2022 Annual Report

Bloomfield
Science Museum
Jerusalem

This year we marked the 30th anniversary of the Museum's establishment.

Alongside the celebratory activities, and as befits birthdays, this year invited reminiscing, introspection and looking towards the future. This year we said goodbye to some wonderful staff members who have been with us since the beginning- and whose contributions to the Museum cannot be overstated- and recruited a young and talented team to accompany us the rest of the way. We met new challenges that awaited us alongside the familiar ones, worked hard and achieved much. Without a doubt, it was a fascinating year.

This year, after much deliberation, **we chose an exhibition titled (surprisingly): "Birthday"** as our central exhibition.

With the help of current and veteran Museum staff members, we selected 30 beloved exhibits from an array of past exhibitions. We created connections between them and "dressed" them up anew with the help of Prof. Hanan de Lange - the designer responsible for the original design of all the exhibitions and exhibits presented at the opening of the Museum, thirty years ago.

In the center of the exhibition we planted a "tree", hung with exhibits of the past as ripe fruits. Visitors are invited to look at the roots of the tree through a transparent floor and by way of electric trains that bear cameras and weave between the roots and the colorful trunk.

Around the tree you can find a special pendulum - developed in the Museum - that draws fantastic shapes on a photochromic surface, handles whose rotation produces waves, gears that move each other without touching, air cannons that wave colorful sheets, hanging panes whose color is revealed only when viewed through a polarizer and 25 other wonderful exhibits.



• The summer exhibition and program were supported by the Bloomfield family.





Inspiration Lab for All

The general public was invited to take part in a special **treasure hunt** that took them on a journey that reunited them with favorite exhibits, watch mind - blowing demonstrations and shows, and build and sail their own "wishing boat".

The walls of the exhibition space and tree were "wrapped" by Orit Bergman's illustrations of birthday gifts and an illustrated timeline of the Museum's major exhibitions over the past 30 years. We were delighted to see young parents reminiscing about exhibitions they remembered from their own childhoods, alongside grandparents, guides and staff members from the past, smiling in front of the timeline and the many happy memories it evoked.







We chose to change our branding.
After a fascinating strategic process that took place with the help of external consultants, we decided to change the Museum's original slogan, "To see, to touch, to know", to a new logo and design. We identified that our unique value to society lies in the fact that we are an **"inspiration lab"**- a place where inquiry and creativity are encouraged, where curiosity is the driving force, and where each and every visitor feels welcomed, capable and belonged.
An open and inviting place, dynamic, creative and exuberant, Jerusalemite and contemporary -
a place for everyone.

We chose to update the Museum's website, adapting it to the changing needs of society. With the understanding that the site is an integral part of the Museum, we remade it to be the welcoming face of the Museum and a window into its extensive activities. The new website is used by visitors who come to the Museum, along with many other virtual visitors.



We created online catalogs for our exhibits and exhibitions. We developed online learning spaces where teachers, children and their parents can experience and take part in scientific research activities. We put together a collection of guided science experiments that can be done at home, in the classroom and anywhere. We established educational enrichment spaces in the Museum's areas of specialization: the world of Make in education, science and gender. And like all activities in the Museum, the content on the website is accessible in Hebrew and Arabic as well as a large part in English.

Above all -
we believe in the value of collaborations.
We work in constant spheres of cooperation - between Museum staff and researchers from academia and engineers from industry, together with cultural bodies and artists, organizations in Israel in our professional field, with the authorities - the Jerusalem municipality and various government ministries, philanthropic foundations, and national initiatives.

Alongside our local activities, we see great importance in creating collaborations with our colleagues overseas. In 2022, we hosted partners from 12 countries for a workshop as part of **"Make it Open"**, a three-year project funded by the EU that creates infrastructure for open schooling and gives teachers tools to teach science with - and for - the community. After the pause dictated by the global pandemic, we were happy to host **'Israel Make and Education Week'** again, as well as host international researchers at the **Fab learn** conference and master class; together we opened up avenues and opportunities that we will continue to pursue in the coming years.





