategic Plan. The plan is divided into four sections: 1) An overview which contains an introduction describing the approach used by the task force, a statement of National Education Goal #5 and the newly developed Science Literacy Goal, a definition of science literacy, and a list of program planning principles; 2) A three page outline detailing the science literacy program elements and objectives; 3) A listing of Key Activities and Milestones for FY 1991-2000; and 4) An appendix listing each agency's science literacy programs by program element.

The Key Activities and Milestones listed in section three were developed by the Task Force as a result of our review of the agency submissions. They are general in nature and focus on ways in which the agencies can work together to improve public understanding of science. Please examine these recommended actions carefully. Ultimately, each agency will be asked to adopt those actions that are appropriate to its mission and contribute to the funding of the shared activities. Budget estimates are currently being developed by the Task Force and will be included in the final plan.

We will also need to include budget estimates for the programs listed in the appendix. Please review this section and add agencies programs as appropriate. A two or three sentence description of each program should also be included along with a FY 1992 budget estimate. If you provided program information to us before that did not include the description or the budget estimate, please include this information at this time.

Please return your comments and additions to my office by COB July 12. My FAX number is (301) 402-1759. If you have questions or would like more information, please call Bonnie Kalberer or Joy Boyer, (301) 496-0608.

Thank you for your participation in this effort.

Jay Moskowitz, Ph.D.

Attachment

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07-05-91

FCCSET PUBLIC UNDERSTANDING OF SCIENCE - DRAFT STRATEGIC PLAN FY 1993-2000

PART I -- OVERVIEW

INTRODUCTION

Public understanding of science (or public science literacy) is being included as one of the Implementation Priorities of the FCCSET Committee on Education and Human Resources for the first time in FY 1993. In response to this mandate the Task Force is drafting a strategic plan for carrying out the objectives and priorities identified in the Federal Science Literacy Program. This plan is based upon the President's National Education Goal #5 and the FCCSET National Science Literacy Goal. In addition, the CEHR is developing a matrix to collect budget and program information for all existing Federal agency science literacy programs. Although many agencies have programs capable of increasing public science literacy, traditionally these activities have been placed in "informal" education or public affairs categories, and have not been singled out for separate consideration. It is hoped that involvement in the strategic planning process will stimulate agencies to take a fresh look at their existing science literacy programs to: 1) determine how existing programs can be adapted to incorporate science education messages; 2) to expand existing science education efforts so that they reach a broader audience base including special population segments such as the underserved; 3) to identify gap areas where new efforts are needed; 4) to identify areas where cooperative ventures would be productive; and 5) to establish new programs as indicated.

Since public science literacy is a relatively new area of focus, the strategic plan concentrates initially on the development of definitions and identification of existing programs. The committee's initial effort also addresses research into and evaluation of current public perceptions and levels of literacy about science and on identifying effective educational strategies. The results of these assessment activities then will serve as the basis for a comprehensive Public Science Literacy plan to enhance existing Federal program efforts and develop new initiatives and cooperative efforts where needed.

NATIONAL EDUCATION GOAL #5

By the year 2000, 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.

NATIONAL SCIENCE LITERACY GOAL

By the year 2000, Americans will be scientifically literate and will possess the knowledge and skills necessary to make informed decisions.

- Citizens will be capable of understanding and making informed, responsible decisions about the environment, health, energy and other science and educational policy issues that affect everyone in our society.
- Citizens will have a sufficient understanding of science processes and concepts to work and live productively in a technological society.

- Children and youth will be made aware and have a sense of excitement instilled about science and technology; efforts will be made to develop their understanding of the role science and technology plays in almost every aspect of every day life. Concerted efforts will be made to develop their problem solving skills. They will be encouraged to pursue courses, related out-of-school science activities, and careers in science, mathematics and technology.

SCIENCE LITERACY DEFINITION

Science literacy is 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.

A scientifically literate citizen should be able to participate in discussions of contemporary scientific issues, apply scientific information in personal decision making, locate scientific information when needed, and distinguish valid information and sources from those that are not. To be scientifically literate, an individual should possess the skills necessary to understand and evaluate publicly disseminated information on science and technology and interpret graphic displays of scientific information.

Programs for General Public Science Education

General public science education programs are specifically targeted towards increasing the public's 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, the implications for those audiences, and the opportunities for making decisions.

Exclusionary Statement: If a program promotes changing behavior, i.e. through public information, consumer education, or health promotion and disease prevention programs, without offering specific detailed information on the science behind the changes, it should not be considered a science literacy program.

PROGRAM PLANNING PRINCIPLES

In order to reflect the National Education Goal #5 or objectives #1, 2, and 3 under this goal as set forth in America 2000: An Education Strategy and to encourage the widespread adoption of science literacy as a high priority national goal, each agency science literacy programs and projects should incorporate the following principles:

- emphasize demystifying science, teach the public to understand science "as a way of knowing" and to appreciate the critical role of scientists and science to our nation's well-being
- be based upon a sound understanding of current public perceptions and literacy levels in science
- be based upon proven, valid and up-to-date knowledge of scientific principles
- be able to coordinate as appropriate with each State's official science and math learning objectives and with national standards where they exist
- be able to take advantage of each agency's unique resources, including the use of new and developing technologies and proven methods to reach target audiences

- ensure that all segments of the population, especially underrepresented groups, are appropriately addressed in science literacy efforts
- develop linkages between the public and private sector and utilize collaborative efforts whenever possible
- stimulate parents and others to become informed advocates for high quality, universal education in science, mathematics, and technology
- stimulate the formation/utilization of community networks (such as PTA's, churches, YMCA's, libraries, and recreational centers), to encourage and facilitate children and youth science and math endeavors in the home and other settings
- stimulate a variety of out-of-school scientific inquiry activities to ensure the development of each student's problem solving and analytical skills

The Committee believes that it is very important that baseline information be collected early in the planning process both so that progress towards attainment of the national science literacy goal can be measured and the areas of greatest need can be identified. This includes identifying and analyzing existing data on current programs as well as defining the current status of public understanding of basic science and engineering concepts, basic scientific reasoning, and science and engineering-related public policy issues.

PART II -- PROGRAM ELEMENTS and OBJECTIVES

The Committee expects many science literacy programs will consist of collaborative efforts between two or more program elements.

1. **Education Programs for Decision-Makers** - Science literacy programs aimed at educating government, educational, corporate, and media decision-makers about scientific concepts, principles, and issues so that they will be able to make informed professional decisions and aggressively support and promote policies and programs that will help the Nation achieve the national science literacy goal.

Objective: By the Year 2000 all government, educational, and major corporate and media decision makers will formally adopt the national science literacy goal and institute policies and programs to help accomplish the goal.

A. Government - Includes government entities at all levels - national, state and local

Implementation Strategies

- establish concepts and initiatives
- develop programs
- allocate resources
- evaluate progress

B. Educational Policy Makers/Administrators - Includes national, state and local educational administrators, school board members, executive boards of national education organizations and professional societies

Implementation strategies

- help set/update national literacy standards
- help develop effective national educational strategies to accomplish goal, especially for underserved populations
- encourage adoption of science literacy as a top educational priority within educational systems
- encourage development of programs and strategies within educational institutions to attain goal
- develop policies and programs to ensure adequate teacher preparation
- establish/participate in joint efforts working towards goal
- use influence to encourage others to work towards goal
- allocate resources to accomplish goal
- help evaluate progress towards goal

C. Corporate - Includes all major companies (Initially Fortune 500)

Implementation Strategies

- encourage and assist workers to acquire new knowledge and skills and to adapt to emerging new technologies and methods
- institute programs to assist employees and their families to become scientifically literate
- establish linkages between corporations and educational institutions
- develop initiatives in communities the corporation serves
- join efforts of others to attain goal

- use influence to encourage others to work towards goal
- provide support for national, regional and local science literacy programs
- evaluate progress towards goal

D. Media - Includes print, broadcast and film

Implementation Strategies

- aggressively encourage goal within organization
- encourage increased depth of coverage of important science issues
- encourage increased number of issues covered
- ensure accuracy of information
- encourage increased effort to explain underlying principles
- strive to heighten public awareness of important issues
- spearhead national/local efforts to work towards goal
- establish policies to make available the scientific and personnel resources of Federal laboratories to work with media
- help evaluate national progress towards goal

2. Media Programming - Mass media-based programs that provide scientific information for increased public awareness and knowledge and help change the public perception of science

Objective: By the year 2000, the number of media programs which educate the public about scientific concepts, principles, and issues will double.

