

Building Competences Through Games and Robots

Iro Voulgari

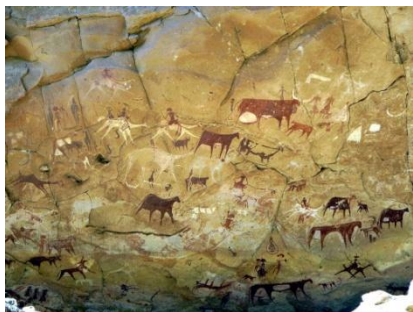
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National University of Athens

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Preschool Teacher, Researcher, Department of Educational Sciences and Early
Childhood Education, University of Patras



Digital Storytelling



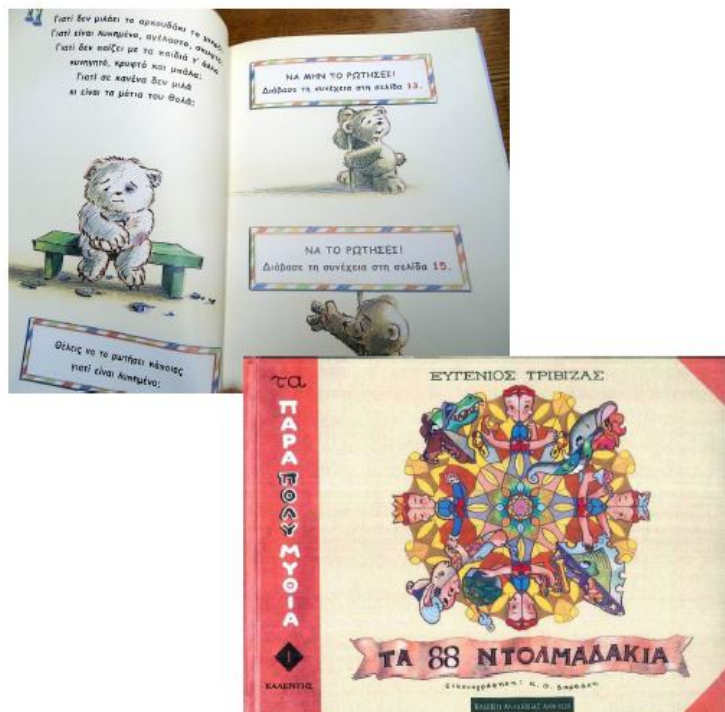
Storytelling

- Communication
- Learning
- Conveying a message
- Expressing emotions, ideas

Digital Storytelling

- Digital medium
- Multimedia
- Interactivity
- Creativity, participation
- Sharing

Interactive Digital Storytelling



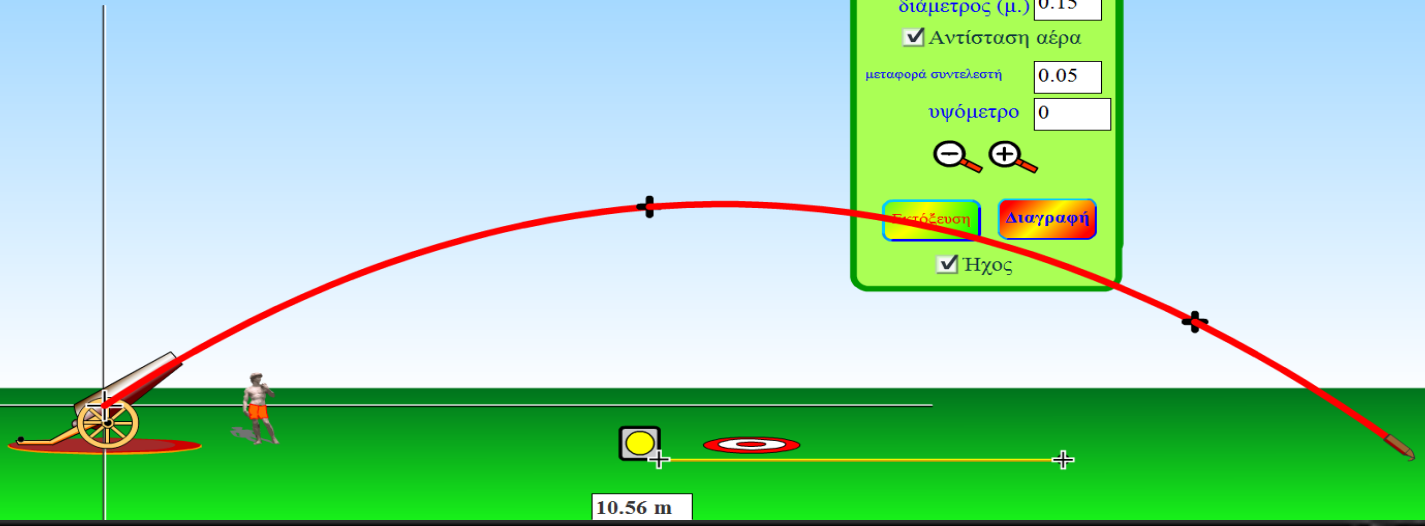
- Non-linear
- Interactive experience
- Individualised paths
- Author & Reader

Digital Games

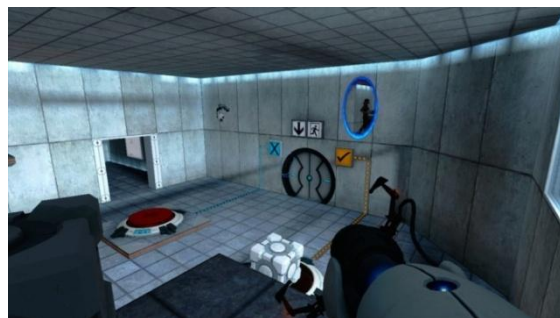
Σχετικά...

