



## The LEGO® Boost Experience

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Images by Jetro de Château and LEGO® System A/S

**Set:** Creative Toolbox  
**Set Number:** 17101  
**Parts:** 847

Opening a long-expected LEGO® set is always an experience, but this set is somewhat different. First, I have made sure to have an assistant: only a seven-year-old will do to see if this set really lives up to its expectations. In addition, this is not just a LEGO® set, but a robotics kit (although LEGO® never uses that word when advertising the set) which has me just about as excited as my helper.



The box for this set has a peculiar format – it feels very long – and is full of information about the set. The front of the box indicates we need a tablet (required but not included), as well as batteries (6x AAA), and the back of the box includes a link to a LEGO® webpage where you can check the compatibility of your tablet. Both sides also prominently feature the five models you can build with the set. Interestingly the front shows off Vernie the robot plus all five models in cartoon format, while the back has Franky the cat as the large main model along with photographs of the other four models.

The box contains 11 numbered bags and one bag with some large wheels, long Technic bricks, a motor and a sensor. There is also a white box that contains the hub. There is a cool poster of Vernie, with all the mandatory safety information as well as instructions on how to insert the batteries and reset the hub. Finally, there is a cardboard playing mat with some additional product information on the back, including the bill of materials. The mat also instructs you to find the app using the keywords LEGO® Boost, but I did not find any QR code to take me straight to the download page.



The app requires quite a bit of memory and processor power. The link [LEGO®.com/DeviceCheck](https://www.lego.com/DeviceCheck) takes you to a page that explains the minimum requirements for iOS and Android devices. Unfortunately, the list of Android devices LEGO® have checked themselves is quite short and you are better off visiting the LEGO® Boost Community on Facebook where you can find an extended list of devices confirmed by users. Also, although LEGO® plays it safe and lists Bluetooth 4.1 as a minimum requirement, I have found that many devices with Bluetooth 4.0 also work, provided they are BLE enabled [1]. An 8" screen is also not a hard requirement (several users have reported being able to install on 7" devices), but using the app on a smaller screen becomes uncomfortable.



## First steps

With the app installed and the numbered bags in front of us, we set out to start building. The big question is what exactly will we build? When you open the app, it points very decidedly at a very minimalistic model – just the hub and a pair of wheels – that you can build with the parts in bag number 1. It is a very satisfying experience because you immediately get to use the app to make that base move and try out some code sequences. The two little robots you build with a couple of bricks each serve as target practice and we had some good fun programming with just a handful of pieces.



Result of building bag number 1



Vernie

A note to the uninitiated: BLE works different from Bluetooth in that you do not establish the connection in the Bluetooth configuration section of your device, but rather in the app itself. If you try to connect to the hub in the configuration section of your device you are likely to run into some issues, so simply turn on your Bluetooth and start using the app.

## Vernie

The numbered bags have been designed to build Vernie as the next step. My seven-year-old thought Frankie the cat was much cuter, but she conceded that it made sense to first build Vernie because the bags were numbered – talk about pragmatism.

First you build Vernie's torso and head. Then it's time for some quick programming. The expressions on Vernie's face are good fun and things get even better when he starts to speak and asks you to program his head so he can move it. Vernie tries to use his tracks, only to realise they haven't been built yet, so then it is on to building again. The setup is fun and keeps a nice balance between serious building and lightweight programming.

## Programming

The programming interface uses two kinds of blocks. While building the 'Hero models' there are numerous combined action blocks, specifically designed for a specific model. In the case of Vernie, for instance, there are blocks specifically for moving his head one way or another. As you progress through the building stages you discover new blocks, and those get added to your treasure chest so you can reuse them later on. The advantage of this is that kids are not presented with too many options right from the start, and instead learn what the blocks do little by little. If you don't have the patience to collect all the blocks or simply want to get into some more serious programming you can always go to a special area of the home screen. To the far right there is a vortex, hidden by a curtain. If you go in there you get access to all the small blocks that make up the larger actions that the Hero models use. This is also the programming area you need to use to follow the Boost Programming tutorial in this issue of HispaBrick Magazine.

The app with the instructions and programming interface has only been released for Android and iOS, although LEGO® has announced they are developing this for new platforms and will release a version for Kindle devices in late September. LEGO® has learned an important lesson from the WeDo 2.0 release which launched on numerous different platforms and had some serious trouble at the start. Personally, I would like to see versions for Chromebook, Windows 10 and Mac, but it is unclear whether that will happen. In the meantime, and before LEGO® has even announced the release of an SDK[2], Jorge Pereira has reverse engineered much of the Boost protocol and made it available on GitHub [3]. Picaxe has also released a helper app that allows you to program Boost with Scratch [4].

## Battery Life

When you start using Boost, you will soon realise the batteries run out relatively quickly. AAA batteries are not particularly high capacity, and it may be worth your while to invest in decent rechargeable batteries. Philippe 'Philo' Hurbain did some tests around power consumption and found that once the hub is linked to the app, consumption is at 70mA. However, after a program has been launched it doubles to 140mA and stays like that unless the hub is powered down. That means when using standard 1000mAH batteries you have around 7 hours of idle life – without any programs running! That's not very good and hopefully this can be optimised in future firmware updates. We only got halfway through Vernie before the app started informing us the batteries were running low. An official rechargeable LiPo battery would be the perfect solution, but since Boost is not a LEGO® Education product I very much doubt they will ever produce one.

## 5 in 1

The official name of the Boost set is "Creative Toolbox". It contains no less than five complete models. While Vernie is the star of the show, there are no obvious 'secondary' models. Frankie the cat has a lot of personality and an important cuteness factor. The Auto Builder is a robot that builds robots and MTR4 is a bulldozer with different attachments.

My only disappointment was the Guitar 4000. The model is solid and the functions are cool. It makes sounds, and pretty cool ones at that, but you simply cannot make music with it. Much of this is due to the inevitable lag in BLE communications. Because the program runs on the tablet it takes a few milliseconds for the sensor information to be sent from the model to the tablet and processed, and for the appropriate instructions to be sent back. In any of the other models that's no big deal and goes virtually unnoticed, but in music timing is everything.

Once you are done building the Hero models, you can move on to creating your own models. This is where the name "creative toolbox" really applies. Not only do you have the parts and the electronics to create your own robot, the app also provides instructions for a wheeled base and a walking base. This means that rather than figuring out the complicated mechanics of such a base, you are provided with a starting point for your own designs.

If I can keep up the supply of batteries the set is sure to be an absolute success at home, and I look forward to seeing what models AFOLs come up with for this set.

[1] You can use a BLE Checker app from the Play store to confirm if your tablet has BLE

[2] Software Development Kit

[3] <https://github.com/JorgePe/BOOSTreveng>

[4] <http://www.picaxe.com/LEGO@-Boost/>



Different screenshots of the App