LEGO® WeDo (V)

*Programming in Scratch**

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Cover image by Osvaldo Romero

We continue here with our plan to dominate the world! One LEGO® brick at a time. The best part is that we can start doing it with programmable WeDo™ bricks the best we can. We continue here our programming quest in Scratch as the software for our battles. In previous issues of this magazine, we have covered the WeDo software basics and the equivalent commands used in the open platform Scratch.

We have talked before about how to program a few basic things, like the fundamentals for the motor and the different alternatives to turn it on and off. Last time we started talking about different options for programming the Amazing Mechanisms included with the WeDo software: Dancing Birds, the Smart Spinner and the Drumming Monkey, and how to do it using Scratch. This time we continue with the next set of 3 mechanisms: the Hungry Alligator, the Roaring Lion and the Flapping Bird (designs 4, 5 and 6 from the figure below).

button, and look around for a suitable sound. I used the one called Slurp in the Human folder. You may choose a different one, download it from the Internet or even record your own version. Don't forget to choose the sound from the drop down menu, otherwise your alligator will sound like a kitten. Once done, you need to select the motor direction in the opposite way to see the jaws closing for chomping down whatever the fangs caught.

We can start thinking about having our own robotic security system using LEGO® bricks. What if you have a wolf or huge bear as a guardian for your home, built completely with LEGO and programmed to behave as you like? It seems like world domination is one step closer!

Let's start with the Hungry Alligator. The WeDo software program begins when hitting the letter "A" on the keyboard to turn the motor one way to open the powerful jaws of this alligator. After that, it will make a scary bite sound and immediately turn the motor the other way to close the jaws and bite everything that gets close enough. It will chomp for a few seconds before the next bite. The next image shows this sequence programmed in WeDo.
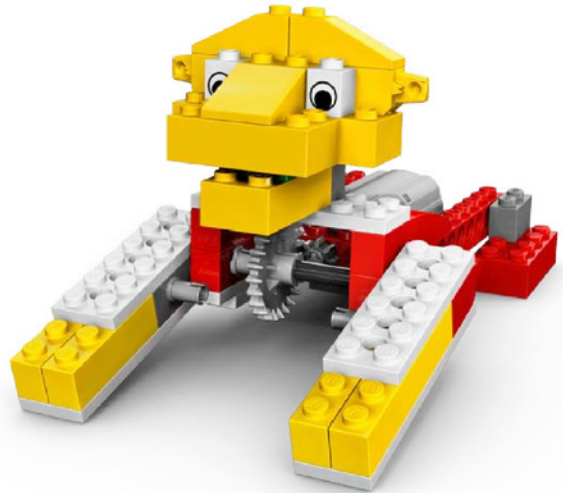

You can program it in Scratch in a similar fashion. You need to look for the Control tab to find the "when __ key pressed" and selected a letter on the drop down menu. The letter "a" was selected for this example.

You can select the space bar since you don't have to look at the keyboard constantly to find it. You need to use the "motor direction" to open the alligator jaws, after that the option "motor on for" 1 second under the Motion menu. Next, you need to select the option "play sound". By default the meow sound appears, you may want to change it since it doesn't sound ferocious enough for a hungry alligator. So, you need to import a new sound for this task. You need to go to the zone where you are programming, look for the Sounds tab, hit the Import

Next is the Roaring Lion design. The programming in WeDo is as shown below. One key is used to get it up and roaring and another to send it to sleep. When the big cat is up and roaring like a fierce beast, you need to configure the power level of the motor and check the motor is turning the right way. Don't forget to add a ferocious sound for this feline.

When our big cat is tired of roaring, it needs to go for a good night's sleep. For that, you need to program the motor power and check if the motor is turning in the right direction for the lion to go to rest. You also need to find a sleepy sound to show this cat is quite friendly when it is tired, so we can get close without getting into trouble.

Performing the programming in Scratch shouldn't be difficult for this task after all we have learned with the previous design. You need to verify and test several motor power levels for the lion to behave like the king of the jungle it is. We don't want our robotic friend to fall apart while performing, do we? The most difficult part for the Roaring Lion programming is finding a hungry lion sound. You can try your best impersonation to record this sound. You can be the voice of your own creation! You can also resort to a sound file of your liking from the Internet if the ones in Scratch are not fierce enough.

For going to sleep, our feline friend can be programmed in Scratch as shown below. You need to be really creative when choosing a sleeping sound. You can try between the ones available in the Scratch folder to see if there is something you like or you can try to record the best impersonation you can for this sleepy cat.


In order to complete the three designs from the Wild Animals set, we still need to work with the Flapping Bird. The Flapping Bird is a lot less complicated than previous designs. It only uses the tilt sensor to activate the wing flapping sound.

The basic WeDo program should look like the image below. We have a loop that allows the cycle to repeat as many times as needed. There is also the wait command connected with the tilt sensor. The tilt sensor is on the horizontal position (no tilt), so when is moved to another position it will activate the wind flapping sound for this huge bird. You can imagine this bird moving its powerful wings through the air. Is quite terrorific, isn't it?

Working in Scratch, the program should look similar to the one found below. The "forever if" loop can be found under the Control menu. If you look under the Operators menu, you'll find the equal to block "_=_". You can play with the value to find other interesting configurations. Going through the Sensing menu, close to the end you'll find the "sensor value" block. On that drop down menu, you will discover the tilt sensor like the one on the image.
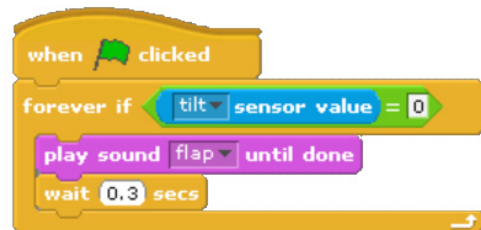
Finding the right sound for the flapping of the wings for our big bird is a complete challenge for this creation too. You can try and record the sound effects for this design as well. You can also search on the Internet for the sound of your preference.

That's all for now folks, stay tuned for the advanced programming of these creations in the next issues of HispaBrick Magazine®.

You can find more information, and building and programming instructions for the designs presented here and many more at:

www.wedobots.com
www.facebook.com/wedorobots

* This tutorial uses Scratch version 1.4 - The use of LEGO® WeDo in Scratch 2.0 is still experimental.
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