US makes 'boldest effort in years' to boost school science teaching

Washington. Nine cities were this week chosen by the National Science Foundation (NSF) to spearhead a bold attempt to overhaul the entire school science education system in the United States.

The so-called Urban Systemic Initiative (USI) is intended to address a situation which, American universities contend, leaves a typical 18-year-old high-school graduate 18 months behind his or her counterpart in Europe or Japan.

New York city — one of the chosen nine and the largest school district in the country — has also announced sweeping changes to the way science is taught in schools. These will eliminate general science courses, and will require students to pass advanced courses in mathematics and science before they can graduate.

The amount of new money involved in USI is not large, amounting to $15 million over five years for each city. But the cooperative agreement that NSF will reach with recipient's will cover the spending of far larger amounts of the cities' resources.

"[NSF's contribution] is designed as a catalyst to enable the cities to put in place a new infrastructure for math and science education," says Luther Williams, assistant director for education at the NSF. He says the expenditure leveraged in this way will be 20 or more times the NSF's contribution.

USI is aimed at cities with many children in poverty. But with almost half of American children at school in urban areas, the initiative is also intended to improve overall standards.

The first USI agreements, due to be announced on 10 May, are with Baltimore, Chicago, Cincinnati, Miami, Dallas, Detroit, El Paso, New York and Phoenix. A further 16 eligible cities may join the scheme at a later date.

The initiative will trigger different action plans in each city, with the money going on a mixture of new curriculum development, teacher retraining in collaboration with local universities, school restructuring and other, sometimes experimental, reforms; Cincinnati, for example, will try out a year-round programme in pilot schools.

In New York, the schools chancellor, Ramon Cortines, announced last week that students will no longer have the option of taking non-academic mathematics and science courses to graduate. "The easy way out is the road to nowhere," Cortines pronounced, although a spokesman for the city's board of education was vague about where the extra resources would come from.

Jerrold Ross, of the school of education at New York University, says he welcomes any attempt to raise standards, but that questions remain. "Are the teachers prepared to teach at this level?" he asks, pointing out that the city dropped its entrance requirements for teachers to get more of them into the classroom. "It's refreshing that someone is trying; but more money's going to have to come from some place."

In New York, the NSF's $2-million contribution for the first year of USI represents $2 for each child at school. But more money will come from the city, which has pledged to reform middle-school education to help students to cope with harder courses.

Although it is primarily a research funding agency, the NSF has been increasingly sucked into school education. Each year Congress — more concerned about the state of city schools than with funding scientists to write academic papers — diverts more of its money into programmes such as USI.

The NSF is already managing a large if diffuse Statewide Systemic Initiative (SSI) in 25 states and preparing a smaller Rural Systemic Initiative to help poor rural areas. It has already kicked one state — Rhode Island — off the SSI for failing to meet agreed benchmarks.

The initiatives also tie in with the Goals 2000 Educate America Act, which was passed by Congress in March and mandates the Department of Education to undertake similar programmes in non-science subjects.

But the federal government faces big problems in attempting to upgrade a schools system that is managed and financed at the local, county level, and where the money spent per student per year ranges from $2,000 in parts of rural Mississippi to $8,000 in Beverly Hills, California.

Shirley Malcom, director of education at the American Association for the Advancement of Science, and a member of the National Science Board which approved the USI grants, says the scale of the new initiatives makes them different: "We haven't tried to revamp the entire system before," she says.

But teachers' groups are sceptical. Bill Aldridge, director of the National Science Teachers' Association, says USI is well-focused, but many federal programmes lack substance. "They focus on administrative and structural changes, and completely neglect the fundamental problem, the lack of appropriate materials and poor preparation of teachers."

Aldridge is not sanguine about the prospects for reform. The New York plan reminds him of a Florida scheme some years back, which promised three years of science for every child. But without extra teachers and equipment, the scheme failed.

Colin Macilwain

This rearing, roaring cave bear (right) is just one of 250 specimens that will greet visitors to the Lila Acheson Wallace Wing of Mammals and their Extinct Relatives, which opens at the American Museum of Natural History (AMNH), New York, on 14 May. The opening coincides with the AMNH's 125th anniversary, and the refurbished gallery is the first of several that will reopen in a programme that extends through 1995 (dinosaurs) and 1996 (primitive vertebrates).

'Mammals' guides visitors through mammalian history using a cladistic rather than a chronological approach, in line with the museum's strong research commitment to fossil mammals. This accent on systematics is likely to cause a stir; when the Natural History Museum (NHM) in London tried the same trick a decade ago, researchers were outraged and visitors baffled by the result.

But any system is better than none at all. The NHM scrapped its own fossil mammal gallery (along with most of its research on fossil mammals) in favour of ecology, and the present hall — 'Discovering Mammals' — is best regarded as a stopgap. In contrast, the NHM's new dinosaur hall, with its accent on biology rather than systematics, is an enormous success. Henry Gee