

The LearningWorks

Thank you for your interest in The Jerusalem HackerCamp, 2016. We hope you'll find answers to many of your questions in this guide. Once you've read it and have further questions please feel free to be in touch.

Email: info@thelearningworks.org

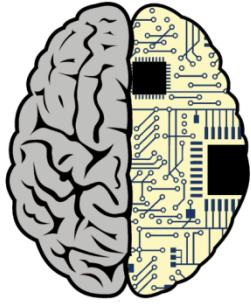
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The LearningWorks

2016 Jerusalem HackerCamp Guide

WHEN?

Sundays-Thursdays

First day: Thursday, June 29th

Last day: Thursday August 18th

Campus Days are 09:30-15:00. Slightly more than half of our days fall into this category.

| July | | | | | | |
|------|----|----|----|----|----|----|
| S | M | T | W | T | F | S |
| | | | 29 | 30 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |

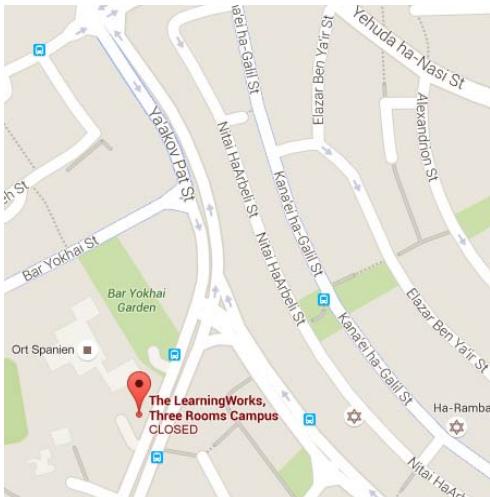
| August | | | | | | |
|--------|----|----|----|----|----|----|
| S | M | T | W | T | F | S |
| 31 | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |

Exploration Days may include early morning activities, evening activities, sleepovers, field trips and/or camping trips. All of these can start or end earlier or later than Campus Days. Detailed sample schedules can be found in Appendix A.

WHERE?

JHC is held at The LearningWorks Three Rooms campus, at Beit Sefer ORT Pelech, on Dov Yosef street in Jerusalem. We also have activities at TLW's HackerSpace in Arnona.

Three Rooms Campus, ORT Pelech School



Both maps
are hyperlinked to
Google Maps.

left-click to use.

Jerusalem HackerSpace, Arnona



WHO ARE OUR TEACHERS?

Our Head Teacher and Founder is **Shaiel Yitzchak**. He has degrees in Engineering, CS, Education and the Humanities. He teaches Robotics at The Hebrew University and has teaching certification in the State of Israel.

Shaiel has 24 years of experience in formal and informal education, and 14 years in high-tech, in Israel and in the US.

Shaiel is fascinated by group dynamics, teamwork and motivation. His specialties are:

- Motivating students to break through their own barriers
- Encouraging students to raise their level of inquiry

And kids seem to have a bit of fun around him, despite his sense of humor... .



Ariel Hershler joined The LearningWorks in 2014. He holds an engineering degree and is a certified teacher. He has 28 years of experience in formal and informal education as well as 28 years of experience in the high-tech industry, including 3 successful "exits".

Ariel is deeply moved by the child's ability to cross barriers, to adapt and to do the impossible.

But more important than all this is that students truly enjoy being in his company no matter what they're doing.

TLW hires some of **the most amazing staff** that can be found. Anywhere. We are proud of our (very) high staff-student ratio. When possible, we hire from within, and we believe strongly in our interns who have usually been our students for years.

Communication and encouragement are prime considerations in who we accept as LearningWorks staff.



WHO ARE OUR STUDENTS?



We primarily work with ages 8-16, though we have made a few exceptions.

We select the makeup of each learning group very carefully. Applicants are interviewed. The fact that you're reading this means your child and The HackerCamp are probably well-matched, but it's important to us (and to you!) to be sure.

