Maker Labs

2018 - 2019

Maker labs

A new form of education

After our first year, we realized that if we wanted to continue operating for many years to come, we had to start worrying about continuity. We needed to be certain that our team will always have a next generation of technology leaders. We wanted to be able to combine technological excellence with social activity. To do this, we need to know that new team members come prepared, or at least with the appropriate state of mind.

At the same time, under the leadership of Dr. Yossi Ben-Dov, director of the Reali School system, a new movement of innovative technological education was launched in the school, with the goal of redefining the "adult" and allowing children to learn tools that the regular class cannot impart.

We and the Reali operated because of the same need. Under the common belief that the form of learning must change, and an understanding that FIRST's model and spirit are correct, we embarked on a joint effort with the Reali to lead a new movement in the school. The way they chose to do this was by creating spaces where children could learn independently - The Maker labs.

Today the project is managed with a budget of $ 5,000,000, and involves roughly 3,000 students at the elementary and middle schools of the Reali network on a weekly basis. Next year, it will impact about 4,500 students in all Reali branches.

In this booklet you will find explanations about the labs and all that relates to them. You will also find explanations about fundraising and the presentation that was used for it.

Goals and Vision:

Already in 2016, when the group had just begun its community activities, we had decided that in order to ensure continuity in our community, we must teach the younger generation the basics of science and technology. That way we can help create the next generation of technology leaders. To make such a fundamental change, we needed labs where we could make technology an integral part of the education system to instill the spirit and values of FIRST into all children, even those not in a FIRST team.

We wanted to have the opportunity to give young children tools, such as FIRST, to help them in the future. With tools like learning methods, openness, and engineering professionalism, we can prepare young children for the world of the future, for jobs that do not yet exist, for the use of technology that has not yet been invented, and for solving problems that have not yet happened.

We defined two clear objectives:

- Making technology an inseparable part of the other classes, from printing old coins in a Bible lesson, to making models of atoms in chemistry.

- Creating a place where children can learn science and technology through projects when all means– of manufacturing, thinking and learning– are deployed before them, and let their only limits be their imagination and determination.

The broader pedagogical thought behind the project is that we must change the form of education and adapt the school model to the 21st century, to ensure that Israel remains a Startup Nation even in fifty years. The Way We Chose: The Reali School will adopt and lead to a change in the educational method and in the way that skills and knowledge are transferred to the student. The educational approach is based on an independent learning of the student, through experience, with the teacher guiding and mediating knowledge, as opposed to the usual “lecture based” form of learning.

Fundraising:

The vision presented to our school demanded much. The labs, which needed to be the center of a new form of learning, must meet the requirements. To do this, the labs must have all the tools to make this learning possible. The lack of resources could not be what limits the students. They must be able to dream big. For this, the school had to raise a significant budget. A budget that will enable not only the construction of well-equipped labs, but also aesthetic complexes that will be pleasant to study in. A budget that will allow children to print in 3D, laser cut and work with industrial tooling. A budget that will really allow us to create a new form of education.

There is a reason that FIRST is so demanding, in all respects - only when the challenge is so hard is the experience truly powerful. So, together with the school, we decided that in order to do this, we need to think big and influence all aspects of traditional learning.

We came up with a five-step work plan:

1. Vision and goals -

Together with the school we have clearly defined where we are going and what we want, so we could know exactly what this project requires from us.

2. Mapping potential sponsors -

This phase was led by the school. The goal was to know which potential sponsors could invest significant sums in such a project. Out of such a large economic demand, the school initiated the mapping and referral to sponsors. The school chose to put the most emphasis on school graduates, because we believed they could help us put the school into a new era of education.

3. Preparing a plan of action, materials and a presentation:

After mapping possible sponsors, we could plan the recruitment process together with the school. We found a major potential donor (who remained anonymous) and prepared. Our job was to prepare the materials, presentation and tools to raise the money. We worked with mentors and people in the field– in particular Danny Rolls and Alon Wolf, parents of team members– to prepare the various materials.

