



Educational Robotics



Content

- ❖ Introduction
- ❖ Children 5 years +
- ❖ Children 8 years +
- ❖ Robotics

Who is it for?



The activities are designed for the following age ranges :

- From 5 to 8 years
- From 8 to 12 years
- Over 12 years

Why?

- Programming is the new literacy, is the new ability of the XXI Century
- Today all depend on the technology to communicate and work
- Our children are digital natives, know how to use the phones, tablets etc. better than their parents and grandparents but know someday build?

How?

The new system of robots allow our children to the first simple instructions and handle the robots from 5 years playing.

Opens the mind, explore and promote creativity and problem solving.



Methodology

In our classes children will face different challenges that have to be solved in a sequential manner according to their age, having fun at all times.

The difficulty will be increased according to the skills achieved by each student.



Overall objectives

- Learning to Think
- Encouraging creativity
- Promote teamwork
- Learning to solve problems
- Increasing confidence



Group 5+ years

- ❖ Skills that work
- ❖ Means used
- ❖ Examples of activities

Skills

- Controlling the robot and the world around them
- Driving, disguise, music, sounds, imagine and realize anything you can imagine with the robot.
- Encourage creativity and imagination lead to real life.
- Using math to add, subtract, etc. counting geometry.
- Basic design of sequential algorithms
- analytical thinking
- Programming

Group 5+ years

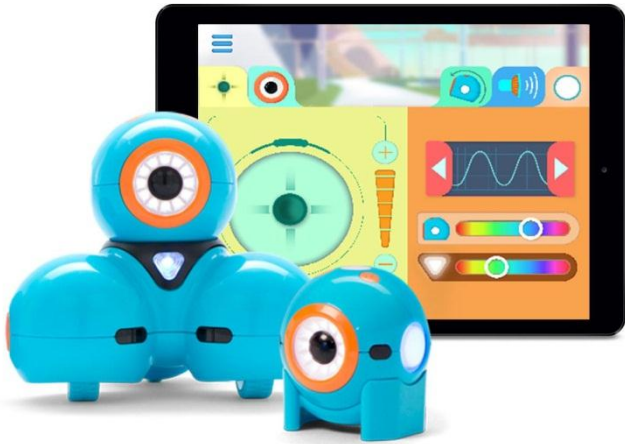
Resources neededs

- We use two robots, Dash & dot
- We use a Ipad Tablet or Android.
- We use LEGO
- Junior Scratch programming environment
- App Go to basic operation of robot
- App Xylo to make music with the robot
- App Path to "program" the robot paths and actions with sounds etc.



Group 5+ years

Activity 1 - Basic Operation

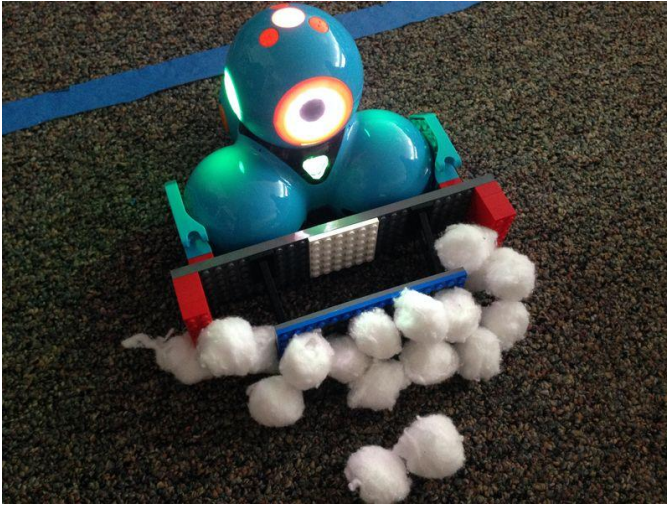


- We use Ipad App Go with the purpose of moving the robot (left, right), the lights change colors (red, yellow etc.)
- We disguise the robot with LEGO making what they want.