This year we joined the **Scratch** Foundation, which promotes computational thinking for children around the world. We returned to in-person international activities and conferences; we presented at the annual conference of **Ecsite** - the organization of science museums of Europe, and at the annual conference of **Eusea** - the European Association for Science Engagement Association. We sent outstanding high school students to competitions: **EUCYS** - in Europe, **ISEF** - in the USA, as well as to research camps in Europe. Throughout the year, we continued to hold regular online meetings with colleagues from abroad around topics of interest to our professional community.

In the following summary we will briefly describe the main areas of activity - local and international - in which we operated over the past year.

Make and Education Week

After a two-year hiatus due to the Corona pandemic, we were happy to again lead **Israel Make and Education Week**, together with MindCET and Mifras (Educational Entrepreneurship Incubator) and with the support of The Bracha Foundation. At the annual conference in Expo Tel Aviv, we hosted experts from Israel and around the world with whom we examined the overlapping contexts between Make pedagogy and the tools of SEL (Social Emotional Learning). Together with the participants of the conference, we established a connective infrastructure between the two and formulated courses of action.



In the master classes we held at the Museum, we brought together educators and leading Makers to experiment with technological tools and innovative pedagogical approaches. In addition, we held a **Maker Faire**, where families and members of the public were invited for an inspiring meeting with Israeli Makers. We were happy to meet the Makers, to hear what motivates and challenges them, what their dreams are, how they came to be Makers.



Young Scientists

After two years of holding our 'Young Scientists and Developers Competition' online, we were happy to be able to hold it in-person again at the Museum. For the 25th consecutive year, boys and girls from all over the country - Jews and Arabs, secular and religious, from the center and the periphery - submitted projects representing a wide range of topics from different fields of knowledge: natural sciences, technology, humanities, social sciences as well as various interdisciplinary studies that are difficult to categorize. This year, 201 outstanding works were submitted to the competition and 45 works reached the final stage.

Projects that advanced to the final stage are displayed on the Museum's updated website accompanied by short explanatory videos as a tool to encourage other students to submit their work and to expose students to the great variety of fields of knowledge - and the strong connections between them - as reflected in the world of research and academia. Winners of the competition represent Israel in international competitions in Europe, the USA and research.

Mabat program

"**Excellence in Technological Education**" (Mabat) is a unique three-year program of the Ministry of Education that allows outstanding students to integrate technology- based research projects into the course of their regular studies. Throughout the year, we accompany the Ministry of Education team and assist in formulating the outline of the program. In 2023, Mabat students will join the 'Young Scientists and Developers Competition' with high-quality technological projects.

Programs for Schools

Again this year, tens of thousands of students attended our innovative science sessions on diverse topics. This year we added to the wide variety of new topics **'Following Leonardo'**, that was particularly suited for classes in the fields of science and physics as well as for classes interested in exploring the Renaissance period in general. We enjoy seeing how students use the exhibits to learn independently as they gain a deeper understanding of the exhibition's content and its possibilities.

For kindergarteners this year we developed **'A Bite Of Medicine'**, an activity that allows some of our youngest students a glimpse into the world of doctors. The activity, which takes place at the much loved 'Teddy Bear Clinic', includes a variety of stations that invite children to learn about routine medical examinations as well as the history and technology behind the medical equipment used by doctors. In this way, it also helps to reduce children's anxiety about doctors visits and medical tools. As part of the activity, the children were also given an experiential session on the topic of balance.



Additionally, with the cooperation and funding of the Jerusalem Municipality's Education Administration, we developed and delivered a Make cardboard construction activity for kindergarten children and their parents to 50 classes throughout the city. We also participated in a parent/child project in Arabic-speaking kindergartens in East Jerusalem that focused on promoting sustainability.