Implementation Strategies

- ensure accuracy of information disseminated
- place more emphasis on explaining underlying principles of issues
- assume leadership role in community for striving towards goal
- use innovative ways to educate public
- make special efforts to reach underserved groups
- make special efforts to instill an interest in science in youngsters
- subtly include educational goals in entertainment programming
- assist public in increasing decision-making skills
- use new technology for interactive experiences
- encourage public to seek and use additional sources of information
- join partnerships working towards goal
- help keep everyone informed on progress towards goal

3. Public and Community Linked Programs - Public and community-based programs that incorporate science education into activities of daily life and promote better understanding of the importance of science and scientific research. These programs include museum and library exhibits, science and technology center programs, Federal laboratories, Veterans Administration and city hospitals, park nature programs, public lectures, and youth-group programs.

Objective: By the year 2000, the number of public and community-linked programs (libraries, museums, science centers, youth programs, national park programs, etc.) that formally adopt the national science literacy goal and institute policies and programs to support the goal will double.

Implementation Strategies

- assume community leadership role
- initiate/join group ventures working towards goal
- make special efforts to reach underserved populations
- make special efforts to instill an interest in science in youngsters
- increase effort to teach underlying scientific principles
- help ensure accuracy of information disseminated in community
- aggressively utilize new technology to achieve goal
- make special effort to build decision-making skills; teach how to make informed judgements
- evaluate progress towards goal

4. **Public Information Campaigns--Science Education Components** - Specialized segments within larger public education campaigns that are specifically targeted towards increasing scientific knowledge and understanding of scientific principles.

Objective: By the year 2000, the number of public information campaigns that incorporate science education components will double.

Implementation Strategies

- make special efforts to reach underserved populations
- make special efforts to reach youngsters
- should consist of joint efforts of many organizations
- make special effort to enlist mass media help
- recruit valued role models to take leadership roles
- make messages meaningful and valuable to targeted audience; audience must see payoff for them
- ensure information is accurate
- use various strategies to reinforce message
- evaluate progress towards goal

5. **Clearinghouse, Hotlines, Individual Information Sources--Science Education Components** - Information sources that can be accessed by individuals to educate themselves on the science behind personal concerns and current issues.

Objective: By the Year 2000, the number of personal information sources that formally adopt the national scientific literacy goal and institute policies and programs to help accomplish goal will double.

Implementation Strategies

- assist clients to understand underlying principles
- help clients develop skills to make informed judgements
- help monitor accuracy of other information sources on topic
- make special efforts to reach underserved populations
- make special efforts to help youngsters understand information and underlying principles
- help clients find and use other information sources
- work with others to accomplish goal
- evaluate progress towards goal

PART III -- FY 1991 to 2000 MILESTONES and KEY ACTIVITIES

The following is a summary of key activities and milestones by year for FY 1991 through 2000 with agency or CEHR Committee responsibility for implementation indicated at the end of each activity. Brackets [] indicate lead agency or group; however, all Departments and Agencies are expected to contribute resources, including financial, to each activity and milestone.

Note: Costs associated with key activities and milestones are being developed by the Task Force and will be incorporated into the final draft.

FY 1991

- Develop goal, objectives, definitions of terms and outline of science literacy program elements as well as the overall outline for the strategic plan. [CEHR]
- Inventory existing Federal programs; continue existing science literacy efforts [All agencies]

FY 1992

- Refine definitions and inventory, identify gaps where new efforts are needed and areas where cooperative government-wide and government/private sector efforts can be productive. [CEHR]
- Hold public hearings to gather information on level of science literacy and effective educational strategies. [DOE]
- Develop and advertise Work Scopes for Research and Development Contracts to:
 - a. Examine what is known about current levels of scientific literacy in the general public and specific population segments; review existing research and data and expand as required
 - b. Identify effective public science literacy education strategies for various segments of the public with special emphasis on reaching underserved populations; explore role of new technology for these efforts
 - c. Determine ways that science education can more effectively be incorporated into existing public information activities [ED]
- Begin efforts to educate and enlist decision makers
 - a. Agency Secretaries or designees meet with the nation's governors to enlist their support [FCCSET]
 - b. Agency Secretaries issue policy statements recommending the incorporation of science education components into all public information campaigns [All agencies]
 - c. Identify key members of Executive and Legislative branches whose actions affect policy at the national, state and local level [ED &/or NSF]
 - d. Agency Secretaries or their designees address national meetings of educational and university administrators [All agencies]

FY 1993

- Award research and development contracts [ED]
- Continue efforts to reach decision makers
 - a. Convene workshops/Task Forces of media and government representatives to discuss the role of media to increase public science literacy; explore use of non-traditional and new technology for science literacy efforts; develop plans and programs for media involvement. [CEHR]
 - b. Agency Secretaries or their designees meet with top corporate leaders to enlist their support and explore options for industry participation both for upgrading science literacy skills of their workforce and contributing to public science literacy efforts. [All agencies]
- Inventory and examine all existing public information activities and materials (print and film), clearinghouse activities, exhibit materials, electronic bulletin boards, etc. to:
 - strengthen existing science components or incorporate new science education components;
 - reach a broader range of audiences especially underserved populations; and
 - develop a plan to make revisions. [All agencies]
- Identify and recruit regional science literacy spokespersons for community programs; develop speakers bureaus. [All agencies]
- Begin conducting evaluation of existing programs [All agencies]
- Begin development of new programs to fill gaps [All agencies]

FY 1994

- Review results of Inventory and R & D contracts and develop comprehensive public science literacy action plan based on previously adopted goal, objectives, program elements and implementation strategies. [CEHR]
- Begin implementation of new programs and expand program development activities. [All agencies]

FY 1995 - 2000

- Aggressive implementation of comprehensive public science literacy strategic plan. [All agencies]

APPENDIX A**EXISTING FEDERAL AGENCY PROGRAMS
Public Understanding of Science**

1. EDUCATION PROGRAMS FOR DECISION MAKERS. Science literacy programs aimed at educating government, educational, media and corporate decision-makers about scientific concepts, principles, and issues so that they will make informed professional decisions and also aggressively support and promote the science literacy goal.

Agency Programs that contribute to the objective (list with brief description and FY 1992 budget estimate)

A. Government - Includes government entities at all levels - national, state, local

USDA

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HHS

o Congressional Information Luncheons

A series of luncheons featuring distinguished scientists from government, academia, and industry to familiarize members of Congress and their staffs with current biomedical research concepts and issues. Shared cost between HHS (FY 1992 estimate \$) and private sector.

o Non-animal Methods In Biomedical Research and Development--What They Do and Do Not Do."

This program is a joint effort by DHHS and the Partners In Discovery--a group of 15 private, research-based pharmaceutical companies and organizations--to develop a brochure that explains the limitations of non-animal tests in biomedical research and development. The brochure will offer accurate, understandable information for the general public. (FY 1992 estimate \$)

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- o "NSF Days"

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- o National Biodiversity Conference
- o Oceans
- o Capital Hill Workshops
- o Forums for Media, Policymakers, and Scientists
- o Rainforest forum
- o EXXON Conference
- o National Academy
- o Computer World

- B. Education** - includes national, state and local educational administrators, school board members, executive boards of national education organizations and professional societies

Agency Programs that contribute to this objective (list with brief description and FY 1992 budget estimate)

USDA

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- C. Corporate** - Includes all major companies (Fortune 500)

Agency Programs that contribute to this objective (list with brief description and FY 1992 budget estimate)

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D. Media - Includes print, broadcast and film

Agency Programs that contribute to this objective (list with brief description and FY 1992 budget estimates)

USDA

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o National Institutes for Science Writers and Publishers

These institutes will cover such issues as global climate changes (FY 1992 estimate \$)

HHS

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- o Annual Briefings and Workshops for Science News Directors run by Scientists' Institute for Public Information Central Washington University Seminars and Resource.

SMITHSONIAN

2. **MEDIA Programming.** Programs that utilize the mass media (broadcast, print and film) to provide scientific information for increased public awareness and knowledge.

Agency Programs that contribute to this objective (list with brief description and FY 1992 budget estimates)

USDA

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DOE

- o Futures

This PBS series, hosted by Jaime Escalante, shows students how mathematics principles are utilized in "real life" career settings. (FY 1992 estimate \$)

HHS

- o The Future of Medicine PBS Series

This PBS series will be developed by WNET/THIRTEEN and AHCPR for national broadcast in 1992. The series will explore the sweeping changes taking place in medicine. The quality, appropriateness, and effectiveness will be addressed in the course of the broadcast. (AHCPR: FY 1991--\$200,000, FY 1992--\$200,000, NCHGR/NIH FY 1991--\$200,000) No projected actions or costs for FY 1993 and beyond.