4. Preparing the presenters -

Because of the great importance of the presentation and its professional character, the school's principal, Dr. Yossi Ben Dov, presented to the potential donor. To make sure the messages are correct, and pass as planned in the presentation, our mentors (Danny and Alon) worked with him on the manner of the presentation and its content in preparation.

5. Raising the donation

Thanks to the planning and implementation of the school’s and our work program, a huge donation of $ 5,000,000 has been raised that enabled us to lead a new form of education in the school.

Today, the labs are the school's learning center, and the new form of education affects every aspect of the school.

The donation:

The donation itself came from an anonymous donor who is a graduate of the school. The materials for the presentation were prepared by us, while Yossi Ben-Dov and the school referred to the donor and presented to them.

We wanted to have the labs operating as early as 2018, so four of them were already established in three branches by 2017. The labs were established at:

- Reali “Hadar”
- Reali “Ahuza” middle school
- Reali “Ahuza” elementary school
- Reali “Matos”

Last summer, another lab was built in “Beit Biram”, Reali's high school. Part of the donation will be used for the establishment of a technological kindergarten in the Carmel Center next year.

	Hadar	Ahuza	Matos	Beit Biram
Maker Work Space	$250k	$250k	$250k	$250k
Distribution Work Space	$750k	$750k	$750k	$750k
Teacher Training	$100k	$100k	$100k	$100k

The Reali:

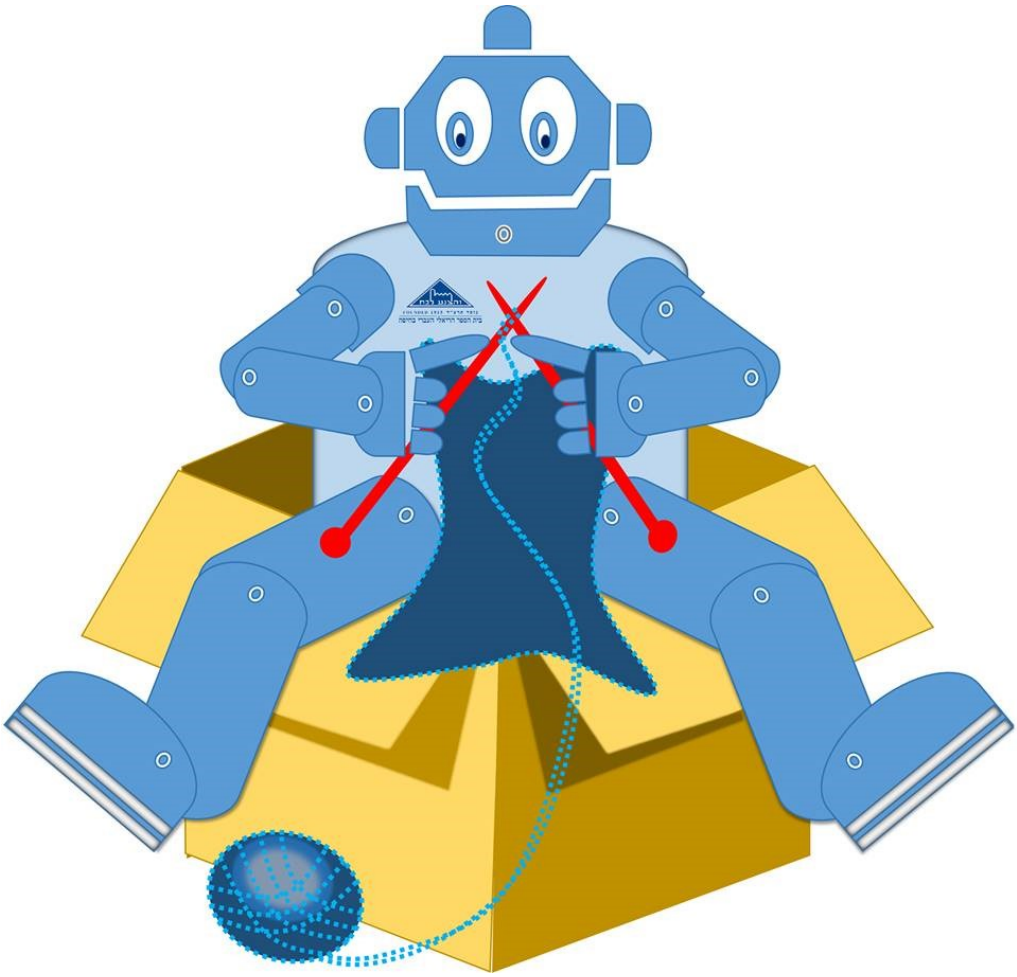
The school was responsible for the presentation itself and we were there to guide the process and prepare the materials.

