

# **Science Adventures**

School Year 2006-07 Report

## **Background**

Science Adventures are enriching supplements provided by the Society for Excellence through Education to all Excellence 2000 (E2K) classes across Israel. E2K teachers may select three external activities or “adventures” per year for their class. Some are special activities that “arrive” at the school; others are activities outside the school. These adventures expose the students to fascinating aspects of the scientific world through trips to research institutions or science and technology centers across Israel. They provide unique experiences that go beyond the schoolroom curriculum, in many cases giving the youngsters their first opportunity to see how classroom learning is applied to every-day life.

Other adventures bring mobile science units to their school to demonstrate and explain fascinating scientific phenomena. These units are sponsored and staffed by a variety of well-known academic and research institutions that promote interest in the sciences.

The enrichment activities also serve another purpose – they act as a “booster shot” or a “reward” for the diligent effort the students have invested in their E2K classes.

## **Rationale**

Today, Israel is one of the leading countries in the world in scientific and technological research. To continue excelling in these rapidly changing fields, the education system must produce adequate numbers of young people with strong scientific literacy, curiosity and drive. E2K's Science Adventures aim to stimulate these types of young people by introducing them to cutting-edge science and technological advances in an experiential and fascinating environment.

## **Target population**

Science Adventures are made available to outstanding students who participate in Excellence 2000 classes in their respective schools. In the past school year 8,000 students in 160 schools were enrolled in the Excellence 2000 program. They came from every segment of Israeli society – including secular and religious Jews, native born and immigrant young people, Arabs and Druze. Bright and motivated youngsters, especially those living in underserved, periphery communities, continued to be targeted for program participation. E2K makes a special effort to reach out to these students as their chances to participate in educational enrichment programs are often limited.

## **Teaching methodology**

Excellence 2000 methodology is strongly based on learning as an experiential process that actively involves the student. This process instills motivation and

self-confidence and strengthens science skills. It aims to develop and redefine the approach to learning as a constant aspiration for excellence, an approach that impacts the students, teachers and can resound through the entire education system.

### **Science Adventure curriculum themes during 2006-07**

Science Adventures aim to strengthen E2K academic curricula in each school by providing first hand knowledge of scientific subjects studied in the classroom. Via direct exposure to contemporary science research centers, students are able to observe different phenomena, learn about scientific principles and identify where and how these principles are applied in daily life. Science adventures introduce students to the world around them in an informal, direct manner and encourage them to ask questions, investigate and search for answers on their own. Many of the adventures include hands-on lab experiences under the guidance of expert, professional scientists and technicians. Games and activities which encourage new ways of thinking and provide cognitive challenges are also part of Science Adventure activities.

Scientific and technological themes for the Science Adventures centered on a variety of subjects in the past school year. Forty well-designed activities addressed themes such as these:

The physics of pressure, sound, energy, heat and color  
Aeronautics  
Photosynthesis  
Recycling  
The use of telescopes and microscopes  
Human genome, DNA and molecules  
Laser technology

### **Science Adventure activities during 2006-7**

A wide variety of activities is made available each year. Following are just some of the forty "adventures" from which teachers chose up to three for their students' participation:

"Technoda" Science Mobile Unit, staffed by the Technion, Haifa  
Thinking Clusters: workshops which encourage scientific thinking  
Astronomy MobileUnit, Jordan Valley College  
Astronomy Workshops  
The Kinneret (Sea of Galilee) Comes to You" a study of the sea,  
including a scientific field trip  
Adventures in the Universe  
The Challenge of Life in Space  
Holographics  
Zoology: the world of the goose  
The Clore Science Garden, Weizmann Institute

National Science Museum: Design & Technology, the Technion  
Science around the Sun, Nitzana  
Life & Knowledge, Advanced Laboratories, Kiryat Malachi  
Bloomfield Science Museum, Jerusalem  
Neot Kedumim Biblical Landscape Reserve: Leadership Training  
Untying the Knot / Solving the Problem  
Marine Ecology  
Air Force Museum, Hatzetim

### **Teacher training**

The desire to reach for excellence in the classroom must stem from the teachers. The highly motivated and experienced E2K teachers create an exciting and rewarding educational atmosphere. They participate in training days during which they are instructed how best to present each activity for maximum impact. The time and effort which SEE invests in E2K teachers impacts more than just the E2K students. These teachers influence their students in other classes as well as their professional colleagues who benefit from the renewed enthusiasm for teaching and the innovative methodologies these teachers share with the wider school staff.

### **Evaluation**

Excellence 2000, including Science Adventures, is evaluated in the middle and at the end of every school year. The evaluation is conducted by an independent organization, the Henrietta Szold Institute for Behavioral Science. The program's degree of success is based on the following criteria:

- Long term commitment and participation of teachers in the program
- Stability in the number of student participants and the consistency of group meetings
- Level of interest among the students and their academic progress
- Participation of teachers in professional advancement classes

Teachers (97 percent) and program graduates (85 percent) reported that the science adventures contributed enormously to the total E2K program. Ninety four percent of the teachers stated that the number of adventures should be increased. Seventy six percent of the students reported that Science Adventures activities were a strong motivation for continued enrollment in the program. Both groups feel the enrichment activities should not be changed.

**Science Adventure activities complement the E2K academic curriculum and bring to life topics explored in the classroom. Students are exposed to scientists and researchers in the field which broadens their educational horizons and provides them with role models they can emulate in the future. The experiences provide a unique and exhilarating experience for young scientific adventurers and serve as the impetus for their continued involvement in the world of science and technology.**