- o The Health Century

This PBS series, developed in conjunction with the Partners in Discovery, examines the scientific process and the progress made in medical discoveries, treatments, and technologies in the past century. A companion book, published by Doubleday & co., was a Book-of-the-Month Club selection, and a high school science curriculum has been developed around the four-part series. A precollege curriculum supplement was developed from this program and is currently being evaluated for wider distribution. No projected actions or costs for FY 1992 and beyond.

- o **Windows into the Brain**

This is a multimedia exhibit designed to provide information on specific biobehavioral research activities about the brain. Projects in this initiative dovetail with the Presidentially declared "Decade of the Brain" and offer opportunities to educate citizens about frontiers of research in the neurosciences. Alliances will be formed among universities and community colleges, foundations, local organizations, and industry, including television, museums, and professional organizations.

- o **Drugs and the Brain**

Funding has been allocated for the development of a prime-time TV special targeted to 8-12-year-olds and their parents which will be produced by the Children's Television Workshop. The program will depict scientific research and explore life science career options, using neuroscience research to illustrate the process. Additional materials will be developed, based on the program, for use in the classroom, and the National Science Foundation may cosponsor related community outreach projects.

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- o IMAX Films (Youth and Adults). Examples: Tropical Rainforest, "Cosmic Voyage"--Concepts of space and time in the universe.

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- o Radio Smithsonian
- o Air and Space magazine
- o Smithsonian magazine
- o Research Reports (newsletter)
- o Television specials
- o Smithsonian Minutes (television spots on natural sciences)
- o Press conferences and news releases on science exhibitions and programs
- o Smithsonian Press books (popular series)
- o PawPrints (newsletter)
- o Zoogoer magazine
- o Smithsonian Newservice (distributes SI-based articles to newspapers nationwide)

3. PUBLIC & COMMUNITY-LINKED DISSEMINATION. Public and community-based programs that relate science education to activities of daily living and promote better understanding of the importance of science and scientific research. These programs include museums and library exhibits, science and technology center

programs, Federal laboratories, Veterans Administration and city hospitals, park nature programs, public lectures, and youth-group programs.

Agency Programs that contribute to the objective (list with brief description and FY 1992 budget estimate)

USDA

DOC

DOD

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HHS

o **Animal Research: The Search for Life Saving Answers**

In an attempt to inform the public of the benefits derived from animal research and the critical need for this research to continue to find methods to prevent and treat diseases, ADAMHA has developed a wide variety of materials for the general public, including: presentation packages for scientists wishing to conduct workshops at conventions and professional meetings, information brochures for the general public, and classroom materials for teachers and students and the general public.

o **Ethical, Legal and social Implications (ELSI) of Human Genome Research Program**

Funding program which supports public education projects (e.g., for town meetings, public television, etc.), conferences, research grants, and curriculum development projects (secondary school level) on social implications of genome research. The goal of the NCHGR's program is to develop the safeguards that will be required as new genetic information is put to practical uses.

NIH-DOE Working Group on the Ethical, Legal and Social Implications of Human Genome Research: Working group publishes public reports and hosts local community discussions of social implications of genome research.

o **Medicine for the Public**

This series, now in its 15th year, features physician-scientists working at the frontiers of medical research at the National Institutes of Health. The series helps people understand the latest developments in medicine--new therapies, diagnostic procedures, and research. The emphasis is on current topics, with colorful graphic slides designed to complement each lecture and speakers who can relate to the lay public. This series also provides videotapes, booklets, and fact sheets on the topics covered in the lectures. Six lectures are held each year at an estimated total cost of \$10,000. Approximately 500 people from the lay public attend each lecture. This lecture series may be shortened in FY 1993 and future years due to budget cutbacks.

o **National Museum of Health & Medicine**

This museum has been called a "National Treasure" and "perhaps the greatest medical museum in the world." The Museum stood on the National Mall in Washington, D.C., from 1888 to 1968, where nearly one million visitors a year viewed its photographs, historic

artifacts, anatomic specimens, and the most comprehensive microscope collection in the world. The museum is currently being redesigned to increase its visibility and accessibility. Interactive exhibits will be emphasized with a focus on such topics as medical technology and social history, human diet and nutrition, substance abuse prevention and AIDS education. The NIH is currently considering, at the direction of Congress, assuming the administrative responsibility for the Museum. Meanwhile, negotiations are underway to locate the museum in the Hubert Humphrey Building.

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- o Projects in Museums of Natural History and Nature Centers. Examples: "Exploring the Blue Planet" (Scripps Hall of Oceanography); "Our Weakening Web: The Study of Extinction" (Cincinnati Museum of Natural History); "Global Warming" (American Museum of Natural History); and "Darkened Water: Profile of an Oil Spill" (Homer Society of Natural History).

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- o Permanent exhibitions in natural and physical sciences--National Museum of Natural History (NMNH), National Museum of American History (NMAH), National Zoo, National Air and Space Museum, and Smithsonian Tropical Research Institute.
- o Nature Trails--Chesapeake Bay Center for Environmental Studies (CERC) and Smithsonian Tropical Research Institute (STRI).
- o Science demonstrations in all of the above museums and the Zoo.
- o Temporary exhibitions.
- o Specialized learning facilities at NMNH, NMAH, NZP, NASM--includes Planetarium, Naturalist Center, Zoolab, Langley Theater (IMAX), and more.
- o Docent-led "Highlights Tours" of Mall museums.
- o Free films, lectures, and related public activities.
- o Lectures, seminars, courses, and other activities offered to members through Resident and National Associate programs.

4. PUBLIC INFORMATION CAMPAIGNS - SCIENCE EDUCATION COMPONENTS. Specialized programs within larger public education campaigns that are specifically designed to increase scientific knowledge.

Agency Programs that contribute to this objective (list with brief description and FY 1992 budget estimates)

USDA

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HHS

- o Health Promotion/Disease Prevention Campaigns. These campaigns provide an invaluable service to the citizens of this country; however, they are not being fully utilized as vehicles for improving the science education of our citizens. In FY 1992 and 1993, HHS will examine these public information campaigns to determine ways that science education messages can be incorporated into existing materials and will also examine the development of new science education materials or curriculum supplements based on these information campaigns.

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- o National Science and Technology Week (NSTW). Program Components include: Learning Packages; Graphics Materials; Media Dissemination; Teacher Training Workshops; Partnerships/Alliances.

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5. CLEARINGHOUSES, HOT LINES, INDIVIDUAL INFORMATION SOURCES - SCIENCE EDUCATION COMPONENTS. Information sources that can be accessed by individuals to educate themselves on the science behind personal concerns and current issues.

Agency Programs that contribute to this objective (list with brief description and FY 1992 budget estimates)

USDA

DOC

DOD

ED

- o ERIC - The ERIC Clearinghouse on Science, Mathematics and Environmental Education, located at Ohio State University, acquires and indexes curriculum and instructional materials, teaching materials, educational programs, research and evaluation studies, and media and computer applications. In 1990 this Clearinghouse responded to nearly 14,000 information requests from the public. The 16 ERIC Clearinghouses provide a variety of services and products to help educators and others stay up-to-date on a broad range of issues. ERIC publications include practitioner-oriented Digests, research summaries, literature reviews and bibliographies; the Clearinghouses also provide reference and referral services, user workshops, and computer searches.
- o The Clearinghouse on Science, Mathematics and Environmental Education plans a publication on "The Development of Environmental Literacy," to explore the elements of environmental literacy as a necessary facet of citizenship education, in particular what citizens need to know in order to understand environment-related choices confronting individuals and society.
- o The April 1991 issue of The ERIC Review addresses "Issues in Adult Literacy Education." While traditional definitions of literacy have focused on basic reading and writing skills, the report comments that more recently literacy has been defined in broader and more functional terms. In addition to reading and writing, functional literacy involves oral communication, computational, problem-solving, and decision making skills, reflecting ways in which individuals use literacy skills to perform tasks in the home, the community, and the workplace.
- o The Science and Math Clearinghouse has recently published a Digest on "Meeting National Goals for 2000 and Beyond in Science Education," another useful document for educating decision makers on issues in science literacy and the state of science education nationally.