Dr. Yossi Ben-Dov, the school CEO, led the process from start to finish, working with us on the materials and finally presenting to the donor.

The Reali was an amazing partner in the process, and it was through their initiative, alongside our initiative, that we were able to come so far with our shared vision.

Nowadays, the Reali is moving the plans into the future and we are there to help with anything they need. Uzi Rosen, the team's mentor and school teacher, has been in charge of the field of technology in Reali and is working with us on establishing the work method.

The Maker's movement of the school created a logo, and it marks the innovation that the movement defines itself as:



The Maker Lab in "Matos":

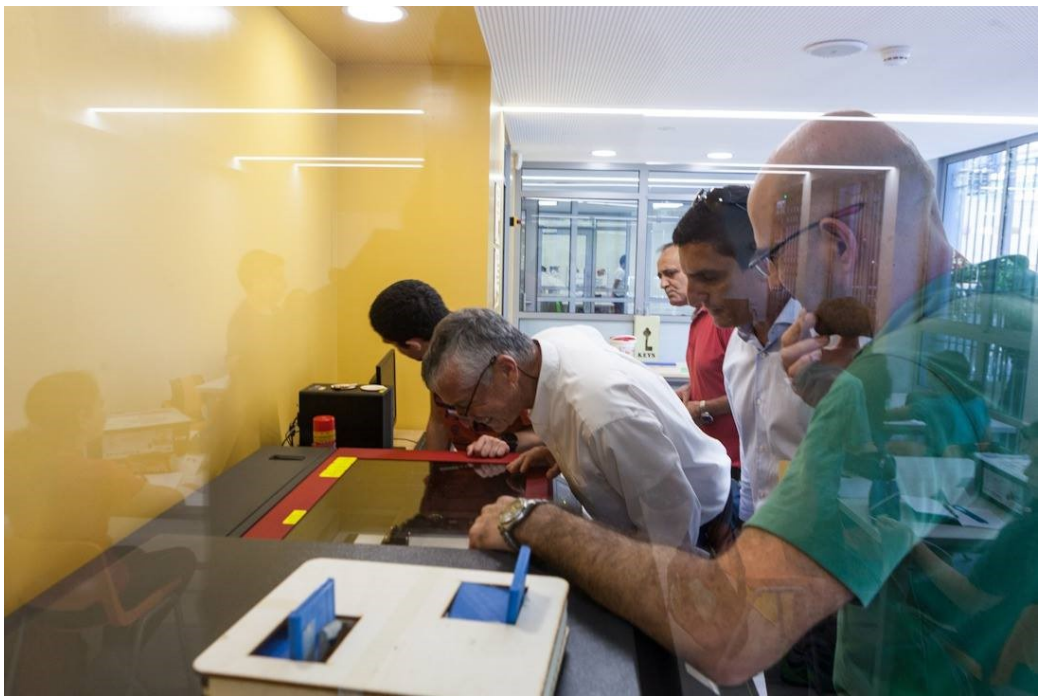
As part of our vision of making a fundamental change in the education system, in January 2017 we started our journey in order to build the Maker Labs in school.

The goal was to give the students a convenient place to study in a technological way, in the mindset of a "maker". In the future, there will be a need to solve problems that don't exist yet using tools that haven't been invented yet. This is the role of the Makers.

We contacted the school's principal, Yossi Ben-Dov, in order to contact an anonymous donor who gave the school a donation of 5 million dollars for the purpose of building the labs. Using the labs we enable many children to explore the world of science and technology on their own. The labs let the students choose their project and the way they want to produce it, while the teachers provide support and assistance, just like mentors in FIRST.

