

2008 SUMMER INSTITUTES FOR TEACHERS IN MATHEMATICS AND SCIENCE: CORNELL PHYSICAL SCIENCES SUMMER INSTITUTE FOR MIDDLE SCHOOL TEACHERS

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This proposal requests support for a rigorous one-week physical science summer institute that has been designed specifically for intermediate (grades 5-8) science teachers from New York City. The institute will be offered as a summer course through Cornell University worth one graduate credit in physics. The goal of the institute is to increase the teachers' physical science content knowledge. The course will promote the interaction of teachers with scientists to foster a greater understanding of the scientific process through the exposure to real-world research. Presentations and discussions will cover topics appropriate to the curriculum and will emphasize technological advancements and applications. Topics covered during the course will include properties of matter, properties of light and sound, energy, the conservation of energy, simple and complex machines, science process skills, scientific inquiry and the nature of science. This course will model hands-on classroom activities designed to increase student learning, encourage the use of instructional technologies in the classroom, and will integrate inquiry-based pedagogical techniques.

New York City has adopted an integrated spiral approach that introduces students to demanding science subjects gradually. Since the physical science is taught each year throughout middle school in New York City, the topics covered in the Institute will be useful to all grade-level teachers. As instructors, we will focus on specific concepts taught at each of the four grade levels, as well as many universal standards-based concepts. Teachers will be engaged in hands-on lessons using standards-based instructional materials that can be used with their students. By doing the activities themselves and learning about how the concepts are applied in cutting edge research with state-of-the-art technology, teachers will increase content knowledge and the confidence to teach in a way that will maximize their students' understanding of the concepts.