DOE

HHS

- o As a part of its health promotion and disease prevention programs, HHS has a variety of clearinghouses, hotlines, and individual information sources. These sources of information offer a unique opportunity to enhance the science literacy of the general public. In FY 1992 and 1993, HHS will examine these mechanisms to determine ways that science education messages can be incorporated into existing materials.

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- o Individuals in curatorial divisions who answer inquiries by mail and telephone about many different science subjects.

NATIONAL SCIENCE FOUNDATION
1800 G STREET, N.W.
WASHINGTON, D.C. 20550

FCCSET

Directorate for Education
and Human Resources

Dear Evaluation Forum Guest:

We are pleased to enclose an edited summary of remarks from our March 18, 1992 seminar on issues in Federal program evaluation. We felt it was important to obtain feedback from the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET) panelists before mailing to you. In addition, Professor Scriven has rewritten his notes extensively. Thank you for your patience.

Should you have any comments or suggestions, please feel free to send them to me at the National Science Foundation; Division of Research, Evaluation, and Dissemination, 1800 G Street, N.W., Washington, D.C. 20550.

I would like to alert you to the Dissemination Forum that is now in the final planning phase, scheduled to be held at the ASAE Building, 1575 Eye Street, N.W., on Friday, December 4, 1992. The organizer of this event is our new Program Director for Dissemination, Dr. Don Ely, who is on leave from Syracuse University.

More details on the Dissemination Forum will be available from Don in the near future.

Again, thank you for your participation in the Evaluation Forum.

Sincerely,



Kenneth J. Travers
Division Director
for Research, Evaluation
and Dissemination

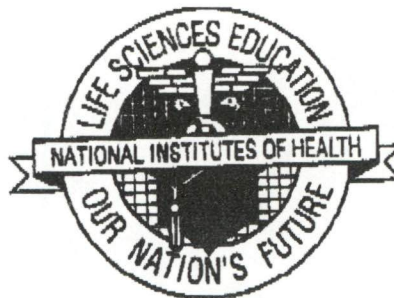
enclosure

She -
Thought this might
interest you.
Regards -
CEMK

FCCSRT

OFFICE OF SCIENCE EDUCATION POLICY

NATIONAL INSTITUTES OF HEALTH
9000 Rockville Pike
Building 31, Room 3B19
Bethesda, MD 20892
Phone: (301)402-2469
Fax: (301)402-3034

TELEFAX TRANSMITTAL

no.
Can't
make it.
C. Kolb

DATE: 8-17-92TO: Peggy Smith / Chas KolbNUMBER OF PAGES INCLUDING COVER PAGE: 5

FROM: Robin Fisher.

REMARKS: Will you be able to attend?

"LIFE SCIENCES EDUCATION -- OUR NATION'S FUTURE"



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

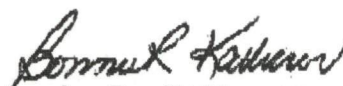
National Institutes of Health
Bethesda, Maryland 20892

Date: July 24, 1992
To: FCCSET CEHR Members
From: Chair, Public Science Literacy Subgroup
Subject: Expert Forum on Public Understanding of Science

The Science Literacy Subgroup of the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), Committee on Education and Human Resources (CEHR) is sponsoring an Expert Forum on Public Understanding of Science. The purpose of the forum is threefold: to come to consensus on the working definition of public understanding of science; to begin planning for an extensive consensus development conference on the topic (identifying specific questions and participants); and to obtain expert review and comment on the subgroup's interim strategic plan. The forum, being held in Alexandria, Virginia, will last one and a half days and is scheduled for all day August 20, 1992 and the morning of August 21.

We are planning on a group of about 25 participants including the subgroup members, CEHR representatives, and 10-12 "experts" of varying philosophical viewpoints and professional backgrounds. A tentative agenda and participant and FCCSET Subgroup lists are attached for your information.

A very lively and thought provoking debate is expected; an exchange of ideas that will enable the subgroup to carry out its FCCSET mission much more effectively.


Bonnie R. Kalberer

Attachments

July 24, 1992

EXPERT FORUM - PUBLIC UNDERSTANDING OF SCIENCE Participants

Moderator

Dr. Audrey Champagne
Dept. of Chemistry
SUNY
Albany, NY

Dr. Jon Miller
Director, Public Opinion Laboratory
Northern Illinois University
DeKalb, IL 60115
(815) 753-0555

George Tressal
11121 Powder Horn Dr.
Potomac, MD 20854
(301) 299-9594

Dr. Henry Lewis
Dean Pharmacy & Health Sci
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Dr. Iris Weiss
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(919) 493-7589

Shirley Malcolm
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Dr. C. Kumon Patel
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(908) 582-3245

Dr. Daryl Chubin
Senior Analyst
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Sheila Grinell
Information Science Education
86 Sherman Ave.
Teaneck, NJ 07666
(201) 692-8245

Dr. Paul Saltman
Dept. of Biology
University of California - San Diego
La Jolla, CA 92093
(619) 534-3824

Dr. Robert Hazen
George Mason University
Carnegie Geophysical Laboratory
5241 Broad Branch Rd
Washington, DC
(202) 686-2470

Dr. Alan Freidman
New York Hall of Science
47-01 111th Street
Corona, NY 11368
(718) 699-0675

Joan Barlotto
USA Today
1000 Wilson Blvd.
Rosslyn, VA 22209
(703) 276-3400

Expert Forum August 21, 1992

Friday 9:00-10:00

Session IV - Identifying Potential Consensus Development Conference Participants

- ♦ Who should be on the panel?
- ♦ Who should present?
- ♦ Who else should be invited?

Coffee Break 10:00-10:15

10:15-1:00

Session V - Review and Comment on Current Interim FCCSET CEHR Public Understanding of Science Strategic Plan

1:00 Wrap-up

T E N T A T I V E

July 24, 1992

**FCCSET - CEHR PUBLIC UNDERSTANDING OF SCIENCE EXPERT FORUM
AGENDA**

August 20-21, 1992

66 Canal Center Plaza * Suite 200 * Alexandria, VA

Thursday 9:00-10:15

Session I - Presentations (10 minutes each): What is Public Understanding of Science?

- ♦Dr. Jon Miller
- ♦George Tressel
- ♦Sheila Grinell
- ♦Dr. Alan Friedman
- ♦Dr. Robert Hazen

Coffee Break 10:15-10:30

10:30-12:30

Session II - Roundtable Discussion: What is public understanding of science?

- ♦How has it been defined to date? How should it be defined?
- ♦Can it be measured? If so, what are the standards?
- ♦Why is it important?
- ♦Should standards for PUNS be linked to school curriculum?
- ♦Should it be integrated into community programs?

Lunch Break 12:30-1:30

1:30-3:30

Session II continued

Coffee Break 3:30-3:45

3:45-6:00

Session III - Identifying Consensus Development Conference Questions - What are the critical issues?

- ♦Goal - What should be the national public understanding of science goal(s)? What should be the time frame? What can be achieved by the year 2000?
- ♦Standards - What are they? Can we measure them? If so, how?
- ♦Evaluation - How do we know we are making progress?
- ♦Strategies - What are the best strategies for achieving public understanding of science?
 - Role of government, academia, media, industry, other
 - Use of new technologies

3155T

FACSIMILE COVER SHEET



NASA HEADQUARTERS
OFFICE OF THE ADMINISTRATOR

(Use of the NASA Seal authorized for the Administrator's Office Only)

June 9, 1992

DATE: _____

TO: CEHR Members

FROM: NASA/Angela M. Phillips

A handwritten signature in dark ink, appearing to read "Angela M. Phillips", is written over the "FROM:" line.

SUBJECT: CEHR Interim Strategic Plan

Enclosed is the CEHR Interim Strategic Plan which was submitted to the Chair and Vice-chairs on June 8, 1992. This plan will be the topic of discussion at this afternoon's CEHR meeting.

Originals with supporting documentation are being hand-delivered to your office this morning. If this material is not delivered by 11:00 a.m. this morning, please contact my office immediately.

Enclosure

MEMORANDUM

UNITED STATES DEPARTMENT OF EDUCATION
OFFICE OF THE ASSISTANT SECRETARY
FOR EDUCATIONAL RESEARCH AND IMPROVEMENT

JUN 8 1992

TO: David Kearns Luther Williams
Vice-Chairs
Committee on Education and Human Resources

FROM: Milton Goldberg *Conrad K. Goldberg for*
Chairman
Strategic Plan Working Group

SUBJ: Interim Strategic Plan

On behalf of the Strategic Plan Working Group (SPWG), I am pleased to submit the Interim Strategic Plan. This Interim Strategic Plan represents a strong consensus among members of the Strategic Plan Working Group.