We look for students who wish to be engaged in their own learning process.

Age and background are less important to us than a student's drive to learn, their fascinations and that they enjoy learning.

It's helpful if your child is technologically and/or scientifically inclined – but if they're curious, we can take care of the rest.



Language

Our students speak Hebrew and English, and so do our staff. When parents ask 'Is this an English camp or a Hebrew camp?' we answer, 'Yes.' It depends who's working with whom. Field trips are often in Hebrew, and when the guide can't translate to English, students help each other, translating for non-Hebrew speakers.

WHAT DO WE DO?



The LearningWorks Mission:

- 1) To transition our students' through the roles of 'passenger' into 'pilot' in their education.
- 2) To engage our students full-minds – creatively AND analytically, thoughtfully AND emotionally – together in symphony.
- 3) To teach the GROWTH and not the FIXED mindset.
- 4) Every kid is the best kid ever. We will help them believe it.
- 5) We prepare our students for lives of engaged excellence.



WHAT DO WE DO? cont.

Curriculum

Kids are natural engineers. We really like our students to learn by making things.

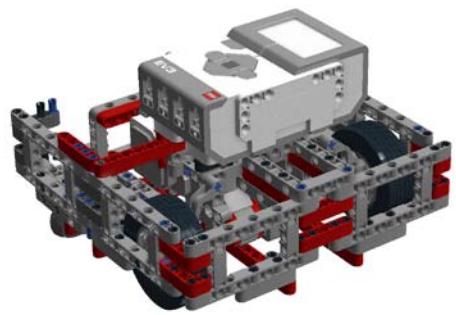
We teach several levels of engineering and construction, from pillars and 'brick' supporting walls to suspension bridges and large buildings. We build a wide range of mechanical models - from simple machines (levers, inclined planes) to wheeled and treaded vehicles on tracks and off.

We have one of the best robotics labs in Israel, including 940,000 LEGO elements. Our students can create a city in which 56 robots operate 24 trains and vehicles



simultaneously on roads and tracks (up to 600m of track!) they design themselves.

The HackerCamp uses Lego's NXT and EV3 platforms, and we use Arduino, Raspberry Pi, Hummingboard, CuBox and Edison robots (which we, TLW, helped fund on [Kickstarter](#) last summer!). HackerCamp Students for terms of 4 weeks and longer receive a Raspberry Pi. **Kids**, click [here](#). **Parents**, click [here](#).



Research and Communication

Creativity is the start, not the end of innovation. But in 2016 we want our students applying their creativity to real-world solutions. This requires a deep understanding of things, so teaching effective research skills is a very high priority to us.¹ Our students often learn presentation design and delivery, and we usually end the day with someone's amazing research presentation.

Cutting edge and Old School, as partners

We are fans of both the cutting edge of educational tech, and of old-school nuts-and-bolts science tools. Both are great for teaching skills our students will need in the future. But as exciting as all this is... they are only the vehicles for our real work. Our main goals are to:

- teach creativity and analysis not exclusively of each other but INTERDEPENDENTLY - each strengthening the other.
- prove that our intelligence is not set or predetermined, but is fluid and dependent on how often and how well we use it.
- teach students how to make a safe environment for themselves, how to make space for each other, how to communicate and collaborate effectively.
- teach our students to be the drivers in their educational process instead of passengers - and teach them HOW to do this.

¹ For the second year in a row, our First Lego League team took first place in "Research and Innovation" at the regional tournament!

Learning Groups

Age is one of many considerations when we design groups, and we do not group students by age. Your nine year-old may work on a team of fourteen year-olds, who agree that the wheel base of their current design will work best with thin tires of large diameter. Similarly, you may find your fifteen year-old working with someone younger, who has some social intelligence your child would benefit from being around. Many parents have shared with us that the space our students make for each other is a critical part of the special and unique culture at The HackerCamp.