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απόσταση (μ.) ύψος (μ.) χρόνος (δ.)

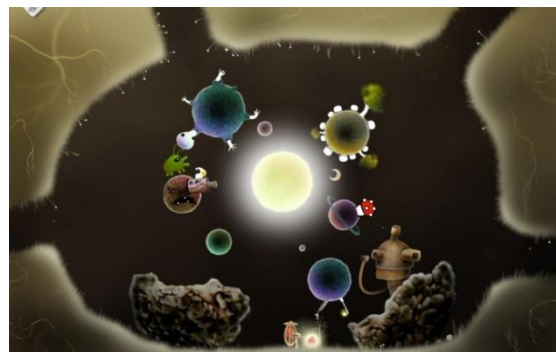
επιλογή χρήστη
οβίδα
μπάλα γκολφ
γωνία (μοίρες) 38.1
αρχική ταχύτητα (μ./δ.) 18
μάζα (κ.) 150
διάμετρος (μ.) 0.15
 Αντίσταση αέρα
μεταφορά συντελεστή 0.05
υψόμετρο 0
- +
Επιλογή Διαγραφή
 Ήχος



Digital Games Based Learning



- Problem solving
- Decision making
- Narrative
- Authentic context, meaning
- Role-playing



Digital Games & Empathy



Refugees



Depression



Autism

Angry Birds





Minecraft in Education



The children as **creators** of digital stories and games

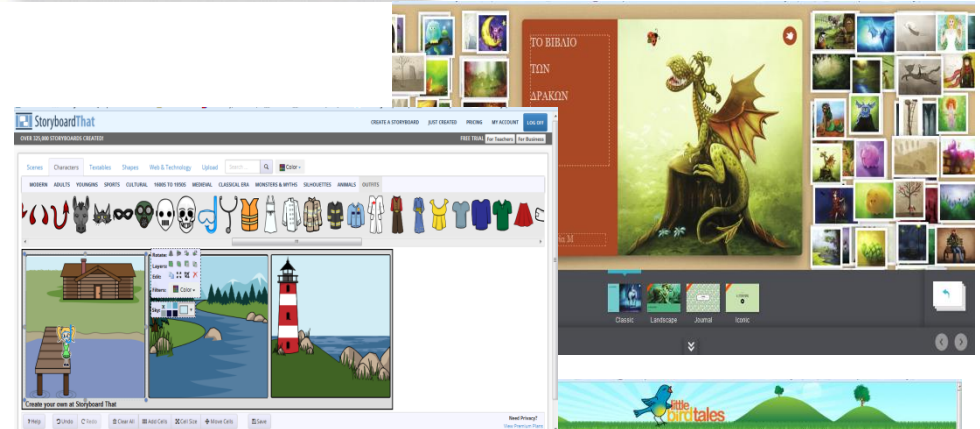


Children as Creators

- Transforming their favourite book or film into a digital story or game
- Telling their own story
- Expressive media, expressing interests, perceptions, viewpoints, ideas, personal stories
- Individually, collaboratively
- Sharing with others
- Active role
- Expression, creativity, fantasy
- Critical thinking
- Literacy, digital literacy
- Communication, collaboration
- Multiple view-points, empathy
- Information finding, comparing, examining, synthesizing
- Presentation skills

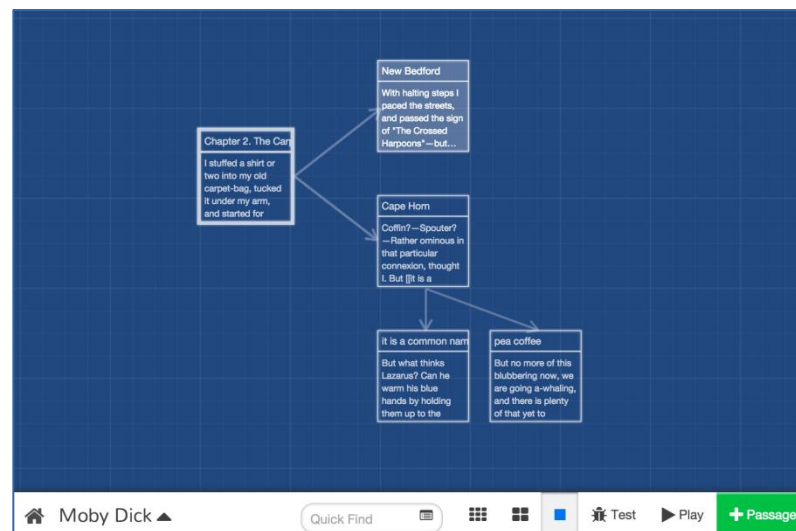
Digital Storytelling: Tools

- Voice Thread:
<http://voicethread.com/>
- Storybird:
<http://storybird.com/>
- Little Bird Tales:
<https://littlebirdtales.com/>
- Storyboard That:
<http://www.storyboardthat.com/>
- Microsoft Photo Story 3:
<https://www.microsoft.com/en-us/download/details.aspx?id=11132>



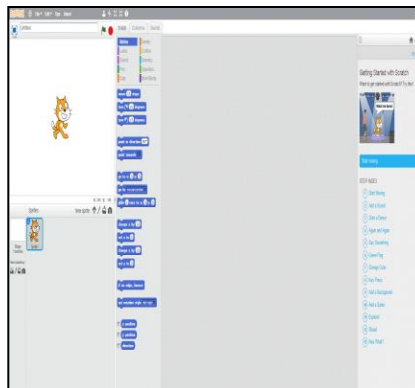
Interactive Digital Stories: Tools

- Create Your Own Story:
http://editthis.info/create_your_own_story/Main_Page
- Twine:
<http://twinery.org/>



