

## The Gelfand Science Enrichment Program

### At Yemin Orde Educational Initiatives

#### Project Report – End of Year 2014-2015

Nurturing students' curiosity and excellence in science can open for them a window to the world of knowledge. The Gelfand Science Enrichment Program provides the vision and support to create Village Way opportunities for "**Tikkun Halev**" (to experience educational success and to strengthen a student's self-image by helping him acquire skills such as team work, goal setting, persistence and critical thinking) and "**Anchors in the Future**" (creating accessibility to the field of science as well as developing a future where they can not only access but also lead in the world of science). The Gelfand Science Enrichment Program allows communities to create their own program that fits the needs of the children and youth in their care. A review of all of the feedback we have received from youth and educators emphasizes the importance of the program in the following areas:

- 1) The program provides opportunities in the sciences that these children have never had and would have never had.
- 2) The science activities are fun and interesting which peaks the student's interest in science and curiosity about the world.
- 3) The program offers opportunities for success in which the youth discover new capabilities that they didn't know they had.
- 4) The experience allows the youth "to dream" about their future: both in terms of higher education and in terms of future careers.

We would like to express our gratitude for your continued support of this important program. It is our hope that you garner much pride in reading about the many exciting science enrichment programs that you have made possible for these at-risk youth.

## **ORT Beit HaArava Technological High School**

ORT Beit Ha'arava is a technical high school with over 150 students located in Jerusalem. A tenth grade class participated in year-long meetings that included experiments, demonstrations, field trips and a shared workshop with parents. The school's objectives in participating in the program were to enrich the students' knowledge, increase their motivation and reduce their concerns related to learning; to expose the students to topics of science and technology and equip them with a sense of competence to tackle these subjects. Some of these topics, such as electricity, magnetism and energy were directly related to the main subject the students study. However, since there is no school science or physics program or laboratory equipment, this project was considered a great contribution to the school's curriculum. The students were particularly impressed with the workshops on battery and kaleidoscope construction and especially the preparation of the projects presented at parents' night.

## **Amal Tel Aviv Technological High School**

Amal Tel Aviv Technological High School is the educational home to 130 students, from 9<sup>th</sup> to 12<sup>th</sup> grade. In addition to the high school students, there is an award winning project through which every year 30 girls attend the school and afterwards they join the IDF or serve in National Service. The workshops included experiments and demonstrations on physics, glass blowing and materials/particles/matter. The workshops were all considered of high quality, presented in an interesting way and appropriately



adapted to the students. The glass blowing workshop aroused the most interest. Students and teachers were enthralled. The students said it was very interesting and that the instructor presented it in a fascinating way. Both students and staff reported that the Gelfand Science Enrichment Program workshops were far beyond what they had expected. Students' reactions included: "Where I can go and learn more?" "It was really fun." "It was amazing!" (glass blowing workshop). "Why don't you bring more workshops?" Teachers reactions included: "It is necessary to have these workshops every year." "Next year we should all visit the Weizmann Institute."

## **Amal Shimshon Technology High School**

The Amal Shimshon Technology High School is the educational home to about 100 students in 9<sup>th</sup>-12<sup>th</sup> grades. Graduates are intended to enlist for military service in the Ordinance Corps in the profession that have acquired. Almost all students participated in the series of three workshops. The workshops included experiments with liquid nitrogen and dry ice, the demonstration of scientific explanations of known phenomena and the demonstration of glass blowing for use in the home, industry and art. The students found the Gelfand Science Enrichment Program workshops very meaningful and requested additional scientific activity because Amal Shimshon has no science program and these workshops were the only opportunity for the students to be exposed to scientific concepts and experiments.

### **Aloney Yitzhak**

Aloney Yitzhak is a youth village located near Binyamina that is home to 470 youth. A large number of youth participated in workshops throughout the year. The program goals included developing inquiry skills and scientific thinking and providing the children with experiences of academic success. The workshops gave the students an opportunity for hands-on experience versus the regular lecture-based school learning. In addition they were exposed to a new way of looking at familiar concepts and to new subjects and ideas they had not year considered.



The impact of the Gelfand Science Enrichment Program on students was significant; it aroused their curiosity and increased their motivation to study science.