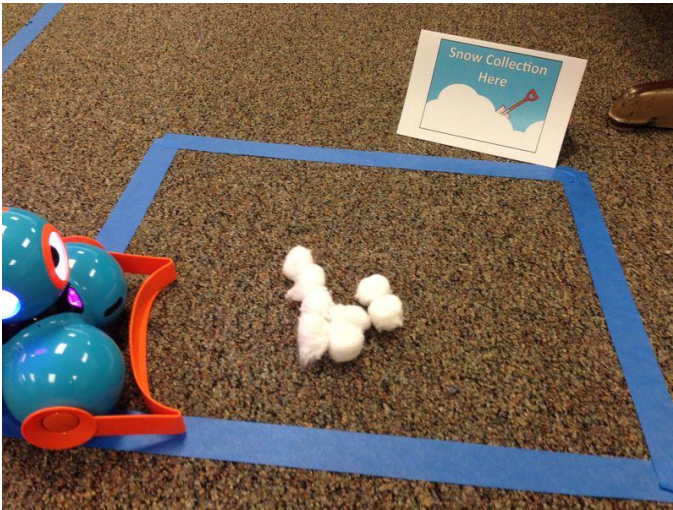


Group 5+ years

Activity 2 - Snow Patrol



We use the Ipad App Path for students to program the direction you have to move the robot to clean snowballs.



We can use LEGO pieces to build a shovel excavator to move the snow

Group 5+ years

Activity 3 - Music



We use the App Xylo order that the robot touches the music that we program it the xylophone with the Ipad.



Group 5+ years

Activity 4 - Programming

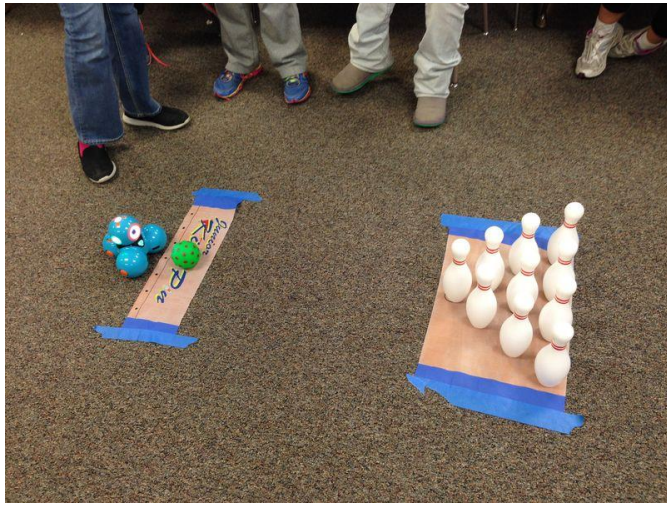


Learning to program small games and interactive stories using the Ipad and the Scratch programming language for children between 5 and 7 years.



Group 5+ years

Activity 5 - Bowling



Bowling played by a ball.
The kids are having fun
while driving the robot to
Go or Path application as
children age.



As always wins that more
pull bowling ... 😊

Group 8+ years

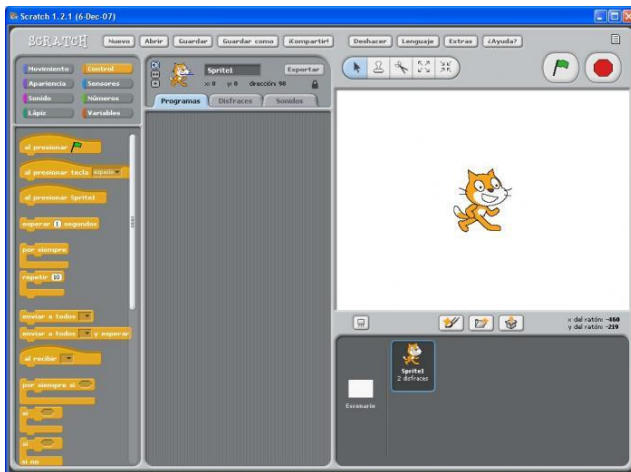
- ❖ Skills that work
- ❖ Means used
- ❖ Examples of activities

Skills

- Encourage creativity and imagination lead to real life.
- Actual use of mathematics.
- Design of algorithms by programming blocks (Blockly)
- Analytical and algorithmic thinking
- programming