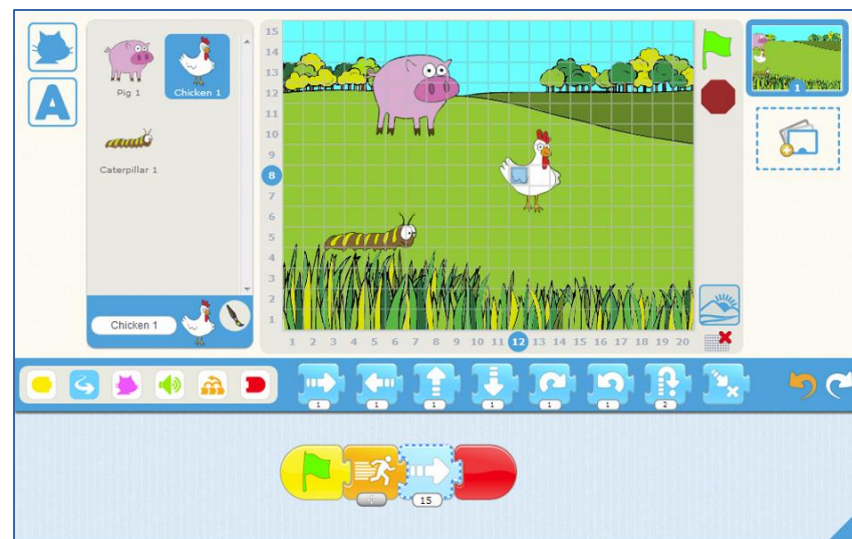
Digital Games: Tools

- Scratch:
<http://scratch.mit.edu/scratch2download/>
- Microsoft Kodu:
<http://www.kodugamelab.com/>
- GameStar Mechanic:
<https://gamestarmechanic.com/>
- PowerPoint, LibreOffice Impress

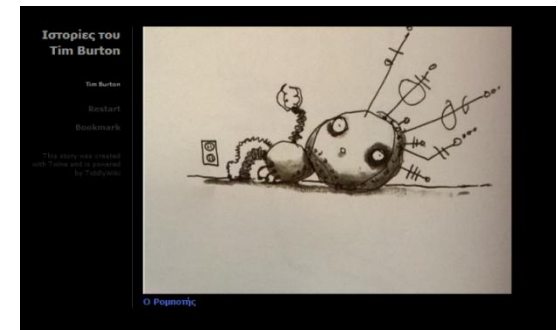
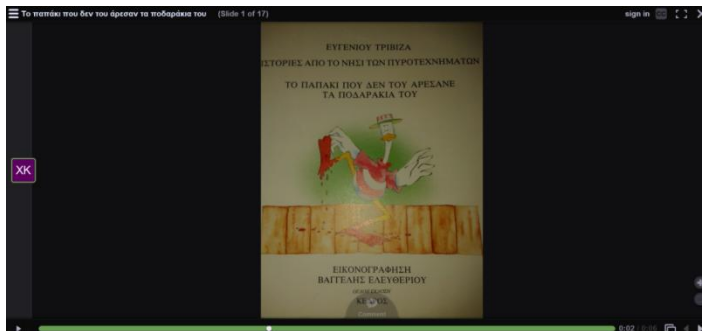
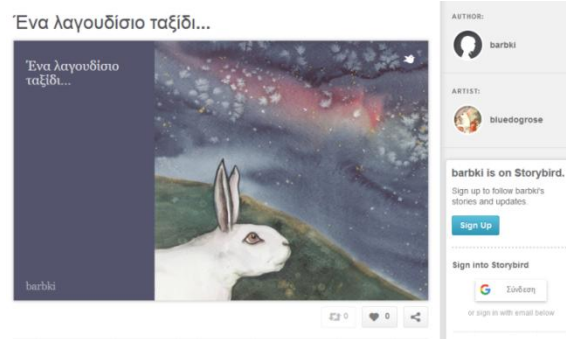


Digital Games: Tools

- ScratchJr:
<http://www.scratchjr.org/>
- Ages 5-7



Student Projects



Digital Stories and Games: Mobile Devices

- Integration of multiple tools (e.g. image and video editing, camera, audio recorder, web-search)
- Information gathering
- Capturing images, videos
- Example: video about butterflies by kindergarten students:
 - <http://www.youtube.com/watch?v=Y5b6y7DJuYk>
 - <http://vimeo.com/32850366>
- Sharing story via the web



Metamorphosis (Student Video)

from Doug Stotts 5 years ago | more

More from Animation
Autoplay next video

Participatory Game Design in the Kindergarten

- Children design a digital game
- Department of
Preschool Education,
National & Kapodistrian
University of Athens
- 47th Kindergarten of
Athens (public school)
- S. Vouvousira, A. Fakou



Προσχέδια: Τα Παιδιά σχεδιάζουν ένα Ψηφιακό Παιχνίδι για το Νεοκλασικό



Τα παιδιά σκέφτονται την ιδέα και την ιστορία

Αποφασίζουν τους στόχους και τις δοκιμασίες

Ζωγραφίζουν το storyboard του παιχνιδιού

Και το παιχνίδι τους υλοποιείται!