The lab gives the students at the "Matos" branch a place to study science, technology, and robotics with a variety of tools at their disposal.

The lab also provides a quality work place for the FLL and the FTC teams operating in it. It's employees are managers and workers, some of them alumni of our team who guide the students.



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The first Maker Lab was in the "Hadar" branch. It combines a "clean" room and a "messy" room to give children a try in all areas. After the lab was built in the Hadar branch, labs were built in other branches of the Reali. These labs allow children to celebrate science and technology at an early age so when they grow up they can join the world of FIRST as well.

The Maker Lab in "Ahuza" elementary:

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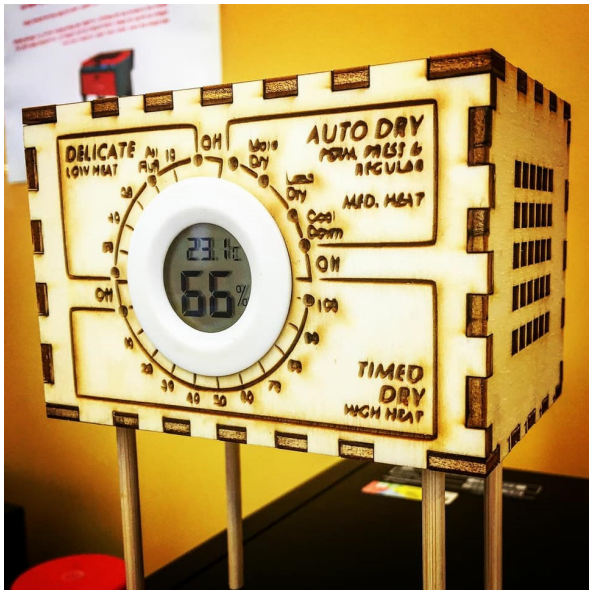
After the completion of the Maker Lab in "Ahuza" elementary we officially had a Maker Lab in each elementary school.

After building the labs at the Hadar and Matos branches, we set out to build the last lab in the Ahuza branch in 2017. The lab now has sewing machines, kitchen appliances, computers, and work areas, and it is the largest of all the labs, so we can work with a large number of students at once. The tools and space that the Maker Lab has really shows the way makers are supposed to work.