Youth Parliament

For over ten consecutive years, **a scientific parliament for Jerusalem youth** has been held at the Museum under the auspices of and in cooperation with the Department of Science and Technology in the Jerusalem Municipality's Education Administration. The parliament, intended for 9th-11th grade students in the city, focuses on the social and ethical issues surrounding current scientific and technological developments and research. This year the parliament dealt with the climate crisis and included youth from 14 high schools around the city who came to the Museum for three days of discussions and meetings with researchers and experts on food, consumerism and fashion, transportation and urban nature.

The students divided into committees, studied the field in-depth, and prepared a lesson plan and activity which they will present to their schools and to other schools in the city. In addition, the students drafted a survey to collect data on the attitudes of the city's residents surrounding these issues. Some participants of the parliament subsequently joined the youth leadership wing of the Jerusalem municipality to promote the issue of the climate crisis.







Summer Camp

After last year's successful pilot, this year we expanded our innovative **'Growing Science'** camp - a collaboration between the Museum and the nearby University's botanical garden. At the camp we hosted over 60 children aged 8-11 in four groups, one of them expressly for Arabic speakers.

The summer camp took place over two weeks, during which the children spent eight hours a day in the botanical garden and the Museum engaged in a variety of unique activities on the following topics: treasures of the earth, the weather, energy and food, tracking and detective work, medicine and more.



Spring event ~ “A Common Thread”

As part of our preoccupation with the global climate crisis, this year we made ‘fabric’ the focus of our 2022 Passover event. As part of the event, visitors could discover the wonders of fabric, learn about the fabric production process, discover where our clothes come from, and investigate what the clothes we wear are actually made of. Throughout the event, the audience was invited to think about the fashion industry and the environmental damage it causes, take part in a variety of activities, and create new useful products from old clothing in order to reduce toxic waste.



Teacher development ~ computational thinking

As part of the development training we provided to teachers this year, we focused on two areas: the implementation of the “Open Schooling” approach in schools, and the connections between computational thinking, code and the world of Make. We started by helping teachers from 15 schools adopt and implement the “open schooling" approach in their schools.



We held a 30-hour training course for elementary and junior high-school science teachers dealing with the world of technology, where we taught about controllers, sensors and electronic components in the Museum’s Make lab. As part of further training, the teachers created games and escape boxes related to the curriculum and became adept in connecting the physical and the digital learning. We were pleased to see that after the training, almost all the teachers started using Microbits (micro:bit) in their classrooms.

Frontiers For Young Minds: Science for Young People

This is the 5th year that the Museum has published the scientific journal 'Frontiers for Young Minds' in Hebrew.

Accompanied by a scientific steering team and youth council, under the scientific supervision of Prof. Idan Segev and with the support of the Sagol Network, the Museum has so far published over 575 articles in Hebrew, including 186 this year. The articles are written by leading scientists from Israel and abroad and reviewed by young people.

In 2022, as a response to the challenge posed by the Ministry of Education in the field of climate change, our team developed a unique learning scenario for teachers based on articles from the journal and presented it at various conferences and events. In addition, the team led reviews articles written by scientists and reviewed by students as well as produced engaging TikTok videos about selected articles.

One of the highlights of the year was an extraordinary scientific conference that took place over Hanukkah. Five-hundred teenagers and their parents attended the launch of a new Frontiers magazine featuring articles written by Nobel prize winners.

Participants listened to Prof. Aaron Ciechanover, winner of the Nobel Prize in Chemistry, tell about his adventures in science and answer questions, watched a stand-up comedy show about science, and heard from Prof. Dafna Sheahaf about if - and how - computers can be taught to understand humor and make jokes.



Learning spaces



With support by The Jerusalem Foundation, and in cooperation with Beta Educators- the innovation arm of the Jerusalem Municipality's Education Administration- we initiated a pioneering educational program at the Museum. Junior-high school students from West and East Jerusalem attended a six-session series of long learning days at the Museum, taught by Museum guides together with the teachers. Museum staff assisted the teachers at every stage, from the creation of lesson plans to the use of Museum space and exhibitions.

The program allows students to feel at home in the Museum and to realize that it is possible to engage in deep learning outside the classroom setting. Simultaneously, the program provides teachers tools for effective teaching outside the classroom.

