



# LEGO® WeDo (II)

## Programming

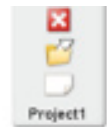
By Edwar Romero  
Images by Osvaldo Romero

LEGO® is a universe in itself; we can build our own worlds. We know it for sure; we see it in every issue of HispaBrick Magazine®. In addition to being able to build our dreams, the LEGO WeDo platform allows us to program our creations to move as we command from the computer.

Do you want to conquer the world with LEGO creations? Me too, we will do it step by step, but remember the programming will make a huge difference. The software that is available for

programming it is extremely intuitive to use. The image below shows the working environment.

While playing with it you can discover how most of the functions work without requiring a computer engineering degree. You don't need to write a single line of code, using drag and drop is all you ever need. For example, if you want the motor to start rotating, you can place the motor icon next to the play or start button (the green triangle) on the white





canvas. Hey, all those years listening to music comes in handy once in a while, right? To stop the motion, just click on the red button or hit Escape on the keyboard. If you want more specifics on this, you can check the previous HispaBrick Magazine® where Diego Galvez described this in detail.

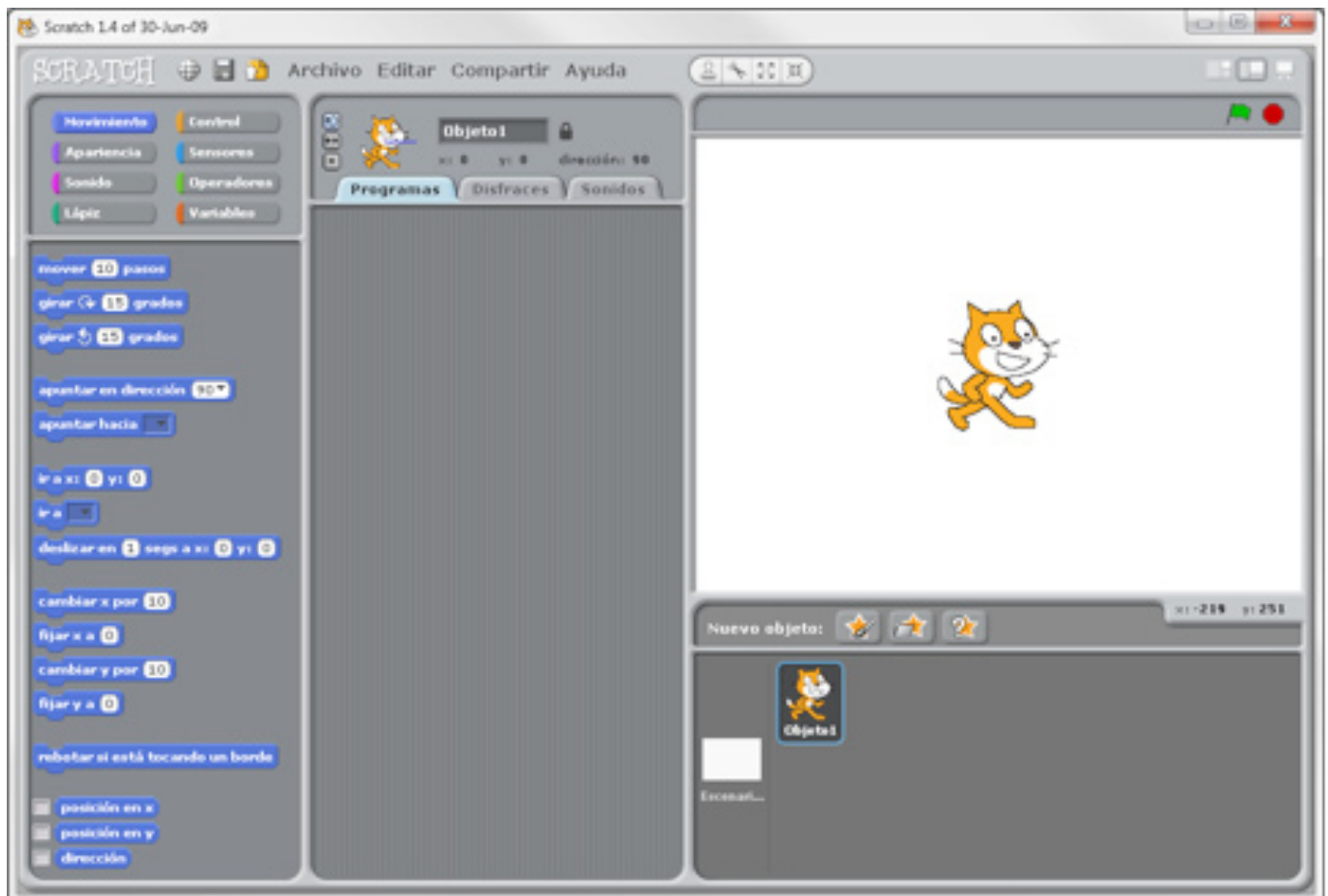
The main advantage of the WeDo software is that no previous knowledge is required beforehand. This software is designed to learn computer programming as intuitively as possible. However, this software is sold separately.