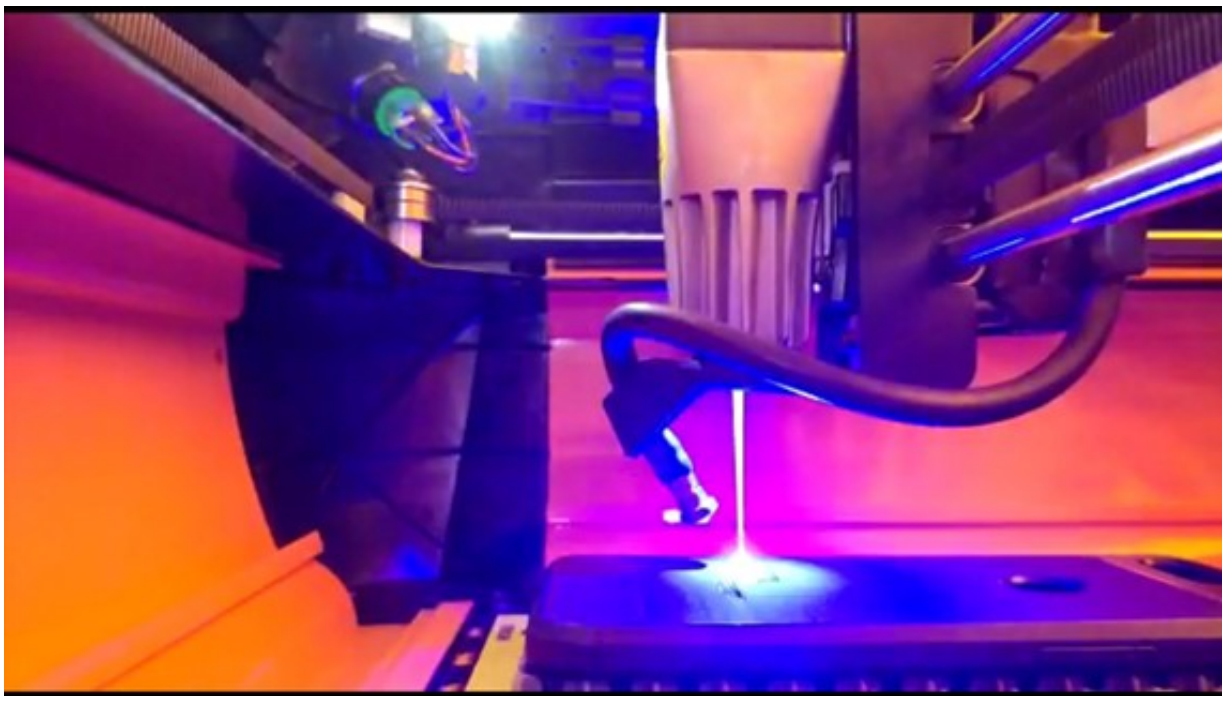


The Maker Lab at Beit Biram:

In the summer of 2018 it finally happened, the fourth lab was built in “Beit Biram” the school’s high school branch, which meant we actually got to have a lab in every branch. The lab that was built includes a large work area, a tool workshop, and new computers for video editing and graphic design. The lab is used by students in entrepreneurship, art, and design classes, which are new and great for the innovative style that the lab is built in. 1500 “Beit Biram” students use the lab on a daily basis and have access to 3D printers and other equipment that enables them to create and invent.

The Maker Lab in "Ahuza" middle school:

In the summer of 2018, a second Maker Lab opened in the "Ahuza" branch and the fifth of the total. The laboratory is equipped with the best tools, from 3D printers to manual tools to laser cutting machines. The lab holds innovative and powerful computers designed to make sure that no matter what it is that students want to invent or produce, they will always have the tools and the option.




Die Welt
Erscheint jeden Freitag.
Basel, 27. August 1903 — 4. Elul 5663.
Eine Erklärung der englischen Regierung.
Ministerium des Äusseren.

Students at the Maker Labs:

The labs provide students with a technological learning environment in all subjects of the school. During the day, students can be seen in laboratories working on various projects: 3D design of projects for various classes. For example: modeling and printing an ancient Greek building for a history lesson, preparing games that can be used by blind kids, printing old coins for bible class, etc. The labs enable each teacher to introduce different technologies to each grade and class, while teaching STEAM values.

The school's learning approach (before we arrived) was learning through projects. The idea was that with independent projects, and teamwork, children can get tools that the standard class can not provide. The labs allow us to take this thinking forward significantly, because the projects move from the two-dimensional paper to the physical space. The children no longer write about coins from 1000 years ago, they print them. In this way, the children's' way of thinking expands and the boundaries go beyond just writing, they can actually produce their own creations. The more a child knows, the more he can do, and so the children are encouraged to work hard and study the tools of the labs and thus go further and create more complex creations

The labs have staff in them at every school hour. The teachers let the children work independently instead of teaching themselves, and we already see how dramatic this change is. After school, the lab is ready to work with the FIRST teams. JRFLL, FLL and FTC students enter the lab and start working on their projects. Thanks to the fact that all the teams work in the same area, there is cooperation between them and the veteran teams mentor the younger and new teams. In a formal and informal way.

Galaxia at the Maker Labs:

Galaxia is evident in the lab's function.

For example, one of our mentors, Uzi Rosen, who is also one of the founders of the group, now works throughout our school as a teacher responsible for the subjects that relate to technology in the school system.

