

Overview of Informal Science Education

Excerpts from the National Science Foundation

Program Solicitation #NSF0160

GOALS AND OBJECTIVES

Informal Science Education (ISE) supports projects designed to increase public understanding of science, mathematics, and technology. All ISE projects have as their primary audience the informal learner. Informal learning is the lifelong process in which every person acquires knowledge, skills, attitudes, and values from daily experiences and resources in his or her environment.

Informal learning, in contrast with formal learning, occurs outside formal classroom settings and is not part of a school program, activity, or assignment. Informal learning is voluntary, self-directed, lifelong, and motivated mainly by intrinsic interests, curiosity, exploration, fantasy, task completion, and social interaction. Informal learning can be linear or non-linear and often is self-paced and visual- or object-oriented. It provides an experiential base and motivation for further activity and learning. The outcomes of an informal learning experience in science, mathematics, and technology (SMT) include a better understanding of concepts, topics, processes, and thinking in scientific and technical disciplines, as well as increased knowledge about career opportunities in those fields. While ISE projects are aimed primarily at the informal learner, the ISE program encourages linkages to formal education.

The goals of the ISE program are to produce significant positive changes that:

- increase the number of youth, particularly from underrepresented groups (e.g., minorities, women and girls, persons with disabilities) who are excited about SMT and who pursue SMT activities both in- and out-of-school;
- promote linkages between informal and formal education, creating a synergy that strengthens SMT education in many learning environments;
- stimulate parents and other adults to become effective proponents for higher quality and universally available SMT education in both informal and formal settings;
- encourage parents and other primary caregivers to support their children's SMT endeavors in the home and elsewhere;
- bring informal science education programs and activities to areas that are currently without, or minimally reached by, SMT opportunities (e.g., rural and inner city environments);
- improve the scientific and technological literacy of children and adults so that they are informed about the implications of SMT in their everyday lives, are motivated to pursue further experiences in these areas, and are aided in making informed, responsible decisions about SMT policies that have societal implications; and
- strengthen SMT education, as well as the ISE program and its supported activities, through applied research about informal learning.

The ISE program especially encourages projects that provide creative and innovative informal learning activities that reflect and apply recent research in SMT education. Projects should contribute to strengthening the infrastructure of informal science education through activities such as electronic networking, technical assistance, and professional development of informal science educators.

Projects should conduct research on the informal education process to determine the effectiveness of innovative techniques for motivating interest in, and informing the public about, SMT topics.

PROJECT CHARACTERISTICS

ISE projects provide rich and stimulating opportunities that primarily are not part of formal school programs, activities, or assignments. Through such opportunities individuals of all ages, interests, and backgrounds may increase their appreciation, understanding and use of science, mathematics, and technology. When appropriate, projects are expected to align with national science, mathematics, and technology standards to guide project content and to promote linkages with formal education. Projects include, but are not limited, to: television series and programs for youth or for the general public; films on SMT topics; exhibits or educational programs at science and natural history museums, science-technology centers, aquaria, nature centers, botanical gardens, arboreta, zoological parks, and libraries; and educational programs and activities through community/youth-based programs.

Most ISE projects are designed to reach large audiences and to have a significant regional or national impact. ISE does not support local projects that reach relatively few people, nor does it support general operating expenses or capital development costs for informal science institutions. The program does, however, encourage development of projects that address critical needs for informal science education in less populated regions of the country. All projects are expected to disseminate effective designs or materials in order to maximize their impact. All ISE projects should include plans for rigorous evaluation, based on comprehensive quantitative and qualitative information, in order to document project impact and demonstrate potential for dissemination and replication.

AREAS OF SPECIAL EMPHASIS

ISE encourages the field to strengthen its many current positive approaches to informal education for the American public. The field is challenged also to expand the scope of informal science education activities in order to have greater impact in areas of particular need. Specifically, ISE expects informal science education institutions to become significant players in the total science and mathematics education of our nation's youth. To accomplish this, they must establish new relationships with major scientific research efforts that enable them to inform the public of the latest scientific advances; explore new ways to engage the public in SMT activities; and inform the public about the need for high-quality, standards-based SMT education. ISE will place special emphasis in the following areas:

Collaborations That Link Informal and Formal Education Communities. Through effective combination of diverse resources and expertise, collaborations can promote creativity and significantly broaden project impact. ISE encourages development of collaborative projects that bring together individuals and organizations from the formal and informal education communities. Where informal science education institutions establish, or have in place long-term, formal agreements with schools in their service area, ISE will support the informal education aspects of those endeavors. For instance, ISE will support development and piloting of materials and educational programs that are complementary to ones in formal education and that are aligned with the curricula and teacher professional development needs of schools. Such materials and programs also must be designed and used to inform the general public, parents, and other caregivers about science, mathematics, and technology, as well as about curricula and educational reform in the schools.

Funds for the on-going implementation, operation, and delivery of such services to schools must be provided by the school, the informal education institution, or other sources.

Increasing Opportunities for Under-represented Groups. Informal science education plays an important role in motivating the interest and participation of groups traditionally underrepresented in SMT and in increasing their access to quality materials. ISE encourages development of projects across a variety of agencies (e.g., community-based organizations, museums, media) for development and implementation of new and innovative strategies that demonstrate promise of increasing participation of minorities, girls and women, persons with disabilities, and youth and adults from economically disadvantaged areas (e.g., inner cities, rural communities) in SMT disciplines.

Increasing Involvement of Parents in SMT. Parents and other primary caregivers may be effective proponents for science and mathematics education reform. Further, they may play a critical role in promoting success through encouragement and involvement in their children's SMT activities at home, in school, and in informal education settings. ISE encourages development of projects that improve parent understanding of, and attitudes toward, science, mathematics, and technology, as well as ones that increase awareness of new approaches in teaching and assessment. Materials for parents/caregivers should provide effective ways to support children's work in science and mathematics and actively involve them as partners in inquiry-based, experiential activities.

Informing the Public about Research. ISE supports projects that link with major national and international science research efforts in order to inform the public about the purposes, progress, findings, and implications of cutting edge research. Proposed projects should be designed to reach significant segments of the American public. Because of the on-going nature of research, projects should be designed to be updated periodically in order to incorporate new findings or to report progress in the research endeavor.

Increasing Public Understanding of Mathematics. ISE is interested in coordinated, wide-reaching informal education efforts that promote key elements of the national standards in mathematics. For instance, a relatively small public exhibit might explain one or more important areas and engage the public in mathematical activities. If the exhibit were easily replicated, it could be implemented simultaneously at sites across the nation and be promoted by a coordinated national and local campaign as a cost-effective means of informing parents and the public about mathematics education reform.

Innovative High Risk Projects. Innovative and creative informal education projects that develop innovative approaches to delivering informal SMT education and/or delve into emerging SMT content areas have the potential to open new opportunities in the informal science education field. Such projects should test their approaches and document their effectiveness toward reaching SMT learning goals. These projects must incorporate applied research studies and strong evaluation plans. There also should be specific dissemination activities to inform the informal science education field about findings.

Source: <http://www.nsf.gov/pubs/2001/nsf0160/nsf0160.txt>