Google and MakerCamp

The HackerCamp is part of Google's Maker Camp Consortium. In this context we recycle old tech into new computers and we make junk into science projects. We use hand and power tools for woodworking and metal work projects, and do CAD modeling and 3-Dimensional printing.

We also analyse cells and proteins under our microscopes, and we track the ISS across the sky at 3am. We have used lasers to measure the speed of light through gelatine and built a TARDIS from a large refrigerator carton.



Some things we've made

Our students have made an app guiding us to the nearest bomb shelter in Jerusalem. (App-creation was fairly new during the war two summers ago.) We combined TicTacToe with quantum physics so the game more closely resembles Chess.



We've created Minecraft mods, hacks, Minecraft servers, an app that helps prevent bullying, a particle accelerator made of LEGO and a reading aid for Dyslexics in Google Android.² We have created a species of mushroom which causes plastic bags to biodegrade.

We've made our own Jellybeans,³ which we later put into a Lego-TARDIS-candy dispenser. Which we also made.



Guest Speakers

Different voices speak to each of us, so each week we have one or two guest speakers. We choose them for their innovation, vision, inspiration or overall educational potential.

Past speakers have included:

Yosef Abramowitz, Energiya Global

Dan Saat, Spacell

Shai Agassi, Better Place

MK Dov Lipman, Israel Knesset

Zoe Bermant, KiddyUp

Yishai Cohen, Smartbus

Field Trips, etc.

We're going to be honest. Our field trips are amazing. We've been to Teva's logistical plant, 3D printing factories, the testing environment at Intel Jerusalem; we have been to a refrigeration system plant, the printer and toner factory of HP Indigo, we've met with heads of Search and Rescue from the army, and we've been to an assembly line of unmanned helicopters and UAVs. And we've been to the construction site of a hospital's underground parking garage which can become a bomb-proof, 1,200-bed hospital with 24 hour's notice. And we've been to Hebrew University's server farm, and to Google Tel Aviv.

When possible we offer a cycling option. We also go camping several times per summer. Family is typically invited at cost (and you should ask those guests how awesome our trips have been!)

And we'll probably have a few sleepovers also.

And board game nights. Oh, and astronomy labs, and movie nights. And barbeques. . .

² Based on a response from over 7,000 testers, *HexaDyslexia*, our reading aid, helps 68% of Dyslexics read. Google incorporated it in ChromiumOS and it is available (for free) [in the Google App Store](#).

³ We are not above making a big mess in the name of education. Or fun. In fact we'll make loads of messes again this summer. But we are never making jellybeans again. Ever.

Costs for you to consider

Tuition

Full-term Tuition: 6100 sheqel

Weekly Tuition: 1350 sheqel

3 weeks: 3300 sheqel

4 weeks: 4000 sheqel

5 weeks: 4850 sheqel

6 weeks: 5700 sheqel

Supply Fee

Supply fee is 100 + (weeks x 50) sheqel.⁴

This must be paid separately from tuition.

Lunch and Snack Costs

The HackerCamp does not provide lunch or snacks. (Okay sometimes we provide snacks, but for practical purposes assume we don't.)

Bicycle costs

If your child is a cyclist, they should take advantage of the many cycling options to field trips and/or early-morning bike rides we offer throughout the summer. You should consider the maintenance of your child's bicycle when making your calculations. Also, HackerCamp requires a helmet, a spare inner tube, a lock, a water bottle and a way to carry it (can be a backpack).

CONTACT INFO

This document answers the questions most parents have asked us over the years. We hope it's been helpful to you. If you're interested, the next step is to fill out our application, and then to schedule an interview. The application can be downloaded [by clicking here](#)⁵. Full instructions are included in the application, and we will be in touch to schedule an interview.

If you have questions that can't wait you can email us at info@thelearningworks.org. And our phone numbers are 058-334-9024(from Israel), 213-221-6119 (from the US) and 0207-048-2170 (from the UK). Please consider the time difference – we are GMT+2.