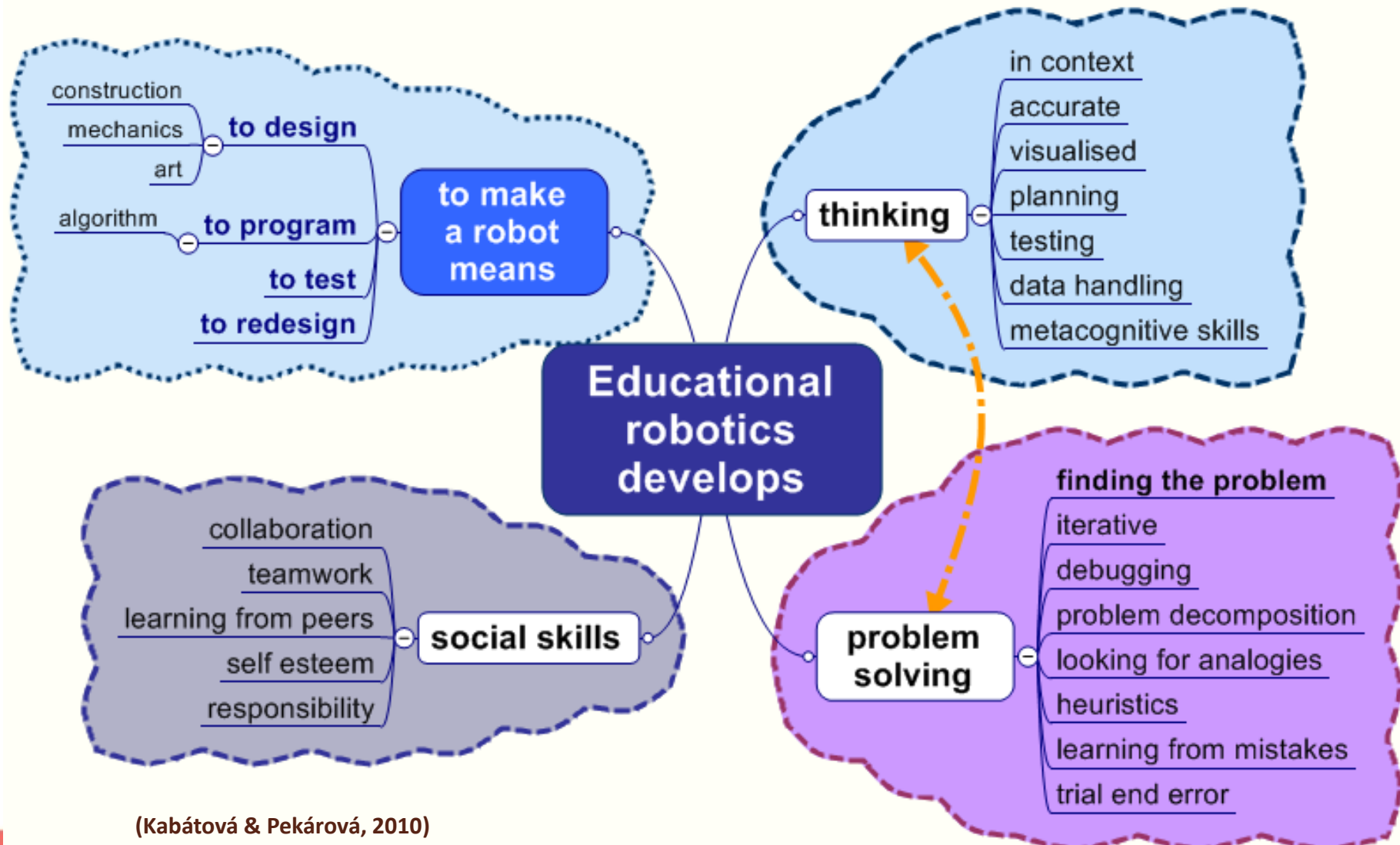
ICTE Group

Πανεπιστήμιο Πατρών
Τμήμα Επιστημών της Εκπαίδευσης και της Αγωγής
στην Προσχολική Ηλικία

Educational Robotics

- ICT in Education
- Pedagogical approach based on Logo
- Automotive preprogramed floor robots
 - Common rovers
 - Advanced rovers
 - Rovers with sensors
- Robot Construction

Educational robotics: Goals



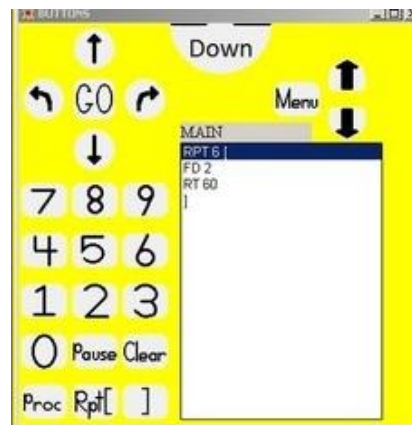
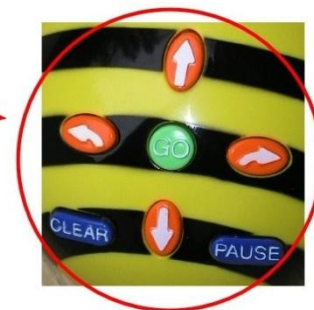
(Kabátová & Pekárová, 2010)

Programming

- Educational programming through robotics
- Educational programming with robotics, cards, etc
- Visual educational programming with blocks
- Object oriented programming
 - Computational thinking
 - Problem solving

Bee-Bot & Pro-Bot

- Preprogramed floor robots
 - Bee-Bot
 - ProBot
- Movement programming based on Logo
- It is programmed with sequential commands
- to perform a route on an organized (grid mat) floor
- For
 - Gain skills, problem solving competence, feedback, social skills, self-esteem and self-confidence



<http://www.tts-group.co.uk/pro-bot-rechargeable-floor-robot/1009825.html>

Bee-Bot: Overview

Ευδιάκριτα πλήκτρα εισαγωγής εντολών προγραμματισμού και κίνησης .