Group 8+ years

Means used



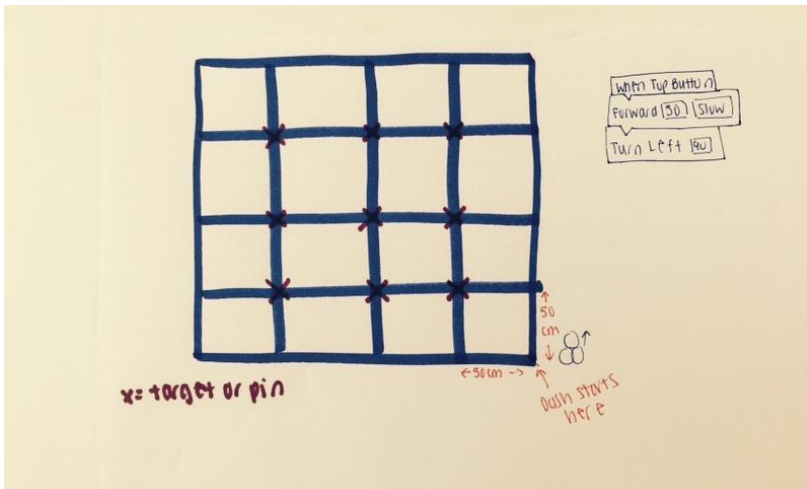
- We use two robots, Dash & Dot
- We use a Ipad Tablet or Android.
- We use LEGO
- App Blockly to program the robot through this visual language.
- Scratch programming

Group 8+ years

Activity 1 - Pull the pins



We use the App **Blockly** to schedule the demolition of bowling in a gridded surface 50x50cm.



We design the grid with ribbon and program the robot.

Group 8+ years

Activity 1 - Pull the pins

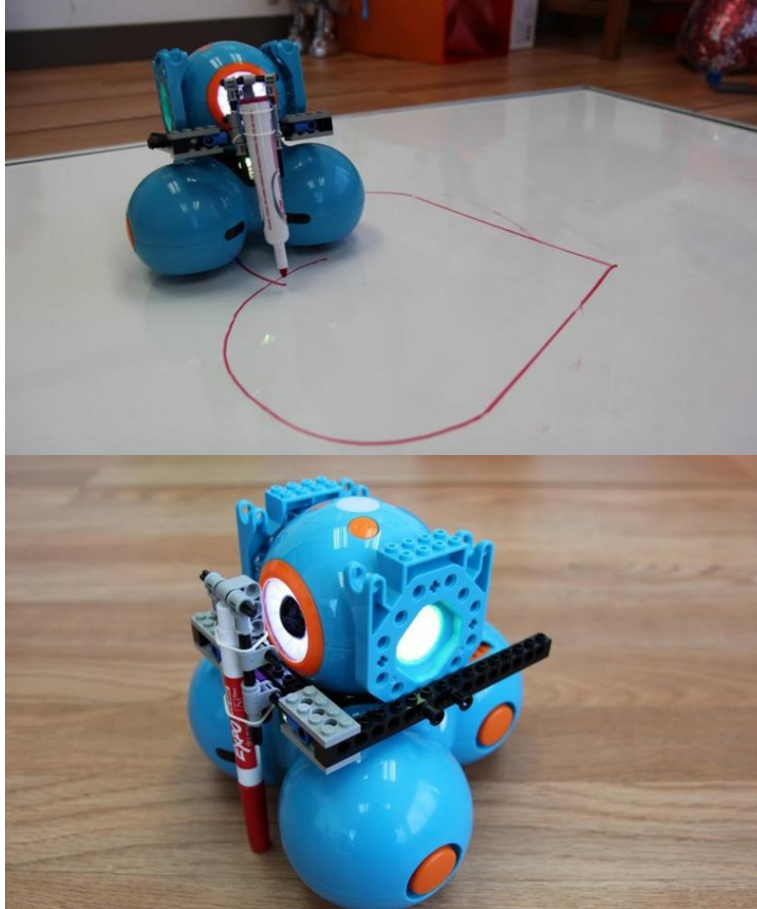
Depending on the level and age, each student decides how they want to program:

- ✓ sequential programming
- ✓ Programming a remote control to handle Dot another robot.
- ✓ Program the robot to rotate the ring a slap, and use external sounds for actions on the robot.