APPENDICES

The next few pages are schedules from previous years, and activities we have done on various topics. (We are especially proud of the very last one - on Gender Bias. It may look boring compared to others (did you notice one of our FLL teams created a new species?) but it was one of our best activities ever.) We hope you find this information useful!

⁴ Supply fee for 4 weeks = 100+200 sheqel, 7 weeks = 100+350 sheqel

⁵ This is a Dropbox link. You do NOT need to install Dropbox to download the document through their app. (Though Dropbox is a great app.)



Sample weekly schedule from The HackerCamp 2013

| | Sunday | Monday | Tuesday | Wednesday | Thursday |
|-------|---|---|---|--|--|
| 07:15 | | Early morning bike ride - Borekas on Haas Promenade. | | Field trip to Dimona and Ashkelon - Leave early! | |
| 09:30 | Good morning Brain Workout | Good morning Brain Workout | | | Good morning Brain Workout |
| 10:00 | Project assignments, brain storming, kick off Lesson: Measurements of electricity | Project Lesson: How do we store energy? | Camp starts at 10:00 Exercise: How many Watts, Amps and Volts does my family use? | Tour of Bright Source Solar Energy Farm | Equipment test for camping trip. Set up, check, repair (if needed), breakdown and repack. Leave equipment over weekend for next week's camping trip. |
| 11:30 | | | | | |
| 12:30 | Lunch | Lunch and video: <u>Anholt offshore wind farm in Denmark</u> Project evaluation and adaptation | Lunch | Packed, picnic lunch | Lunch and Video: <u>The Boston Big Dig</u> |
| 13:30 | Project | | Discussion: Power and Sustainability | Tour of Ashkelon power station | Discussion: <u>Environmental footprints</u> |
| 14:15 | Clean up and repack room/lab Dismissal | Clean up and repack room/lab Dismissal | Clean up and repack room/lab Dismissal | | Clean up and repack room/lab Dismissal |
| 14:30 | | | | | |
| 17:30 | | Please take a short nap at home!! | | Home at ~17:30 - Dismissal | |
| 18:30 | | | | | TKP Family BBQ at home of family in neighborhood. |
| 19:30 | | Rooftop movie night - E. T. | | | |
| 20:00 | | | | | |
| 21:30 | | Astronomy Lab - Crater shadows on FULL MOON! | | | Clean up |
| 23:00 | | Clean up | | | |

| |
|-----------------------------|
| Early Morning |
| Campus Hours |
| Evening/Night time Activity |

HackerCamp 2014, Weekly Schedule – SUBJECT TO CHANGE

| Week 3 | Sunday July 13th | Monday July 14th | Tuesday July 15th | Wednesday July 16th | Thursday July 17th |
|---------------|--|--|--|---|--|
| | | Please bring tents, bedrolls, for equipment check | Bike to Tahana Rishona, leave at 08:00 Bring breakfast | Arrival 08:00 Camping Trip! | |
| 09:00 | Arrival | GanglySister.net, Purple and Nine, Women in Technology | Arrival | | |
| 09:30 | Brainteaser | Brainteaser | Brainteaser | Busride to Tel Aviv | |
| 10:00 | Morning Presentation | | | | |
| 10:20 | Snack | Snack | Snack | | |
| 10:40 | Awesomeness | Awesomeness | Awesomeness LEARN: Google, borders, mission statement? “Can Google Translate do sign language?” | 11:00 Google Israel Meet Avi Rosenschein, Information Scientist | |
| 12:30 | Lunch | Lunch | Lunch | | Break camp after lunch |
| 13:00 | Coolness | Coolness Tent Checks | Coolness | Busride to Ashkelon | Busride to Rehovot |
| 14:20 | Synthesis | Synthesis | Synthesis | Check in at campsite | 14:30 – Visit fabrication plant of Morel Industries |
| 14:45 | Clean up | Clean up | Clean up | Pitch campsite | |
| 15:00 | Dismissal | Dismissal | Dismissal | Prepare supper | Busride home |
| | | Astronomy night from 19:30-21:30 Google Maker Camp event until 22:00 | | | Arrive at TLW by 17:00 Unpack bus into camp Dismissal at 17:30 |