The purpose of this plan is to guide agencies as they develop their programs and budget requests for FY 1994-98. Response to such guidance could include, but need not be limited to (1) program expansion, redirection, and/or enhancement and (2) development of new activities. Program activities should be guided by agency missions, as well as an agency's potential for making significant contributions, based on expertise and available resources. In this process, it is not reasonable to expect all agencies to function in each program area.

In addition to the Strategic Plan Working Group, this plan reflects the work of the seven Sub-Groups and over 80 staff of the member agencies who participated on those Sub-Groups. Their reports were submitted to the SPWG for consideration. The SPWG has built on these reports and has developed a set of recommendations it believes reflect a balanced yet focused plan for the Federal government's role in achieving the National Education Goals. The seven draft Sub-Group reports are attached as background information. These reports will be the subject of further deliberations in preparing the final Plan.

With the completion of the Interim Plan, the SPWG is now prepared to move to activities that will permit us to prepare the final Plan. Special consideration will be given to Sub-group recommendations and other activities of CEHR agencies that did not have immediate budgetary implications but are central to the Leadership role the Federal government must play. The final Plan will be submitted September 8, 1992.

**Federal Coordinating Council for Science,
Engineering and Technology
Committee on Education and Human Resources (CEHR)**

**Interim Strategic Plan
FY 1994 - FY 1998**

INTRODUCTION

Science and technology are essential to the Nation's well-being, as well as the quality of life for our citizens today and in the next century. Accordingly, America's performance in mathematics and science must be second to none--in the laboratory, the classroom, and the workplace. Further, our citizens must be equipped to make informed decisions in this age of technology, information and communications.

The role of the Committee on Education and Human Resources (CEHR) and its member agencies is to provide leadership in advancing mathematics, science, engineering, and technology education by developing:

1. Priorities for Federal support of efforts designed to improve and maintain world-class mathematics, science, and engineering education at all levels, from kindergarten through postgraduate;
2. Interagency cooperation and collaboration;
3. Strong linkages between Federal agencies and individual States, colleges and universities and the private sector promoting excellence in mathematics, science and engineering education; and
4. Model programs to make better use of Federal resources and to transfer successful models to the education community.

CEHR EDUCATION STRATEGY

The strategy addresses the entire educational continuum, i.e., the precollege, undergraduate, and graduate education levels, and public science literacy, while also supporting the National Education Goals and AMERICA 2000. The four components are interdependent; they 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 meeting the relevant National Education Goals and in particular Goal 4: By the Year 2000, American students will be first in the world in science and mathematics achievement.

The strategy addresses the challenges to U. S. economic strength and well-being from increasing international competition. Each component offers unique challenges and requires that attention be

Tier I Priorities: Formal System Change

Tier I priorities target system reform at the elementary and secondary levels; revitalization of lower-division undergraduate education; and evaluation of Federal programs at all education levels. The Federal agenda must capitalize on the synergy among all program elements and, to meet demands for measurable improvements by decade end, activities must be undertaken in parallel.

-- Elementary and Secondary: System Reform --

Standards for Curriculum, Teaching, and Assessment. The Federal government will support (1) development of curriculum, teaching, and assessment standards, through consensus, thus delineating the content and skills that both students and instructors must master; (2) development of State, district, and private frameworks for guiding schools in the implementation of these established standards; and (3) development and adoption of assessment procedures and tools for monitoring student performance and improving instructional strategies and materials. Successful accomplishment of the foregoing will require active leadership on the part of CEHR agencies.

Milestones:

- o Provide support and incentives to facilitate the highly desired outcome that, by 1995, all States and school districts adopt the National Council of Teachers of Mathematics (NCTM) mathematics standards.
- o In 1994, science curriculum standards will have been completed with support from ED; teaching and assessment standards will be developed with support of NSF. CEHR strongly urges consensus building with the scientific, education, and other communities to ensure adoption of these standards.
- o Provide support and incentives to facilitate the highly desired outcome that by 1997, all States and school districts will have adopted the established science standards.
- o In 1994, CEHR agencies will vigorously encourage completion of student assessment standards for mathematics and science and encourage nation-wide implementation.

- o Beginning in 1994, ED will regularly conduct mathematics and science assessments that provide state-by-state comparisons of student performance.
- o In 1994 and 1998, ED and NSF will support international assessments of student performance in science and mathematics.

Materials (Curriculum, Course, & Instructional). Federally supported model curriculum, course, and instructional materials in science and mathematics, must be developed for the effective education of all students at all grade levels. CEHR agencies must ensure that all sponsored materials: address identified needs, accurately communicate scientific principles; and, satisfy existing mathematics and emerging science standards. These materials also must be sensitive to the gender and cultural diversity of students and incorporate hands-on approaches that strengthen problem-solving skills. Special emphasis should be placed on comprehensive instructional materials at the secondary level, building on those completed for elementary and middle schools.

Milestones:

- o Beginning in 1993, CEHR agencies will ensure that all materials developed with Federal support conform to recognized science standards and to the NCTM Standards for mathematics.
- o By 1995, NSF will ensure that a comprehensive set of science and mathematics curriculum models will be available for elementary through secondary levels.

Teacher Enhancement. Immediate upgrading of the existing teacher workforce is necessary to significantly improve student performance by the year 2000. Nearly one-half of the Nation's 2.2 million teachers, especially those at the elementary level, require extensive upgrading of both disciplinary competency and pedagogical skills. Such training must respond to cultural diversity and meet accepted teaching standards, as well as familiarize teachers with curriculum standards, high-quality instructional materials, and state-of-the-art disciplinary research and educational technologies. All CEHR agencies must contribute to the achievement of this goal.

Milestone.

- o In 1993-98, 600,000 teachers (with special emphasis at the elementary level) will receive intensive disciplinary and pedagogical training through CEHR agency teacher enhancement programs. In 1993, 45,000 teachers will participate in such training (via ED, NSF, and mission agency programs); in 1994-1995, the number of teachers in such programs will increase by 50% per year; and from 1996-98, by 10% per year.

Teacher Preparation. Each year, nearly 13,000 new graduates enter mathematics and science teaching, many of whom lack essential disciplinary content and pedagogical competencies. Teacher preparation programs must conform to the new standards and should consider alternative certification procedures. Additionally, long-term strategies must overcome barriers between schools of education and disciplinary departments. An important outcome of the new strategies, initially targeted at middle-school and secondary levels, must be that of creating an effective training continuum for pre-service and in-service instruction.

Milestones.

- o In 1993 and 1994, CEHR agencies will sponsor development of model programs forging linkages between schools of education and disciplinary departments, launching a new and more effective mode of pre-service teacher instruction.
- o By 1996, at least eight geographically distributed teacher preparation consortia will be in place. By the year 2000, one-third of all new science and mathematics teachers will graduate from such programs.

-- Undergraduate --

Materials (Curriculum, Course, & Instructional). College and university studies in lower-division science, mathematics, engineering, and technology education need to be revitalized and updated in order to: (1) provide strong disciplinary and cross-disciplinary training to future science and mathematics teachers; (2) attract and retain majors in these fields, providing solid grounding in core subjects; (3) strengthen technical training (especially in two-year institutions); and, (4) advance the scientific literacy of all students. Updating lower-division curriculum is imperative given the far-reaching changes in

science and mathematics education at the secondary level.

Milestones.

- o It is highly desirable that by 1995 colleges and universities will have revitalized science, mathematics, engineering, and technology education benefitting at least one-third of students enrolled in lower-division studies. Curriculum changes will reflect disciplinary and cross-disciplinary reform. CEHR agencies will sponsor the development of curriculum models and exemplary materials and provide other incentives to facilitate the achievement of this outcome.

Faculty Development and Enhancement. Teaching faculty are central to the success of undergraduate education in science, mathematics, engineering, and technology. Therefore they must be proficient with advances in technology and instrumentation, new experimental methods, and emerging pedagogical techniques. Lower-division faculty (at both two-year and four-year institutions) warrant particular attention in order to complement curriculum reform efforts.

Milestone.

- o By 1996, CEHR agencies will expand programs and activities to provide research experiences for at least 30% of the undergraduate teaching faculty in science, mathematics, engineering, and technology.