In the 2021-2022 academic year we hosted 18 classes (9 from West Jerusalem and 9 from East Jerusalem) in two rounds, and in the 2022 - 2023 academic year we hosted 19 classes (10 from East Jerusalem and 9 from West). This year the teachers are following the 'zero waste' learning scenario developed as part of **Make It Open**, the EU-funded project led by the Museum.





Citizen Science ~ Jerusalemites involved in their environment

This year too, we continued to work to increase public awareness to the climate crisis and its environmental challenges. After consultations and in-depth study of what is being done in Israel and abroad- and with support from the Innovation Fund of The Jerusalem Foundation and The Mandel Foundation- we developed an environmental monitoring program, with an emphasis on aspects related to urban planning.

With the help of our strategic partners from the various departments of the Jerusalem municipality, and with the advice and assistance of researchers from the New Academic Center of Sustainability of Hebrew University, we decided to focus on two topics that affect urban planning: **shade and air quality**. We chose '**walkability**' as a concept that combines the two issues, and to examine it together with school students 'on the way to school'. With the assistance of the New Academic Center for Sustainability of the Hebrew University and researchers from Tel Aviv University, we developed customized measuring kits and data collection protocols which could be used by by students and members of the community.
In the 2021-2022 academic year, we conducted a pilot with students from grades 7-9 from three schools around the city. The students planned walking routes, took measurements, analyzed the data and presented it to their classmates and learned and taught about the importance of environmental testing and monitoring.

Following the pilot, we held a launch event together with the New Academic Center for Sustainability, where about a hundred stakeholders from government offices, municipal departments, civic organizations and the community were present. Following the event, ideas for additional courses of action for the project were put in place.

Make Wednesdays

This year we developed a new and unique concept: **Make adult/child workshops**. Held in the Museum's Make lab, the workshops encourage joint learning while strengthening a variety of skills, with an emphasis on integrating SEL - **Social Emotional Learning**. The workshops, which were opened to the public in December, are delivered by Museum guides who receive specialized training from the Museum's team of Makers. Participants are given the use of a variety of technological tools as they work together to create an end product that they take home. Every month the public is offered a different workshop on a new topic; the first workshop dealt with the design of glassware while experimenting with sandblasting technology.

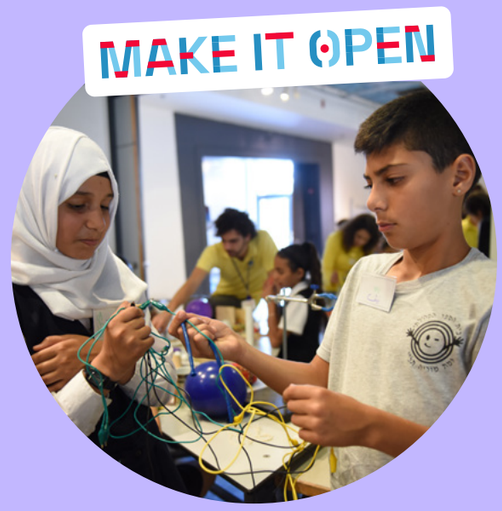


Make It Open

A project funded by the European Union and led by the Museum together with partners from 12 European countries with the aim of promoting Open Schooling for Science, Technology, Engineering & Math (STEM) learning in collaboration with the community. The learning is based around relevant challenges to the world of the learners, and are delivered through unique pedagogical and digital tools that involve stakeholders from the community.

During the year, learning scenarios were developed around a selection of topics. Teachers were offered up-to-date teaching materials in STEAM and an online navigation platform ("the navigator") that makes the content and resources accessible in a user - friendly and interactive way. In the coming year, we will start the next phase: disseminating the project materials through the development of a Massive Open Online Course (MOOC) for teachers and educators in Europe and Israel.

In each of the 10 participating countries, communities of teachers - in collaboration with various community organizations and experts (hubs) - will adapt, assimilate and implement the project's outcomes into local schools. All the development work is accompanied by a Proof of Concept evaluation team, which examines the ability of each learning scenario to be implemented in other countries and schools.