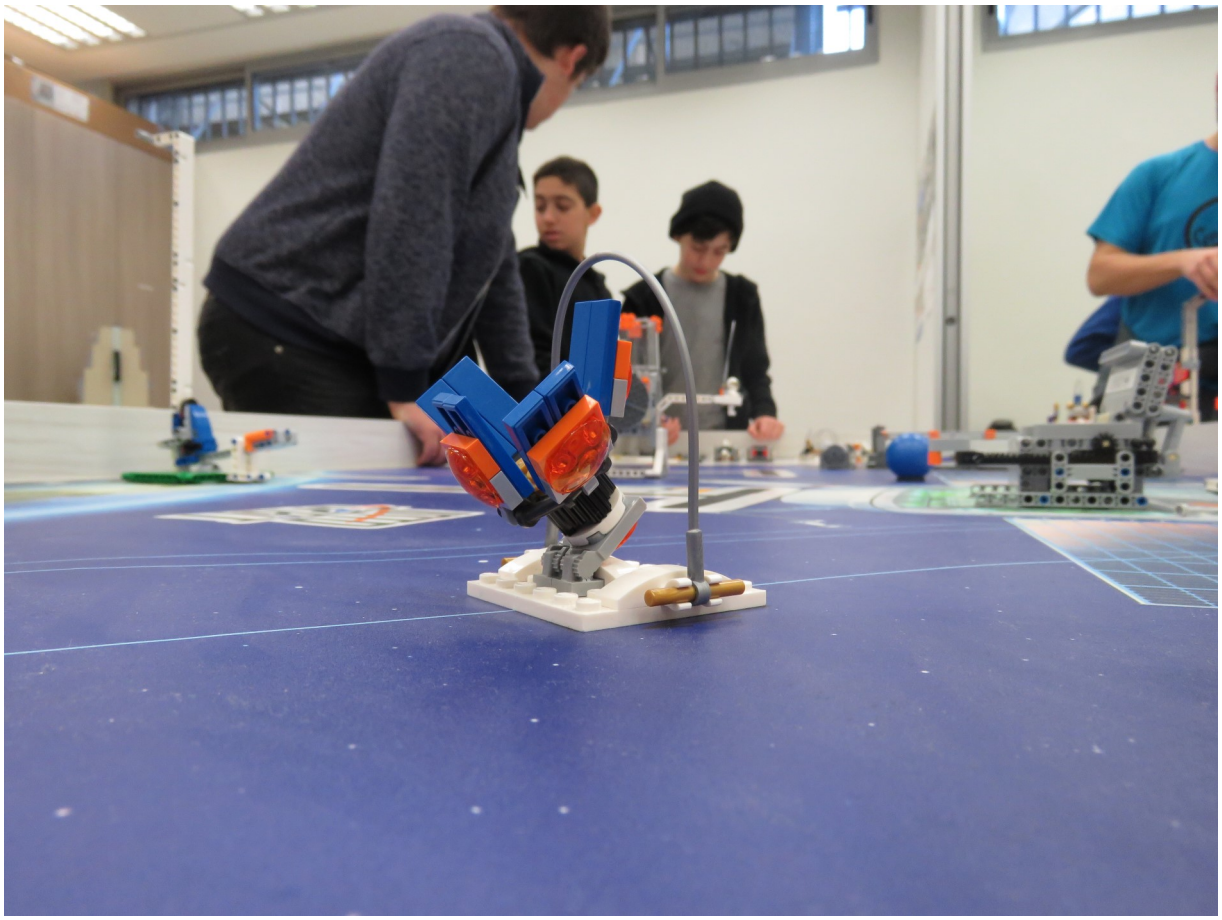
In addition, because of the tremendous potential of the laboratories, and the quality equipment that exists in each of them, after school hours, they become the center of the FIRST teams in the branches. They serve as home to the JRFLL, FLL and FTC teams working together in partnership.

To implement the spirit and principles of FIRST into the labs even more, some of our team graduates get jobs as lab managers and workers until they are drafted. So after they finish their studies and wait for the draft, they can continue to do what they love and at the same time get rewarded for their work.

Sometimes, you can also see a reverse process in which the labs affect Galaxia, such as our chief technical mentor last year, Yarden Lunberg, who before becoming a Galaxia mentor worked in the Maker Labs and was the mentor of one of our FLL teams.