Group 8+ years

Activity 2 - Draw



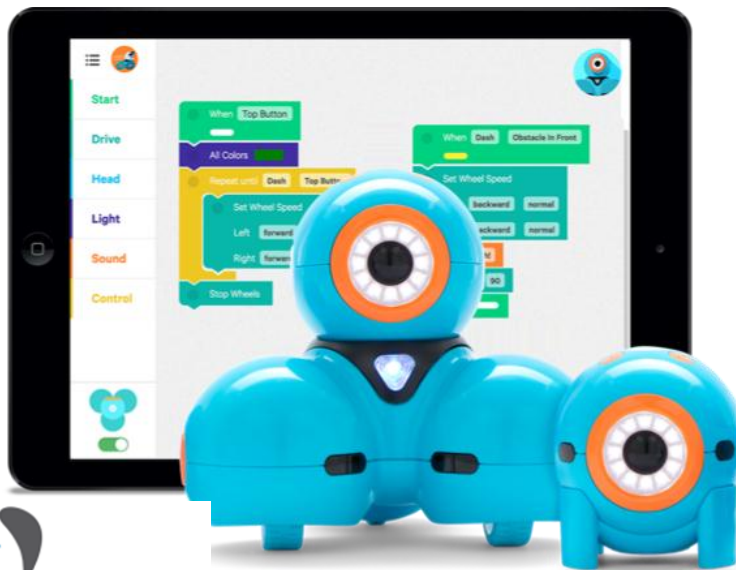
We use the App **Blockly** to program the robot to draw, for example, a heart on paper with a pen. Adapted by LEGO, the robot so it can handle the pen.

Group 8+ years

Activity 3 - Obstacles



We use the App Blockly to program the movement of the robot to the circumstances of the path. Children learn to think algorithmically as they break down the movements to be performed by the robot and program



Group 8+ years

Activity 4 - Programming



Scratch programming to create small games and interactive stories. This environment is more complete than that used in children aged 5+.



SCRATCH

This programming we do from a computer.

Group 8+ years

Activity 4 - Programming



Scratch is a learning environment programming language that allows children and beginners learn to program.

Created by the Media Lab at MIT (Massachusetts Institute of Technology)

Group 8+ years

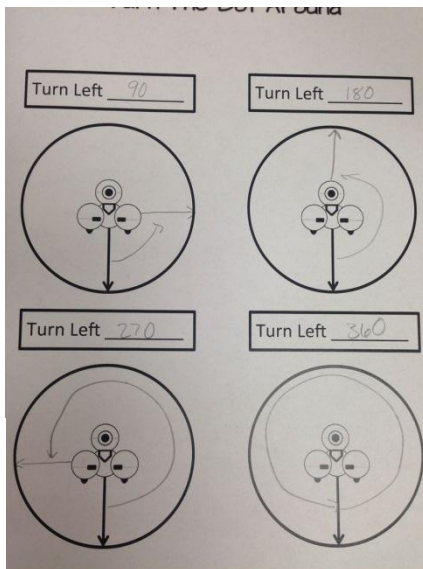
Activity 5 - Mathematics



We learn to measure the distance of advance of Dash robot.

We learn to calculate degrees of rotation of Dash robot.

We do a countdown lights Dot robot.



Group 12+ years

- ❖ Skills que se trabajan
- ❖ Medios que se utilizan
- ❖ Ejemplos de actividades

Skills

- Actual use of mathematics and logic
- Design of algorithms by programming blocks (Blockly)
- Programming robots using high level language like Objective C to develop our own applications for Ipad.
- Analytical and algorithmic thinking
- Programming simple web pages

Means used

- We use two robots, Dash & dot
- We use a Tablet Ipad
- App Blockly to program the robot through this visual language.
- Objective C programming language Apple or Java.
- Computers to program

Group 12+ years

Create Apps for robot

- Programming the robot using a high level language such as Apple Objective C or Java. The student will learn basic concepts of learned language Blockly.
- Small Apps were developed for Ipad where students can customize and manage the robot but with their own software development.
- For more advanced children programming



Objective-C

Group 12+ years

Websites and Internet

- We teach programming in HTML.
- We use the Internet as a business tool
- Creating your own website with images, videos etc.
- Here is the website on internet
- We create our own educational blog
- We create our personal page
- Etc.