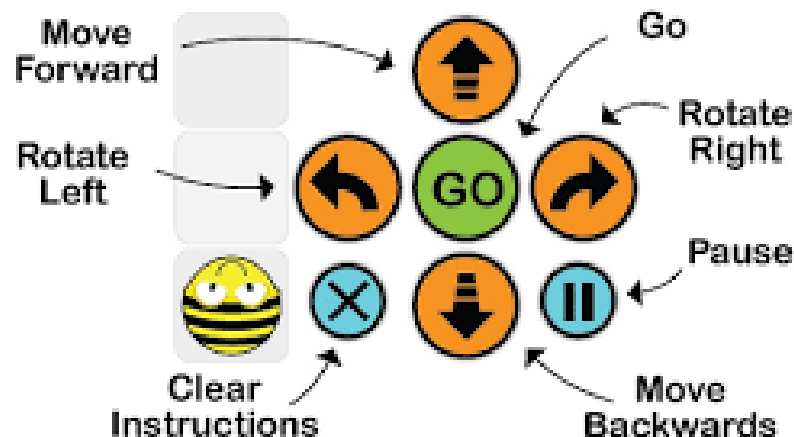
Ικανότητα απομνημόνευσης 40 εντολών προγραμματισμού που εισάγονται από τους μαθητές.

Κίνηση ακριβείας κατά 15cm εμπρός/πίσω (βήμα) και στροφή κατά 90 μοίρες δεξιά/αριστερά

Ήχοι και ενδείξεις φωτός (αναβοσβήνουν τα μάτια του ρομπότ) για επιβεβαίωση κατά τον προγραμματισμό.



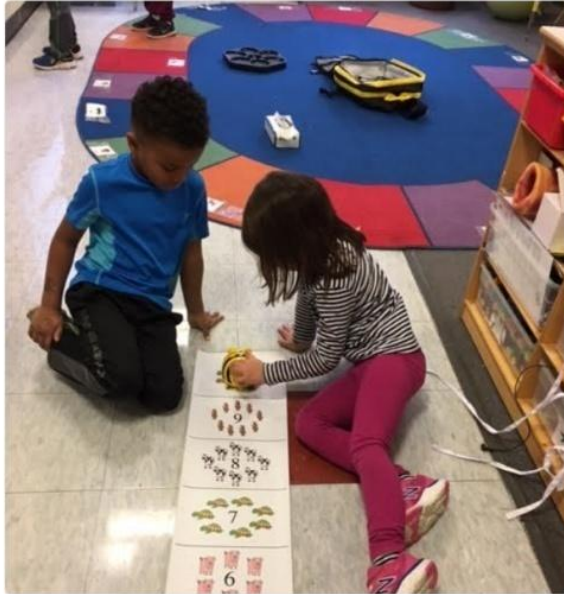
How to play Basic Controls



<https://www.flickr.com/photos/auladetecnologia/14444310332>



Sharon Davison @kkidsinvt · Oct 31
Exploring code in Kindergarten. Wonderful fun to see how children create code. #CSforAll @codeorg #wsdvt



Instagram



knitwalkswim

Follow

edonovan1985, lurquoise, ccslib, caitlin_ack, herc78, birdsallb, lfscott4, sara.h.00, jgr802 and tweegar like this

knitwalkswim Exploring code in Kindergarten. @wsdvt lurquoise I want that!!

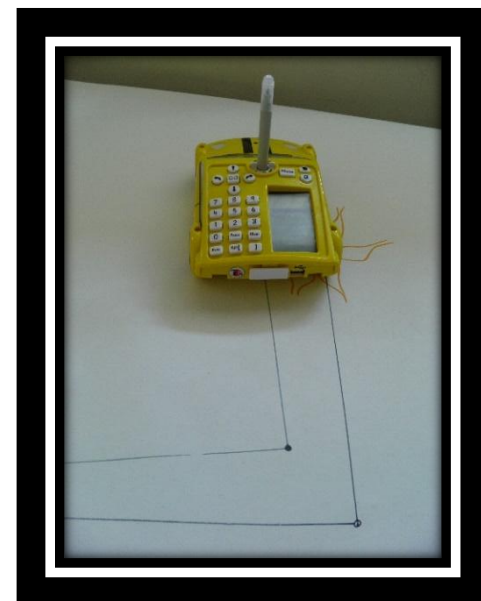
♥ Add a comment... ...

Bee Bots. The American School of Milan:
<https://www.youtube.com/watch?v=SUrmcZxYNdM>