21st July, 2023

To: The LearningWorks, Jerusalem
From: Land Allocation Authority, Urban Planning Division

Dear HackerCamp Students,

We have preliminarily decided to grant your request to build an experimental city. We will grant you a land area of about 3x7 kilometers. Before making our final decision, We would like to see a scale model of your proposed city on a scale of 1000:1, or, a scale model of 3x7 meters.

The land is mountainous, which has been mostly flattened – but there are several valleys of about 500 meters each. You will need to use local lumber to construct bridges to support the static load of the bridge itself, and the dynamic load of any traffic crossing the bridge. The chasms are extremely high, so pillars are not possible, and as the region is windy, you may not use suspension bridges.

We would like to see solutions to the following problems:

- 1) Residential areas should be separate from industrial and commercial areas – separated by the above-noted chasms, if possible.
- 2) You must, nonetheless, connect residential and commercial/industrial areas with a robust and effective rail and road system, with several different working trains. The railway system must be free of accidents, and must be completely level – so
 - a. you must find a way to make sure the elevation of each section of train track and road is equal.
 - b. You should also explore whether you can use the rPi systems to integrate a traffic-control center, closing roads to rail traffic, and rail traffic to road activity.
- 3) Your city's commerce will expand more powerfully if you can receive air traffic.
- 4) Your city's residential, commercial and industrial zones must be under the protection of one or two Iron Dome batteries. These can be built onto the base of mobile cranes already accessible to you (LEGO kits 42009 – build only the base, then improvise).
- 5) A sub-orbital spaceport will make your city a popular destination for the space-tourism industry. We recommend searching for a solution, but we consider this a bonus.
- 6) You should catalog your work with time-lapse photography using the rPi we built last week.

Solutions to other problems you find will only help your cause – the more creative, and the more collaborative, the better. i.e. One team's solution solving two problems, or similar.

Teams may have three or four members, including one staff member on each team. Each team must have a spokesperson (not the staff member), who will sit on urban board-meetings from time to time.

In the board meeting, the spokesperson must explain their team's progress to the board, suggest how to integrate it with the work of other teams, and report back to their team.

Scale-model assembly must be completed by the board of reviewers meeting on Thursday, July the 24th, at 13:00. We look forward to reviewing your progress.

S.T.E.M. Workshop 2013

the logic train

Greetings Engineers.

Main Goal:

- To learn about logical relationships using two moving trains on several versions of tracks we will lay out ourselves
- To learn about the physics involved in acceleration, momentum and balance.
- .
- which can cause trains to derail

Requirements:

Create a single, cyclical track which will enable two three-car trains (engine plus three cars) to travel at the same time, in the same direction, with no derailments

Create a track which will allow two trains to travel in opposite directions.
Two switches are allowed.

Create a track which will allow two trains to travel in opposite directions.

If we use four switches (instead of two) what changes does this enable us to do?

Mission:

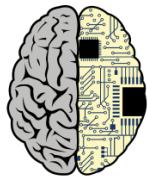
Fulfill all of the above requirements. That means some people need to work on trains, some need to work on tracks, some need to work on power supplies. . .

The TKP management group will be paid in local currency, and the people here trade in cookies. But for the TKP group to get paid, everyone needs to work at least some on every part of the project. If this requirement is not fulfilled even by one person, no one will get paid.

Bonus mission:

Assuming a flat and continuous surface for the laying of track. . . List the minimum supplies required to put three trains on a cyclical track, let two move in one direction and let the third train move opposite, and have no collisions and no derailments.

GOOD LUCK ENGINEERS.



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Shuk quest 2014

The shuk (market) at Mahane Yehuda is one of the most unique places in Israel. Overlapping cultures, each stall-owner trying to sell a generations-old recipe for a local type of food... 20-shekel jeans...