The FIRST teams in the Maker Labs:

The labs are the workplaces of each of the Reali teams. The teams work in separate rooms in each lab according to their plan: the JRFLL, the FLL, and the FTC separately. Each program has the right equipment for its work: computers and equipment for JRFLL and FLL, and equipment for production and electronics for the FTC. The cooperation in the workplace allows teams to help each other during their working hours, allowing our FTC team to monitor the FLL team at its branch.



Alumni in the Maker Labs

In order to bring the spirit of FIRST into the labs consistently during the daily lessons, while providing our graduates with interesting and educational work on subjects that interest them until the military draft, the graduates can get jobs as managers or workers of the labs until their recruitment.

Today most of our alumni who have worked at the labs have enlisted and can not work anymore, but at the beginning of next year, our next group of graduates will take their place and begin their work at the labs.

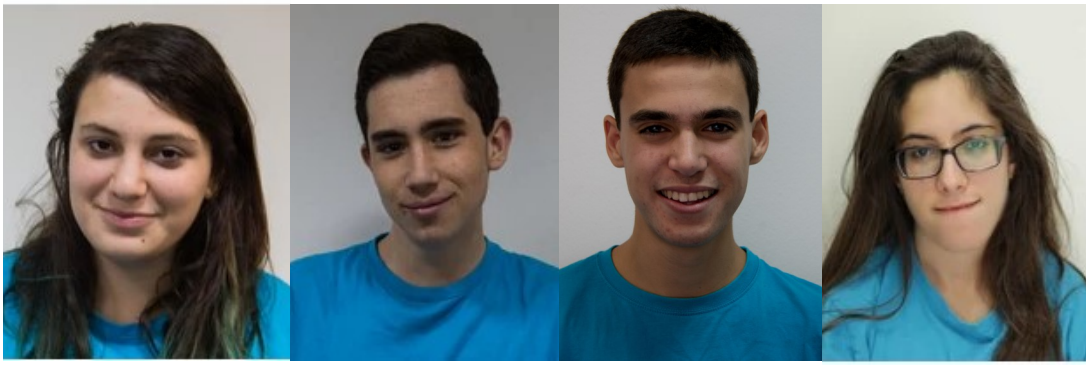
Examples of alumni working in the labs and their roles:

Dana Amit - Dana was the captain of the group for two years. After completing her time in Galaxia, she began working in the Reali “Hadar” lab as a manager. She was responsible for managing resources, helping teachers and students, and contributed to the engineering knowledge she had accumulated in the team. In addition to her role, she also assisted in monitoring the FLL teams in the labs.

Ido Yakobovich- Ido worked in the “Matos” Maker Lab. He was responsible for the maintenance of the equipment and organization, the transfer of content to teachers and students, and help during classes. In addition to working in the lab, he also mentored FTC team Supernova #11567 as a technical mentor, and also helped them in the team's organizations.

Gal Francis– Gal worked in the “Matos” lab. He helped the students during the day, guided them, taught them, worked with them and motivated them to work. He shared the technical knowledge he got from working in the team. He also mentored an FLL team.

Omer Schneider - Omer works at the “Hadar” Maker Lab where she passes on her experience and technical abilities to all the students.



Plans for the future:

Today, all five laboratories designed in each branch have been established. The exception is the “Ahuza” branch with two laboratories, one in the elementary school, and one in the middle school. In addition, next year the equipment in the laboratories will be upgraded to give the students all the resources to express their creativity and work however they like.

In order to make sure that the labs are perfect and improve each year, we make sure to think ahead and make future plans.

In order to improve the way teachers support students during their learning and project preparation, we strive to provide teachers with more in-depth training on the new way of education in which teachers function as mentors.

In addition, to expand the impact of STEAM and teach children about science and technology from an early age, we want to start with the youngest generation, kindergarten children. At the beginning of the year, a technological kindergarten was established at the “Matos” Branch

Kindergarten children will be able to experience science and technology regularly throughout all their years of education and development, from simple planning in 3D in the kindergarten, to building complex robots in the twelfth grade.

Galaxia #5987 In memory of David Zohar

והצנע לכת

FOUNDED 1913 נוסד תרע”ד

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WIRTHEIM

Because one of us is a lone star

But together we are a galaxy!