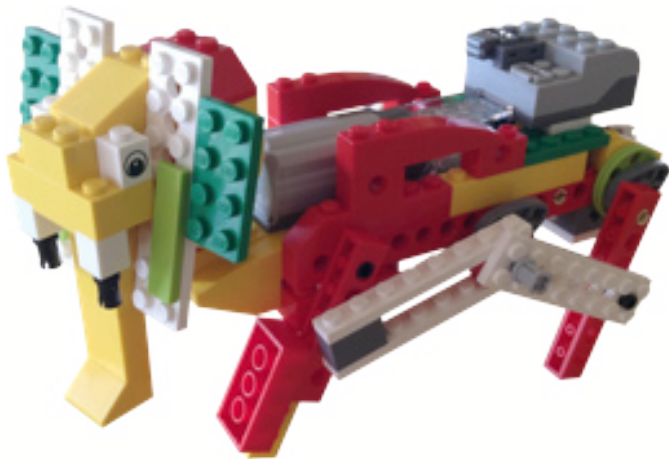
The good news is that there is no need to use this software to program the WeDo robotic set. Here open source software comes to the rescue. This time it originates from the Massachusetts Institute of Technology, better known as MIT. They developed Scratch as an educational programming language. This software allows programming the LEGO® WeDo set and many other new unthinkable things.

The 1.4 version is the latest one compatible with the WeDo platform. The latest available version is the 2.0. This one works in a web browser (no need to install anything, but it an Internet connection). However, it is not yet compatible with WeDo. The 1.4 version is hidden on the web, but you can find it at [http://scratch.mit.edu/scratch\\_1.4/](http://scratch.mit.edu/scratch_1.4/). It is available for Windows, Linux and even OS X.

In the image below you can see a screenshot of this platform. It looks a bit confusing the first time when compared to the WeDo software. Remember, it will allow you to do develop more code than ever.

It also works using drag and drop. The main difference is that in the WeDo software the programming blocks are connected horizontally, while on Scratch they are connected vertically in the central panel. In addition to controlling the motor and sensors, you can control the image on the canvas with the sensors. You can see it allows for many more options.





In Scratch you have the programming commands in the left menu. The central window is where you code your programs, while the top right is where you can see your creation interacting, really cool, don't you think? This white canvas area allows having programmable objects in it, called sprites.

Not every command is required to control the LEGO® WeDo set. We need to find the commands for the sensors (under the Sensing menu, the last options are for tilt and distance), and the commands to control the motor (under Motion at the bottom, but they only appear if you have the USB hub and motor connected).

The image below shows the differences between the WeDo software and Scratch for a code that makes the motor turn.



If you want to know more about Scratch, there are hundreds of resources on the Internet. The best way to know what you can do with it is seeing it in action. Here you can check a few videos about it [http://info.scratch.mit.edu/Video\\_Tutorials](http://info.scratch.mit.edu/Video_Tutorials).

You can visit the MIT website about Scratch and WeDo at <http://info.scratch.mit.edu/WeDo>. You will find videos of what is possible with this programming language and the WeDo platform. You will be amazed by the things you can do, the projects, ideas and challenges. Boston Public Schools also host a neat PDF tutorial that can be downloaded at <http://bit.ly/19VxnFp>.

If for whatever reason you didn't have the chance to obtain the WeDo software, now you can use Scratch to program your creations. The WeDo software has instructions for assembly and programming of 12 robotic designs. So, you can unleash your creativity.

If you don't have access to the WeDo programming instructions, Barbara Ericson (a researcher from Georgia Institute of Technology) developed educational material for the WeDo set using Scratch. This material covers 8 of the 12 robotic models. The tutorial can be downloaded as a PDF file from Georgia Tech at <http://b.gatech.edu/r7pB1z>. So, no more excuses to start programming.

Like everything related to LEGO, the sky is the limit. But now we can go even further with programming.

You can find more information, and building and programming instructions for the designs presented here and many more at: [www.wedobots.com](http://www.wedobots.com)  
[www.facebook.com/wedorobots](https://www.facebook.com/wedorobots)

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