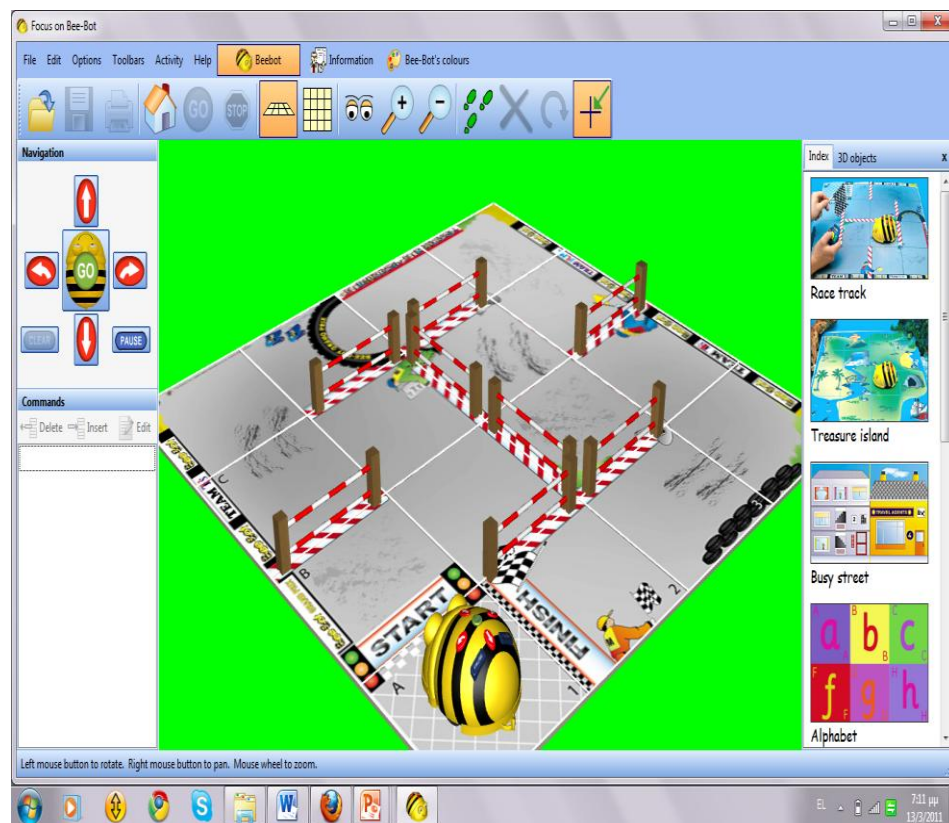


<https://www.youtube.com/watch?v=9KNfgmD-PVM>

<https://sparkleandwonder.weebly.com/sparkle-and-wonder/bee-bot-olympics>



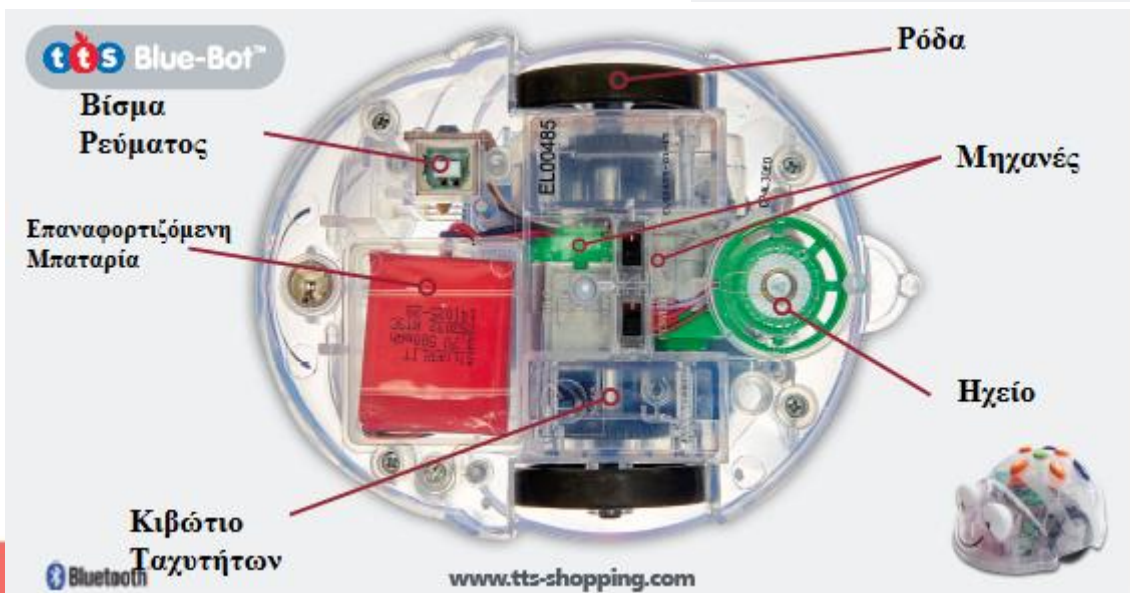
Bee Bot: Educational Programming



Sequence Cards

Software

Blue-Bot™ (Rechargeable, Bluetooth, floor robot)



To Blue-Bot:TTS Electronics
(<http://www.tts-group.co.uk/shops/tts/Default.aspx>)



<https://www.tts-group.co.uk/blue-bot-bluetooth-programmable-floor-robot/1007812.html>

Junior Roamer Robot



Infant Roamer (5-7 ετών)
Primary Roamer (7-9 ετών)
Junior Roamer (9++ ετών)
Roamer Deluxe: «Προσαρμοστικό
ρομπότ», ανάλογα με την κάθε ηλικία.

- Roamer is an educational robot
 - Pre-School to Year 12 (PK-12)
 - Tom Stonier και Dave Catlin.
- It allocates its own programming language, based on Logo.
- Roamer first designed in 1990.
- Beff Award in 1998.

<http://www.tts-group.co.uk/pro-bot-rechargeable-floor-robot/1009825.html>



Thymio II.



Thymio is a small robot which will allow learners to discover the robotics and learn a robot's language.

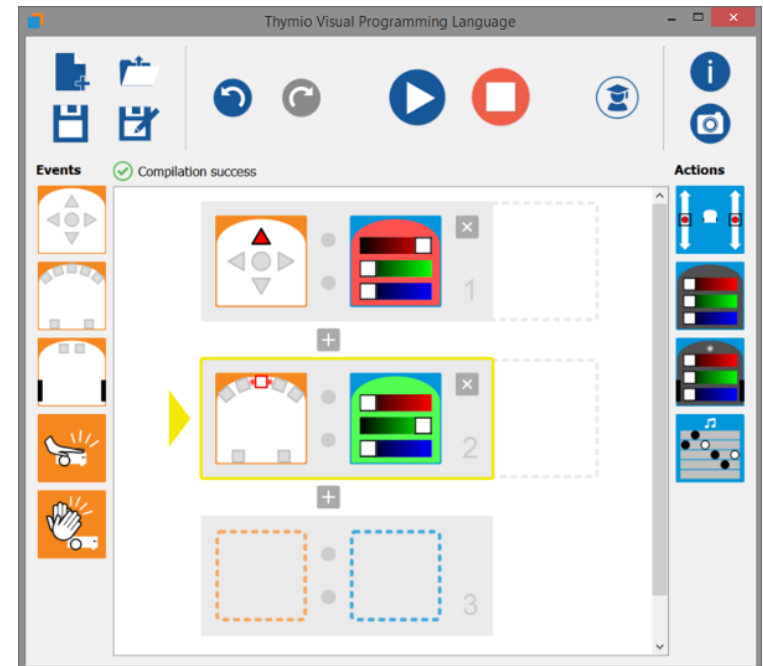
Basically it works with preprogrammed behaviors and sensors