-- Evaluation of All Federal Agency Programs --

Evaluation of CEHR Programs. Evaluation is the basis for ensuring accountability and strengthening programs. CEHR agency programs must (1) respond to identified needs; (2) represent the effective and efficient utilization of resources; and (3) maximize positive impact on the quality of science and mathematics education nationally. Under NSF leadership, CEHR will devise a coordinated strategy for member agencies to evaluate their programs. Each agency is strongly encouraged to participate in this collaborative process and build requisite knowledge and budget bases to support this activity.

Milestones.

- o In 1992, CEHR will establish an Evaluation Steering Committee with representatives from all member agencies. This standing committee will coordinate

evaluation plans across CEHR; develop procedures; and, recommend outcome indices.

- o In 1993, NSF will support the establishment of an external expert panel to inform CEHR agencies of evaluation needs and to make broad assessments of the merit of member agencies' programs.
- o In 1993, the Evaluation Steering Committee will design an assessment study of the capacity and accessibility of Federal laboratories for teacher enhancement programs; this study will be completed in 1994.
- o In 1994, each CEHR agency will complete plans for evaluating its major mathematics and science education programs, giving special consideration to priorities of mission agencies as well as to CEHR's agenda.
- o In 1996, each agency will complete evaluation of its highest priority programs and disseminate results to CEHR agencies.

Tier II Priorities: Expanding Participation and Access

Restructure Programs to Increase Participation of Underrepresented Groups in Science, Mathematics, Engineering, and Technology. To ensure availability of a highly trained scientific and technical workforce, the Nation must not continue to condone underrepresentation of any group in science, mathematics, engineering, and technology education. Women, underrepresented minorities, and the disabled must be more fully represented in our education programs and ultimately in our science workforce.

Despite sustained Federal investment and the emergence of targeted programs over the past several decades, little forward progress has been achieved at any education level. Yet we have a clear understanding of underlying issues and possess examples of programs that work. A new, comprehensive, and integrated Federal management strategy is needed that will marshal innovative and successful approaches to effect increased participation of all groups across the entire education continuum.

Milestones.

- o In 1993, CEHR will define a set of goals that challenge Federal programs to increase participation of underrepresented groups in the scientific and technical workforce.

- o In 1993, CEHR will develop realistic and widely applicable measures to identify successful programs and exemplary products that will contribute to increasing the participation of underrepresented in science, mathematic, engineering, and technology..
- o In 1994, CEHR will inventory its programs against these measures, identifying those suitable for replication.
- o In 1995, CEHR will develop a coordinated strategy, covering the education continuum and capitalizing on the different strengths of agencies. The strategy will include mechanisms to replicate successful programs, introduce new, innovative programs that meet the same criteria, and disseminate exemplary education products.

Dissemination At All Education Levels. The high-quality instructional materials and exemplary model programs developed under Federal support must reach administrators, faculty, teachers, and students. Thus steps will be taken to identify exemplary program strategies and materials for dissemination. Effective dissemination, however, does not ensure utilization. Outreach and technical assistance activities must be developed that promote adoption and implementation in the field. Agencies must also capitalize on the potential for synergy among activities, for example, utilizing teacher training and materials development programs.

CEHR strongly endorses a coordinated materials dissemination effort that fully integrates existing mechanisms. CEHR opposes proliferation of disparate actions that dilute effectiveness of current planned efforts.

Milestones.

- o In 1993, CEHR will develop a set of quality standards and each agency will put in place mechanisms for evaluating their instructional materials.
- o By 1995, each CEHR agency will begin evaluation of their products to ensure quality standards are met. Subsequently, broad-based dissemination will occur through a range of mechanisms including Federal clearinghouses, electronic networks, and commercial vendors.

Identify Federal Strategies to Employ Educational Technologies More Broadly. Emerging technologies show great promise for optimizing student learning. CEHR views the Federal role in

educational technology as supporting research and development, implementation, and infrastructure development.

Milestones.

- o In 1993, CEHR agencies will inventory technology-based activities (i.e., computational science and mathematics tools, learning environments, teaching aids and tutoring systems, and networking and distance learning). Agencies will identify activities (Federal and private) that show the most potential for improving the delivery of science, mathematics, engineering, and technology education; develop resident expertise to understand better the role technologies can play in their education-related activities; and share information through a continuing interagency working group.
- o In 1995, CEHR agencies will support an expanded array of educational technology activities demonstrating significant potential.

Tier III Priorities: Enabling Activities

Public Science Literacy. To remain competitive in world markets, the United States must have a scientifically literate public capable of understanding complex political, ethical, and social issues deriving from an increasingly technological society. A scientifically literate citizenry is also needed to advocate continued support for a healthy research enterprise, and to encourage and motivate youth to study mathematics and science. Without this encouragement, the science education efforts of the Federal government will be ineffective.

Milestones.

- o In 1994, CEHR, under the leadership of HHS, will host a consensus development conference to consider standards for public science literacy, identify data needs, and propose effective education strategies with a special emphasis on reaching underserved populations.
- o In 1995, the CEHR will adopt science literacy standards, based on the consensus development conference recommendations.
- o In 1996, CEHR agencies will revise and strengthen their public science literacy programs to satisfy the science

- o By 1998, it is highly desirable that the proportion of U.S. adults who are scientifically literate will double.

Promote Formation & Strengthening of Partnerships Between Two-Year Institutions and Other Sectors. Two-year colleges are an important link in the education pipeline for scientists, engineers, and precollege science and mathematics educators. Moreover, they have primary responsibility for the training of technicians and increasing the scientific literacy of their students, regardless of major. Agencies need to be sensitive to the needs of these institutions. Federal programs should stimulate stronger linkages between two-year colleges and both the precollege and upper-division undergraduate sectors in order to facilitate student enrollment, program articulation, and improved instruction.

Milestone.

- o By 1995, CEHR agencies will expand activities that promote linkages between two- and four-year institutions as well as with high schools.

CONCLUSION

This Interim Strategic Plan is submitted to the CEHR agencies primarily for the purpose of guidance in preparing the President's FY 1994 budget. The Working Subgroup draft reports have been submitted to the Strategic Plan Working Group for consideration and are appended to provide additional background information. The final Strategic Plan, which will be submitted to CEHR on September 8, 1992, will include a revised version of this interim plan and additional sections on new authorities, resources required to implement the Plan, and management and implementation issues.

Interim FY 1994 Federal Priority Framework *

Base Program

- Maintain & Capitalize on Current World-Class Programs (e.g., Graduate Education)
- Expand Opportunities for Underrepresented Groups (e.g., Women, Minorities, Disabled)

Tier I Priorities: Formal System Change

-- Elementary & Secondary: System Reform --

- Curriculum, Teaching, and Assessment Standards: Development & Implementation
- State Curriculum Frameworks: Development & Implementation
- Curriculum, Course, & Instructional Materials: Development & Implementation
- Teacher Enhancement & Preparation

-- Undergraduate: Revitalization --

- Curriculum, Course, & Instructional Materials: Development & Implementation (Lower-Division)
- Undergraduate Faculty Enhancement
- Evaluation of Federal Agency Programs: All Education Levels

Tier II Priorities: Expanding Participation & Access

- Increase Participation of Groups Underrepresented in Science, Mathematics, Engineering, and Technology: All Education Levels
- Identify, Disseminate, & Promote Adoption of Exemplary Program Strategies & Materials: All Education Levels
- Identify Federal Strategies to Employ Educational Technologies More Broadly

Tier III Priorities: Enabling Activities

- Public Science Literacy
- Promote Formation & Strengthening of Partnerships Between Two-Year Institutions and Other Sectors

* Program areas with designated agency leadership are: Science Curriculum Standards Development (ED); Teaching & Assessment Standards Development (NSF). Program areas with designated agency coordination responsibilities are: Program for Teacher Enhancement @ Federal Laboratories (DOE); Evaluation (NSF); and Public Science Literacy (HHS). Agencies are strongly encouraged to lend their expertise and resources to program areas that support this Strategic Plan and that are consistent with their missions.



DEPARTMENT OF ENERGY
Washington, DC 20585

June 1, 1992

OFFICE OF THE SECRETARY

MEMORANDUM FOR: FCCSET CEHR Members
FCCSET CEHR Working Group Members

FROM: *for* Peggy Dufour *C. James*
Executive Secretary, FCCSET CEHR

SUBJECT: Next Meeting of the FCCSET Committee on Education and Human Resources

The next meeting of the FCCSET Committee on Education and Human Resources has been scheduled for June 9, 1992, from 2:00 p.m. to 3:00 p.m. in Room 8E-089 here at the Department of Energy, 1000 Independence Avenue, S.W.