Our meeting place is in front of the uncovered section, which is Rehov Mahane Yehuda. It's right between what's, on this map, listed as the Iraqi Market and Georgian Markets, on Yafo (Jaffa) Street.

Teams of 2 or 3, with one staff per team. Check in with Shaiel before starting your quest.

At 12:15 we will meet for lunch at the fish and chips shop, by the grill shop, which is next to item 3. (It's in the bottom right corner of this map.) You don't need to buy lunch if you brought it.



The day will end at 14:15 when students will be released at the same place. Cyclists will then ride back to TLW. It's okay for students to ride home instead of back to Baka. Cyclists riding back to TLW will arrive by 15:00.



March 5th, 2016
Stanford University Mycology Laboratories

To: The Schrodinger Research Team,
The LearningWorks, Jerusalem

Dear Team Schrodinger,

I'm happy to report to you that your idea seems to work. The 10 anastomosis specimens crossing between your *P. clypeata*-*J. semitosta* hybrid from Amsterdam, and our *Urnula U. Craterium* species have been growing in the sterile plastic substrate for thirty-two days now. This is what we consider the threshold for viability.

The slower it grows, the stronger the end result. But, remember that we are not only looking for strong mycelium, but also flexible. This increases the product spectrum we are able to offer as industrial solutions.

We have set three intern-researchers from Stanford trying to ascertain what stunted the growth of specimens 1022, 1053 and 1102. (Their close grouping suggests a toxin may have been introduced, but so far the digging has turned up negative and the remainder of these tests take time.) We agree with you that this information could be valuable and could help us in terms of flexibility. Time will tell.

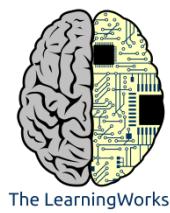
And yes, we can discuss naming the new species. Dr. Wosten's team also has a say in this matter but they have indicated that they are amenable.

These names have traditionally been Latin child-names. Do any of you speak Latin?

What did you have in mind?

Dr. Phillip Ross, MycoWorks

(This letter was received by one of our FLL teams regarding their work in 2015-2016. The team was allowed to name the species of fungi they created, which biodegrades plastic bags and replaces plastic in some industrial applications.)



GENDER BIAS IN SCIENCE

Who are Purple and Nine?

What do you think of the GoldieBlox ad campaign?

<https://www.youtube.com/watch?v=y-AtZfNU3zw>

<https://www.youtube.com/watch?v=ZVCC83cDch0>

What does it mean that these toys are marketed (meant to be bought by/for) girls?

Would you classify the color schemes for LEGO's NXT and EV3 robot systems as masculine or feminine colors?

Find LEGO's address where they receive emails about their products. Have Reuven or Shaiel create an address for you using the 'thelearningworks.org' domain. (i.e. if your name is Noam, have them create an email called 'noam@thelearningworks.org'.) Have it forward all email to your personal email account.

Write an engaging and honest letter to LEGO corporation telling them what you're doing with your summer, what interests you, probably that you care about gender bias in your educational toys, etc.

Tell them you'd like a pink robot. Make sure you explain you are NOT interested in buying 40,000 units (or even 40) but one or two pink robots. How much would they charge you for that?

LEGO will probably not make you a pink NXT. But before getting in touch – Try to make a good prediction on how you think a company like LEGO will respond.

Watch Purple and Nine again.

What questions do you have for the creators of P&N?

What advice do you have for them?

What do you hope they concentrate on, if they get to make their series?

Do you think P&N and GoldieBlox should team up? Why or why not?

If you have been reading this in the Jerusalem HackerCamp Guide 2016, and you made it this far, THAT'S A WHOPPING 15 PAGES OF READING! WAY TO GO! Please mention "Shakalaka Boom Boom" during your interview for a 100 sheqel discount. And, maybe, an ice cream. . .