This year, like every year, **equity and accessibility** were top priorities for our team, and we worked tirelessly to create a welcoming space where everyone has the opportunity to fully and actively participate in the many programs the Museum offers.

Quiet time

Due to high demand, this year we significantly increased the number of times we offered 'quiet time' - quiet visiting hours for families with children with special needs. With a discounted price, a limited number of visitors and a reinforced team of trained guides, quiet time allows children and family members to spend quality, scientific family time in a quiet, accessible and empowering environment.

Events for the Arab society

This year the Museum held a number of culturally tailored, unique events over the Arab society's holidays and school vacations. Through targeted marketing, and with the help of influencers from within Arab society, this year we managed to increase exposure and reach more interested parties. The events that were held were very successful with residents of Jerusalem and the surrounding areas as well as with residents of the center and the north of the country who came specially for them.

Israeli Shabbat

Again this year we offered free entry on Fridays and Saturdays as part of the Ministry of Culture and Sport's 'Israeli Shabbat' program. For many of the families who visited us over the weekends of 2022, it was their first opportunity to get to know the Museum and its activities. The "Israeli Shabbat" program is an opportunity for us as well, to make the Museum accessible to everyone and to provide Jerusalem families with lifelong memories.

Special Education

Equity and inclusion are an integral part of the Museum's everyday language and culture, and beyond '**quiet time**' hours- which are in high demand and fill up quickly- and our routine and extensive activities with educational institutions, this year we held an ongoing activity with the 'Beit Hazayar' school, in which we gave students a course on digital engraving (CNC machine). Over eight sessions, students learned how to learn and work independently on a project in the Make lab.







Ultra-orthodox (haredi) society

This year, too, we were happy to host members of the ultra-Orthodox public as a broad audience and as students through the education system and other educational frameworks. After several years of scientific pedagogical consulting for municipal programs funded by The Cleveland Federation, this year we initiated an 80-hour course, funded by The Jerusalem Foundation and the Kivun Center - the employment training center of the Jerusalem Municipality and the Ministry of Economy, for instructors from the ultra-orthodox sector in informal science education. Fourteen ultra-orthodox yeshiva students took part, some of whom have already begun teaching in various frameworks throughout the city.



Make classes for enrichment and promoting tolerance

This year we started two types of enrichment classes for children and teenagers that incorporate engineering and Make: The first one, funded by The Jerusalem Foundation, is a class that integrates children from East and West Jerusalem. The second, funded by the Ministry of Innovation, Science and Technology, is for children from families with low science capital from the Arab and ultra-orthodox sectors. Two groups participated in the integrated enrichment classes; the joint activities encouraged direct communication between the participants, cooperation and teamwork. Four groups from the Arab sector and two groups from the ultra-orthodox sector participated in the Make classes.



Science capital training courses for teachers

As part of a collaboration with the JDC Israel, this year we developed a unit on “science capital” for integration into teacher development courses. The program is based on a concept developed by Prof. Louise Archer from UCL University in London and her research group, and was created with their professional guidance.
The unit was developed with the aim of giving teachers the tools for mapping the science capital in their classroom and teaching methods to increase the sciencetific capital of the students, with the understanding that increasing science capital is a lever for social mobility and an important step in promoting equity. The teaching unit was drafted and delivered to teachers several times by the Museum team and is currently being integrated into programs led by the JDC together with the Ministry of Education.



Make Roof

This year we opened the roof next to the Make lab as a usable activity area, and it quickly became a favorite among visitors and staff. The roof, which was renovated and made ready for use with the support of The Bracha Foundation and the municipality, overlooks the Museum's courtyards and can be seen from the Sderot Rupin promenade. The unique design combined with new activities created by the Museum's development team makes the roof an inviting space for the diverse variety of events that are held there, and provides all our visitors with an opportunity to experience the thrill of taking part in workshops and encountering new challenges in an outdoor setting.



Bloomfield
Science Museum
Jerusalem

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