The Committee will be meeting to discuss the interim strategic plan that will be sent to agencies as budget guidance for their FY 1994 planning. You should receive a copy of this draft plan from the Strategic Plan Working Group by the afternoon of June 4, 1992.

DOE F 1326.7

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(Exception to SF 14, Approved by NARS, June 1978)

EPG(08-90)

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Washington, D.C.

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(Signature of authorizing official) Cheryl King
P.M.

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U.S. DEPARTMENT OF EDUCATION
NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C.



APR 10 1992

TO: Committee on Education and Human Resources (CEHR) Strategic Plan
Subgroup Members

FROM: Vice-Chairmen, FCCSET CEHR

SUBJECT: Guidance on Strategic Plan Development

The FCCSET Committee on Education and Human Resources (CEHR) strategic planning process has been launched with the participation of over 75 representatives from 15 agencies. This group has the talent necessary to tackle this ambitious and important task.

As described at the last CEHR meeting, the objective of the strategic planning exercise is to move the FCCSET CEHR process ahead a critical step. Over the last two years, we have clearly demonstrated that all agencies play critical and complementary roles in the areas of mathematics and science education. The CEHR strategic objectives, consistent with the National Education Goals and the Administration's AMERICA 2000 strategy, provide important guidance for the development of these programs in all member agencies. This year, however, our objective is to combine these activities, creating an integrated Federal strategy that is clearly greater than the sum of its parts.

As a participant in this strategic planning process, each of you is asked to serve in two important capacities: first, as an education expert providing substantive input for the design of a five-year, multi-agency strategy that establishes Federal sector goals and specific milestones to measure our achievement; and, second, as an agency official bringing a knowledge of your programs and an ability to define their role within the strategy. Both of these roles are critical to our success. To develop a truly effective Federal program, you need to be prepared to coordinate with others to meet common objectives; to eliminate duplication of effort; to fill identified gaps; and to look for opportunities to revitalize and strengthen existing activities.

We look forward to working with you during the next few months and thank you for participating in this important endeavor.

David T. Kearns
Vice-Chairman, CEHR

Luther S. Williams
Vice-Chairman, CEHR

cc:

Admiral Watkins

Ms. Dufour

Dr. Goldberg

Ms. Phillips

CEHR Members:

H. Mussman, DoA

N. Mason, DoC

C. Jehn, DoD

F. Goodwin, HHS

J. Sommer, HUD

J. Samuels, DoJ

R. Jones, DoL

J. Schrote, DoI

K. Moore, DoT

J. Holsinger, DoVA

E. Bretthauer, EPA

S. Armstrong, NASA

J. Hezir, OMB

B. White, OMB

C. Kolb, OPD

T. Ratchford, OSTP

A. Bay, SI

FCCSET



UNITED STATES DEPARTMENT OF EDUCATION

May 4, 1992

THE DEPUTY SECRETARY

MEMORANDUM

TO : FCCSET-CEHR Members

FROM : David Kearns, Vice-Chairman, FCCSET-CEHR *D. Kearns*

SUBJECT: Establishment of CEHR Budget Working Group

FCCSET-CEHR is about to begin the second major endeavor of 1992: the development of the FY 1994 interagency budget for mathematics and science education. The Strategic Plan Working Group has been established and is making progress toward the development of a strategic plan that will guide the Federal government in its quest to make America first in the world in mathematics and science by the year 2000. I would like to thank you and your staff for the significant effort you have put into developing this plan. An interim strategic plan will be produced by June 8 and sent to the heads of participating agencies and departments for their use in developing the FY 1994 Budget.

The second charge for the FCCSET-CEHR for 1992 is the development of an integrated FY 1994 interagency budget. This budget will be the first step in implementing the strategic plan. It will contain options at various funding levels accompanied by a thorough analysis that addresses the impact of each option and its effects on the milestones in the Strategic Plan.

To accomplish this important task, I am establishing the CEHR Budget Working Group. I have appointed Thomas M. Corwin, Director of the Division of Elementary, Secondary, and Vocational Analysis in the Budget Service of the Department of Education, to serve as the Chairman of the CEHR-BWG. I am requesting that you nominate at least one representative from your agency to serve on this working group. Representatives should be familiar with your agency's budget process and be able to serve as a direct liaison with your agency's budget office. Please submit your nominations by May 8, 1992, to Thomas Corwin or Julie Edmunds of his staff at 202-401-0318.

I appreciate the amount of work you and your agencies have put into this endeavor. I believe that a solid budget presentation supporting an imaginative and thorough Strategic Plan will be a crucial step as we move forward to meet the National Education Goals.

400 MARYLAND AVE., S.W. WASHINGTON, D.C. 20202-0500

FACSIMILE COVER SHEET



NASA HEADQUARTERS
OFFICE OF THE ADMINISTRATOR

(Use of the NASA Seal authorized for the Administrator's Office Only)

TO: FCCSET CEHR Members

DATE: May 4, 1992

FROM: Angela M. Phillips
Telephone: 202/453-4451

Number of Pages
Including Cover Sheet: 2

FCCSET CEHR Members

Admiral James D. Watkins, USN (Ret)
David Kearns
Dr. Luther Williams
Dr. Harry C. Mussman
Marc G. Stanley
Christopher Jehn
Dr. Frederick K. Goodwin
John W. Sommer
John E. Schrote
Julie Samuels
Roberts Jones
Kate L. Moore
Dr. James W. Holsinger
Erich W. Bretthauer
Lt. Gen. Spence M. Armstrong, USAF (Ret)
Ann I. Bay
Dr. J. Thomas Ratchford
Joseph S. Hezir
Charles E. M. Kolb

Distributed this date per Mr. David Kearns' request.

FCCSET

FACSIMILE COVER SHEET



NASA HEADQUARTERS
OFFICE OF THE ADMINISTRATOR

(Use of the NASA Seal authorized for the Administrator's Office Only)

June 9, 1992

DATE: _____

TO: CEHR Members

FROM: NASA/Angela M. Phillips

A handwritten signature in dark ink, appearing to read "Angela M. Phillips", is written over the "FROM:" line.

SUBJECT: CEHR Interim Strategic Plan

Enclosed is the CEHR Interim Strategic Plan which was submitted to the Chair and Vice-chairs on June 8, 1992. This plan will be the topic of discussion at this afternoon's CEHR meeting.

Originals with supporting documentation are being hand-delivered to your office this morning. If this material is not delivered by 11:00 a.m. this morning, please contact my office immediately.

Enclosure

MEMORANDUM

UNITED STATES DEPARTMENT OF EDUCATION
OFFICE OF THE ASSISTANT SECRETARY
FOR EDUCATIONAL RESEARCH AND IMPROVEMENT

JUN 8 1992

TO: David Kearns Luther Williams
Vice-Chairs
Committee on Education and Human Resources

FROM: Milton Goldberg *Conceded & signed for*
Chairman
Strategic Plan Working Group

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Engineering and Technology
Committee on Education and Human Resources (CEHR)**

**Interim Strategic Plan
FY 1994 - FY 1998**

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- o Beginning in 1994, ED will regularly conduct mathematics and science assessments that provide state-by-state comparisons of student performance.
- o In 1994 and 1998, ED and NSF will support international assessments of student performance in science and mathematics.

Materials (Curriculum, Course, & Instructional). Federally supported model curriculum, course, and instructional materials in science and mathematics, must be developed for the effective education of all students at all grade levels. CEHR agencies must ensure that all sponsored materials: address identified needs, accurately communicate scientific principles; and, satisfy existing mathematics and emerging science standards. These materials also must be sensitive to the gender and cultural diversity of students and incorporate hands-on approaches that strengthen problem-solving skills. Special emphasis should be placed on comprehensive instructional materials at the secondary level, building on those completed for elementary and middle schools.

Milestones:

- o Beginning in 1993, CEHR agencies will ensure that all materials developed with Federal support conform to recognized science standards and to the NCTM Standards for mathematics.
- o By 1995, NSF will ensure that a comprehensive set of science and mathematics curriculum models will be available for elementary through secondary levels.

Teacher Enhancement. Immediate upgrading of the existing teacher workforce is necessary to significantly improve student performance by the year 2000. Nearly one-half of the Nation's 2.2 million teachers, especially those at the elementary level, require extensive upgrading of both disciplinary competency and pedagogical skills. Such training must respond to cultural diversity and meet accepted teaching standards, as well as familiarize teachers with curriculum standards, high-quality instructional materials, and state-of-the-art disciplinary research and educational technologies. All CEHR agencies must contribute to the achievement of this goal.