Family groups

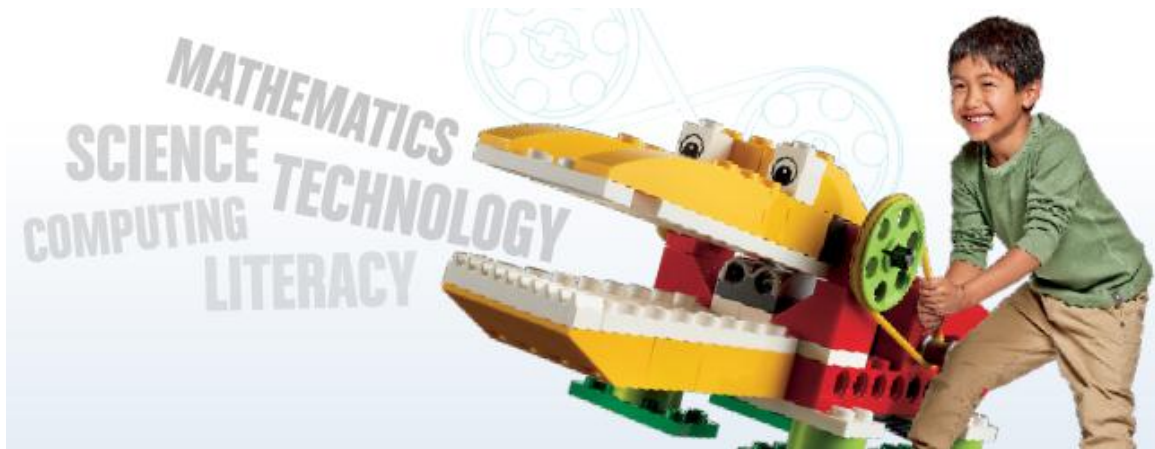
- ❖ Monthly Workshop on Saturday morning where the father / mother and child can be a morning learning, playing, enjoying family and programming robots.
- ❖ Activity outside school
- ❖ Hours 10:00 to 12:00 or 12:00 to 14:00.

Resources neededs in the School

- ❖ Computerized scheduling room
- ❖ Projector explanations
- ❖ The Dash & Dot and Tablets robots provide us share a robot / tablet every two children.



ROBOTICS FOR ALL



Robotics 6+ years

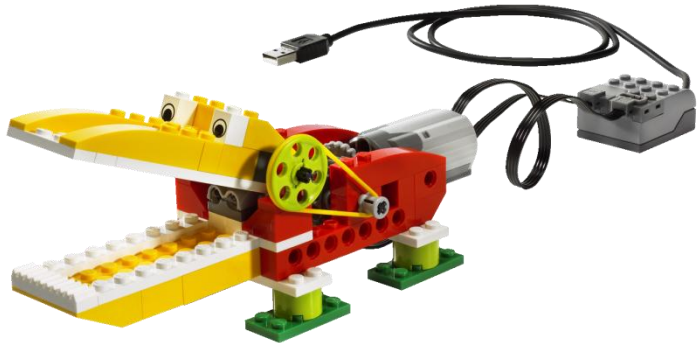


Tool introduction to robotics fun and easy to learn.

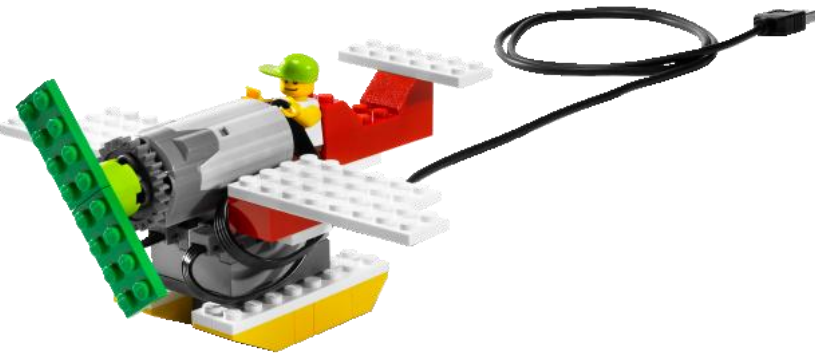
Ideal to continue learning to program, storytelling, stories, work with simple mechanical (lever, pulley) etc. all in a collaborative and much amused.



Robotics 6+ years



Unlike Dash & Dot, here is to build the different robots with LEGO pieces, attach the sensors and motors etc.



At the end using the Scratch programming language from a computer program the operation of sensors and motors.

Robotics 9+ years and Adults



We use LEGO Mindstorms, complete robotic solution for nine years until college that fosters creativity playing learning science, technology, engineering, mathematics and programming.



Allows students to discover the actual programming controlling input and output devices.

Resources neededs in the schools

- ❖ Computerized scheduling room
- ❖ Projector explanations
- ❖ LEGO robots and programming software provided by us.

Thanks!



We are partner