## **Kfar Hasidim Religious Youth Village**

Kfar Hassidim is a youth village in the north, home to 520 youth including Ethiopians, members of Bnei Menashe (from North-East India), and youth from the former Soviet Union. The school's objectives were to give the students experience



in scientific research, observation and experimentation, data collection, analysis and presentation of results and conclusions. The topics covered included energy, electricity, insulation and conduction, matter and materials, astronomy, physics, magnetism, metal and robots. Student's reaction included: "First of all I loved the topic and the activity. I finally understand the subject for the first time, and learning through trial and error, experimentation and implementation is much more interesting and challenging than the regular way of learning in class." "...Everything I discovered during this activity changed my thinking and knowledge in the field of space and it's really great ..."

### **Branco-Weiss Tachkimoni Hadera**

Branco-Weiss Tachkimoni Hadera is a community high school populated 120 students, most from the lowest socio-economic demographic. Many of the children have dropped out of other schools and all demonstrate academic achievements well below grade level. This year students participated in regular workshops throughout the year at an ecological center. The school's objectives included exposure to the scientific world, to promote the creation and development of initiative all based on the Village Way concept of Tikkun HaLev/Repairing the Heart, and cultivating the world in man. The focus of the program was on topics in environmental science.

The program offered a meaningful experience of learning for the students in previously unfamiliar areas, providing practical experience and opportunities to discover personal strengths and technical abilities that are not reflected in regular school learning. Students' responses included: "I had fun, I loved going to the ecological center, I did not previously know much about what we learned on the subject of fish." "School is not so interesting, that (the science program) was something else."



## Talpiot

Talpiot is a therapeutic community with residential and non-residential facilities for 190 children ages 5-15. This year all children in the residential facilities participated in after-school science activities together with "normative" children from the area. The experience significantly raised their curiosity and interest in science and became a topic of conversation in the community. In particular, the hands-on nature of the workshops contributed greatly to children's familiarity with the field of science, and also created a greater motivation for learning in general.

Here are some quotes from children who participated in the classes:

"The activities were interesting and fun, we learned a lot of interesting things we want to continue the meetings next year ..." - 4<sup>th</sup> grader in special education classroom

"I learned a lot at the meetings, we did a lot of interesting experiments. Because of the classes, I want to learn more about science." - 5<sup>th</sup> grader in special education classroom

In addition to the science activities, children were able to go on a field trip to the science museum in Haifa. The children returned from the tour in awe at seeing various exhibits, and the experiences made a great impression on them.

## Neve Hadassa

Neve Hadassa Youth Village, located near Netanya, is home to 240 youth. Their science activities took place in sophisticated laboratories with advanced equipment, medical simulators, and also at a planetarium, a science park and a museum. Subjects included: physics (Newton's laws, principles of optics, electricity and mechanics); chemistry (structure of matter, chemical reactions, chromatography, polymers, cosmetics and food groups); technology (students learned to recognize technological



systems from everyday life such as how to work an electric kettle, how to produce electricity at power and more); medicine; astronomy (the moon, explanations about comets, the solar system and the structure of the universe). The Gelfand Science Enrichment Program was very diverse and the students thoroughly enjoyed all of the various experiences and experiments and they especially liked the activities in which they made something and could take it home with them.

## ORT Technology Dalyat El Carmel

ORT Technology High School Dalyat El Carmel is home to about 130 students from the Druze community in grades 9<sup>th</sup> – 12<sup>th</sup>. The program had two parts. One was a series of many workshops with a robotics program. The other part included a "Green Energy" series of workshops that focused on the creation of a car that could run on solar energy. The students who participated in the robotics workshops were trained to "teach" parents on Family Day things that they had learned and they also presented the results of scientific activities in which they had participated. It was an opportunity for students to demonstrate their knowledge, ability for self-expression and their leadership skills. The students and parents were very excited about this part of Family Day. The students who participated in the Green Energy workshops also had an opportunity to share their knowledge with their parents. Parents attended a workshop on three-dimensional printing together with their children. Each student designed their own product and at the end of the workshop they printed their design and presented them to the rest of the school afterwards. The parents and children were very enthusiastic about the joint activity, and spoke about the impact these workshops had the students' behavior and improved self-perception. Feedback included:

"These terrific students worked for three consecutive hours without a break. Their practical abilities are pronounced." - A lecturer

"Students are mastering the material. I finally found out how you can fascinate them, and they forgot that there was a break." - A teacher

"Thank you. My son has undergone a transformation, he is another child in the sense that he more relaxed and this is good for him." – A mother

"It was worth coming to school. I enjoyed every minute of the workshop." - Student



## ORT Technology Acco



The ORT Technology High School in Acco is vocational and technical training high school with 120 children with various behavior problems and learning disabilities. 9<sup>th</sup> and 10<sup>th</sup> graders participated in the program which focused on the field of robotics including the use of robots in the modern world, industrial use of robots, and three-dimensional printers. The students learned to design and program a robot according to pre-determined specifications. The Gelfand Science Enrichment Program was a significant learning experience, exposing student to the world of science

and showing them that they can be part of that world.

## Beit HaBoger

Beit HaBoger is a residential therapeutic community housing over 70 teenage boys. This year the young men attended workshops that focused on physics, chemistry, biotechnology, nanotechnology, and physics. The workshops took place at Bar-Ilan University. A special aspect to the program was the connection between the scientific subjects studied and heritage of Israel. The success of the program could be seen in the enthusiastic discussion of the subjects learned and the pride the students took in their participation when they program was presented to all of the parents on Parents' Day.



## ORT Yad Shapira

ORT Yad Shapira High School is a school for about 170 students in 9<sup>th</sup> – 12<sup>th</sup> grade which combines matriculation studies, profession acquisition and employment. This year the program brought the tenth grade class to each of the major science museums around the country for day-long experiential learning activities. The focus of the program was to introduce the students to the implementation of scientific theories to one's day-to-day life. The field trips exposed the students to the latest technology and a view to the future, which made the subjects they were learning in school more interesting to them and strengthened their consideration of technology as relevant future careers. The students discovered in themselves new abilities that they had not seen in themselves previously. ORT Yad Shapira is looking forward to expanding the Gelfand Science Enrichment Program next year.

## Yemin Orde Young Men's Mechina



The Yemin Orde Young Men's Mechina is a gap-year leadership program for immigrant youth located in Hatzor Haglilit. These young men have taken time before beginning their mandatory national service to focus on their own personal development with an eye towards their future.

The goal of the Gelfand Science Enrichment Program for this group is to experientially expose the young men to the field of science in unique and interesting ways in order to expand their knowledge and peak their interest in science. The young men visited the interactive science park and participated in a number of hands-on workshops. The activities included glass-blowing, physical matter and mirrors.

Feedback included:

"We have to keep doing activities that add knowledge ..."

"Really impressive. It gave me new information because before I only knew that glass was made from sand."

"I was shocked by what I saw."

"It was really interesting and fun. I realized things I did not know before ..."

"It was very experiential with a lot of knowledge. I will be happy if next year's group will have more activities ..."

"... made me think about the field of science ..."

## IsraElite Young Women's Mechina

The IsraElite Young Women's Mechina is gap-year leadership program for immigrant youth located in Migdal Ha'emek. Similar to the Young Men's Mechina, these young women are spending the year focusing on their development towards becoming leaders in their national service and beyond. Participants had the opportunity to spend two intensive days at the Weizmann Institute of Science.

The young women attended lectures by the institute staff, conducted laboratory experiments and visited the science park. The program was very successful and opened new horizons for these young women. It provided them with experiences of success that were unfamiliar to them in the field of science and learned about the benefits of scientific study. They were impressed by the connection between science and the history of Israel. Specifically their experience in scientific laboratory experience exposed them to a new experience and gave them a feeling of confidence in their abilities. Feedback includes:



"It expanded my knowledge. It caused me to think about an additional field of study and future occupation. It was interesting."

"I enjoyed it, I learned a lot. I was exposed to a whole world of science and it gave me direction to a field of study. I would like to have the spirit of diligence and passion for research. The fact that I understood everything that was taught here gave me the feeling that 'I can too!'"

"It strengthened in me the aspiration to study higher education. All the lecturers amazed me with their love for what they do. It made me want to strive forward."

"I would never have come here on my own, I would not have been exposed to all this information. I learned a lot made me think about what I will learn in the future. Coming to this place awakens the desire to study at higher levels."

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