Milestone.

- o In 1993-98, 600,000 teachers (with special emphasis at the elementary level) will receive intensive disciplinary and pedagogical training through CEHR agency teacher enhancement programs. In 1993, 45,000 teachers will participate in such training (via ED, NSF, and mission agency programs); in 1994-1995, the number of teachers in such programs will increase by 50% per year; and from 1996-98, by 10% per year.

Teacher Preparation. Each year, nearly 13,000 new graduates enter mathematics and science teaching, many of whom lack essential disciplinary content and pedagogical competencies. Teacher preparation programs must conform to the new standards and should consider alternative certification procedures. Additionally, long-term strategies must overcome barriers between schools of education and disciplinary departments. An important outcome of the new strategies, initially targeted at middle-school and secondary levels, must be that of creating an effective training continuum for pre-service and in-service instruction.

Milestones.

- o In 1993 and 1994, CEHR agencies will sponsor development of model programs forging linkages between schools of education and disciplinary departments, launching a new and more effective mode of pre-service teacher instruction.
- o By 1996, at least eight geographically distributed teacher preparation consortia will be in place. By the year 2000, one-third of all new science and mathematics teachers will graduate from such programs.

-- Undergraduate --

Materials (Curriculum, Course, & Instructional). College and university studies in lower-division science, mathematics, engineering, and technology education need to be revitalized and updated in order to: (1) provide strong disciplinary and cross-disciplinary training to future science and mathematics teachers; (2) attract and retain majors in these fields, providing solid grounding in core subjects; (3) strengthen technical training (especially in two-year institutions); and, (4) advance the scientific literacy of all students. Updating lower-division curriculum is imperative given the far-reaching changes in

science and mathematics education at the secondary level.

Milestones.

- o It is highly desirable that by 1995 colleges and universities will have revitalized science, mathematics, engineering, and technology education benefitting at least one-third of students enrolled in lower-division studies. Curriculum changes will reflect disciplinary and cross-disciplinary reform. CEHR agencies will sponsor the development of curriculum models and exemplary materials and provide other incentives to facilitate the achievement of this outcome.

Faculty Development and Enhancement. Teaching faculty are central to the success of undergraduate education in science, mathematics, engineering, and technology. Therefore they must be proficient with advances in technology and instrumentation, new experimental methods, and emerging pedagogical techniques. Lower-division faculty (at both two-year and four-year institutions) warrant particular attention in order to complement curriculum reform efforts.

Milestones.

- o By 1996, CEHR agencies will expand programs and activities to provide research experiences for at least 30% of the undergraduate teaching faculty in science, mathematics, engineering, and technology.

-- Evaluation of All Federal Agency Programs --

Evaluation of CEHR Programs. Evaluation is the basis for ensuring accountability and strengthening programs. CEHR agency programs must (1) respond to identified needs; (2) represent the effective and efficient utilization of resources; and (3) maximize positive impact on the quality of science and mathematics education nationally. Under NSF leadership, CEHR will devise a coordinated strategy for member agencies to evaluate their programs. Each agency is strongly encouraged to participate in this collaborative process and build requisite knowledge and budget bases to support this activity.

Milestones.

- o In 1992, CEHR will establish an Evaluation Steering Committee with representatives from all member agencies. This standing committee will coordinate

evaluation plans across CEHR; develop procedures; and, recommend outcome indices.

- o In 1993, NSF will support the establishment of an external expert panel to inform CEHR agencies of evaluation needs and to make broad assessments of the merit of member agencies' programs.
- o In 1993, the Evaluation Steering Committee will design an assessment study of the capacity and accessibility of Federal laboratories for teacher enhancement programs; this study will be completed in 1994.
- o In 1994, each CEHR agency will complete plans for evaluating its major mathematics and science education programs, giving special consideration to priorities of mission agencies as well as to CEHR's agenda.
- o In 1996, each agency will complete evaluation of its highest priority programs and disseminate results to CEHR agencies.

Tier II Priorities: Expanding Participation and Access

Restructure Programs to Increase Participation of Underrepresented Groups in Science, Mathematics, Engineering, and Technology. To ensure availability of a highly trained scientific and technical workforce, the Nation must not continue to condone underrepresentation of any group in science, mathematics, engineering, and technology education. Women, underrepresented minorities, and the disabled must be more fully represented in our education programs and ultimately in our science workforce.

Despite sustained Federal investment and the emergence of targeted programs over the past several decades, little forward progress has been achieved at any education level. Yet we have a clear understanding of underlying issues and possess examples of programs that work. A new, comprehensive, and integrated Federal management strategy is needed that will marshal innovative and successful approaches to effect increased participation of all groups across the entire education continuum.

Milestones.

- o In 1993, CEHR will define a set of goals that challenge Federal programs to increase participation of underrepresented groups in the scientific and technical workforce.

- o In 1993, CEHR will develop realistic and widely applicable measures to identify successful programs and exemplary products that will contribute to increasing the participation of underrepresented in science, mathematic, engineering, and technology..
- o In 1994, CEHR will inventory its programs against these measures, identifying those suitable for replication.
- o In 1995, CEHR will develop a coordinated strategy, covering the education continuum and capitalizing on the different strengths of agencies. The strategy will include mechanisms to replicate successful programs, introduce new, innovative programs that meet the same criteria, and disseminate exemplary education products.

Dissemination At All Education Levels. The high-quality instructional materials and exemplary model programs developed under Federal support must reach administrators, faculty, teachers, and students. Thus steps will be taken to identify exemplary program strategies and materials for dissemination. Effective dissemination, however, does not ensure utilization. Outreach and technical assistance activities must be developed that promote adoption and implementation in the field. Agencies must also capitalize on the potential for synergy among activities, for example, utilizing teacher training and materials development programs.

CEHR strongly endorses a coordinated materials dissemination effort that fully integrates existing mechanisms. CEHR opposes proliferation of disparate actions that dilute effectiveness of current planned efforts.

Milestones.

- o In 1993, CEHR will develop a set of quality standards and each agency will put in place mechanisms for evaluating their instructional materials.
- o By 1995, each CEHR agency will begin evaluation of their products to ensure quality standards are met. Subsequently, broad-based dissemination will occur through a range of mechanisms including Federal clearinghouses, electronic networks, and commercial vendors.

Identify Federal Strategies to Employ Educational Technologies More Broadly. Emerging technologies show great promise for optimizing student learning. CEHR views the Federal role in



UNITED STATES
DEPARTMENT OF EDUCATION

NATIONAL SCIENCE
FOUNDATION



MAR 10 1992

TO: FCCSET Committee on Education and Human Resources (CEHR) Members

FROM: Vice-Chairmen, FCCSET CEHR

SUBJECT: CEHR Meeting Notice, March 19, 1992

The Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) Committee on Education and Human Resources (CEHR) will meet on Thursday, March 19, 1992, 3:30 p.m. - 5:00 p.m., NASA Headquarters, 400 Maryland Avenue, SW, Room 7002, Washington, DC 20546. A copy of the meeting agenda is enclosed.

The FCCSET CEHR has proven to be an effective and productive endeavor of the federal government in the area of mathematics and science education. As we enter the third year of the CEHR, it is fitting for us to acknowledge the evolution and maturation of this endeavor. In the first year, CEHR assembled a comprehensive inventory of all federal government mathematics and science education programs. This was a very necessary and beneficial starting point, one that allowed all participants to learn about the various programs and to proceed into year two with a common baseline. The second year of CEHR reflected a transition from an inventory initiative to one of developing an initial bona fide agency crosscut.

It is our intention that this year will also reflect a clear transition from the previous two years. The principal focus of the CEHR will be to initiate a strategic examination of the current U.S. mathematics and science educational activities and to outline a CEHR Strategic Plan for the future. The CEHR Strategic Plan will be the basis for the preparation of the FY 1994 CEHR budget crosscut. Given this priority, all CEHR activities will be conducted in a supporting role to the development of the CEHR Strategic Plan. It is essential that all CEHR member agencies participate fully in this important initiative.

We look forward to our meeting on March 19, 1992. Should you require any additional information, please contact Ms. Angela M. Phillips, Executive Secretary, FCCSET CEHR at 202/453-4451.

David T. Kearns
Vice Chairman, CEHR

Luther S. Williams
Vice-Chairman, CEHR

Enclosure

cc:
Richard H. Truly (NASA)
Angela M. Phillips (NASA)

MAR 11 1992 7:53 FROM NASA HQ