Basic behaviours

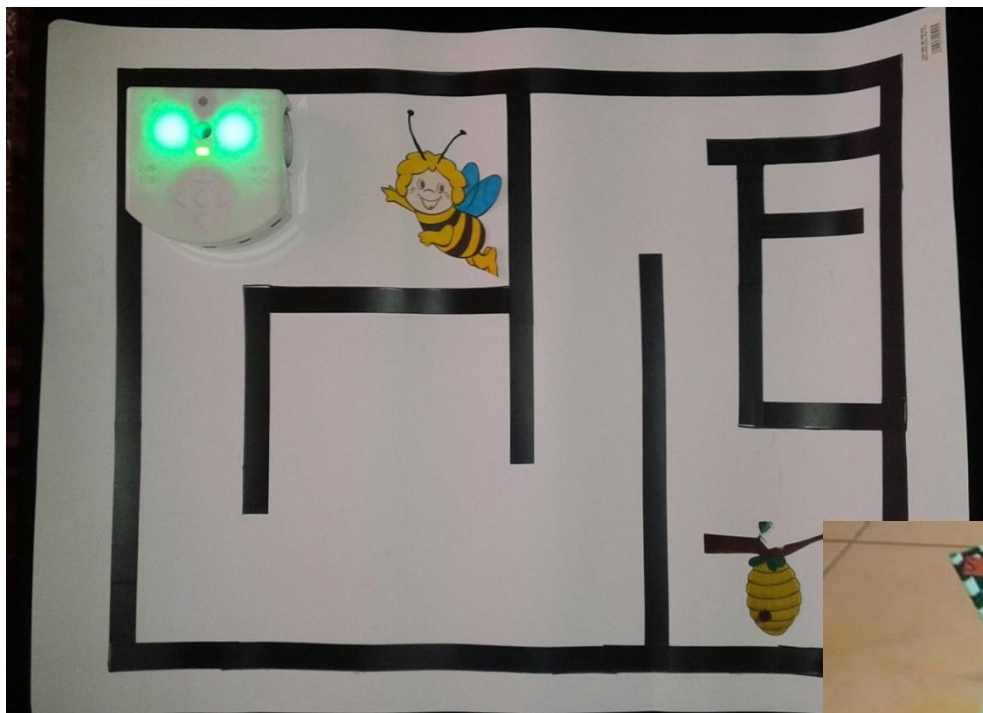
Thymio follows your hand, avoids obstacles, follows a line and much more, straight out of the box!

Visual, Blockly, Scratch and text programming

Program through events with pictures, text or a mix of both



Thymio – Thymio & Aseba, Powered by Wikidot.com, Retrieved 2008 , from <https://www.thymio.org/en:thymio>



EDISON

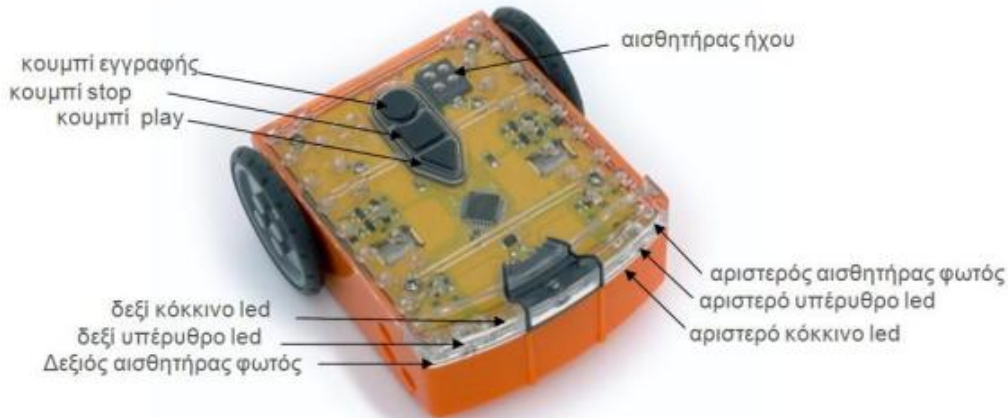
Edison is a STEM teaching resource for coding and robotics education designed for students from 4 to 16 years of age.

It has preprogrammed behaviors, which are enabled as the robot moves over specific barcodes

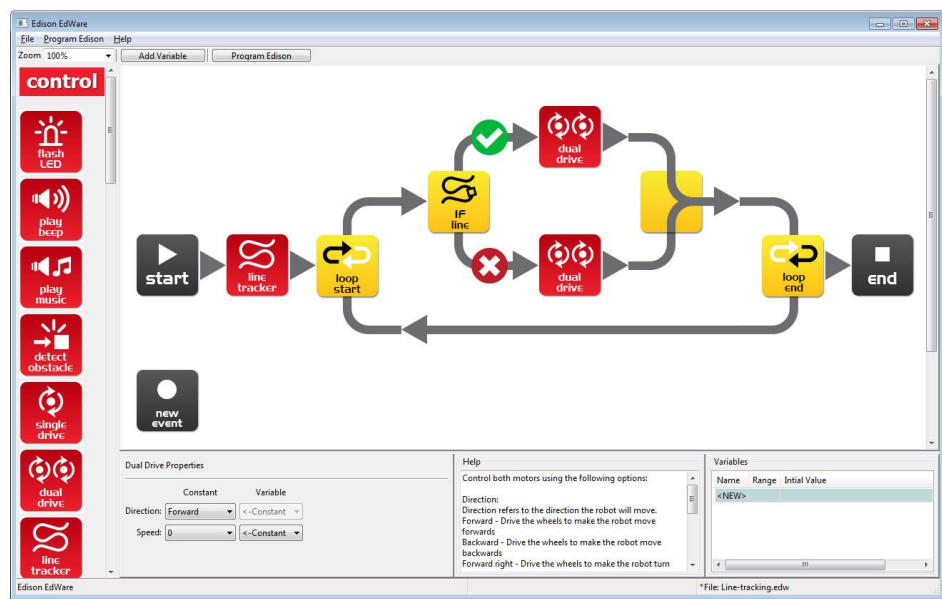
It is equipped with sensors and can:

- Respond to light and sound
- Follow lines and avoid obstacles
- Communicate with other Edison robots
- Connect to other Edison robots and LEGO bricks

EdBlocks: is a graphical robot programming environment with a drag-and-drop block-based system

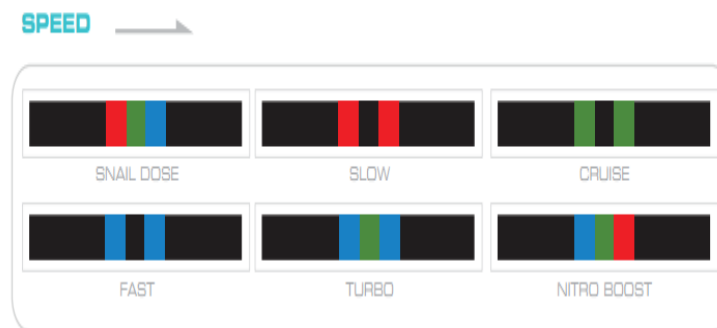


<https://meetedison.com/>

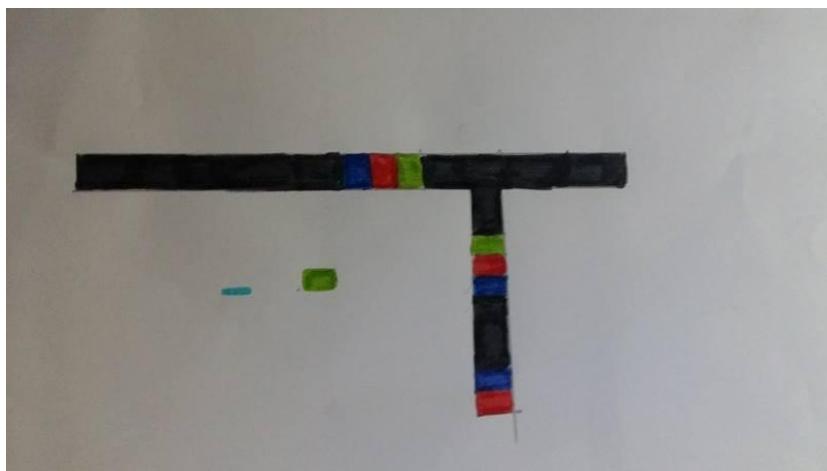
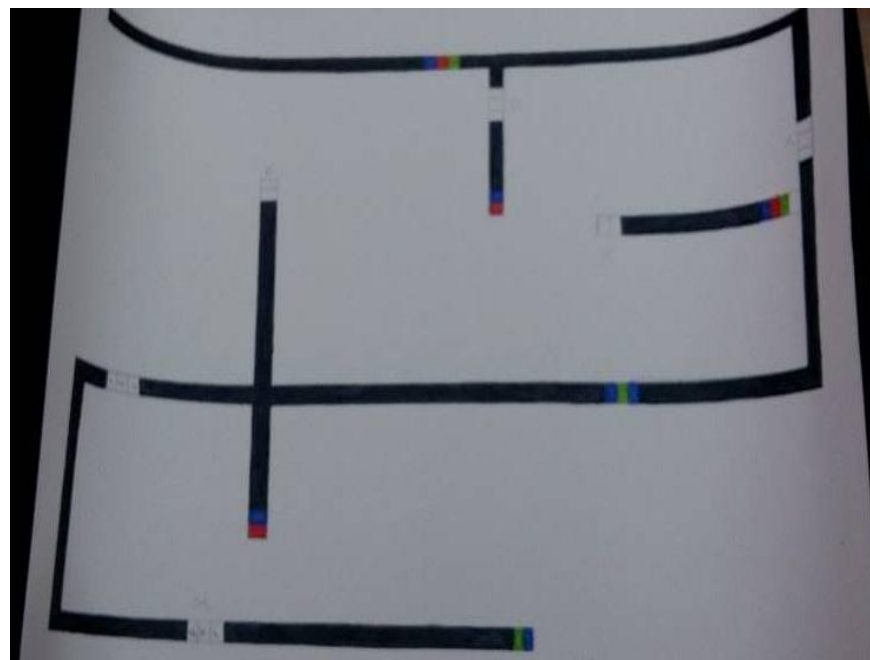


OZOBOT BIT

1. Ozobot is a small smart robot that is programmable through drawn lines and color codes, and through our easy-to-use OzoBlockly editor
2. **It is basically preprogrammed to move as it recognizes specific codes**
3. It has sensors which are able to read different codes



<http://ozobot.com/products/ozobot-bit>



Phiro – Robotics



Phiro robot:

It can be programmed to move with **Sequential Keys**

- arrow buttons that students use to program Phiro robot to move Forward, Backward, and Turn Right or Left

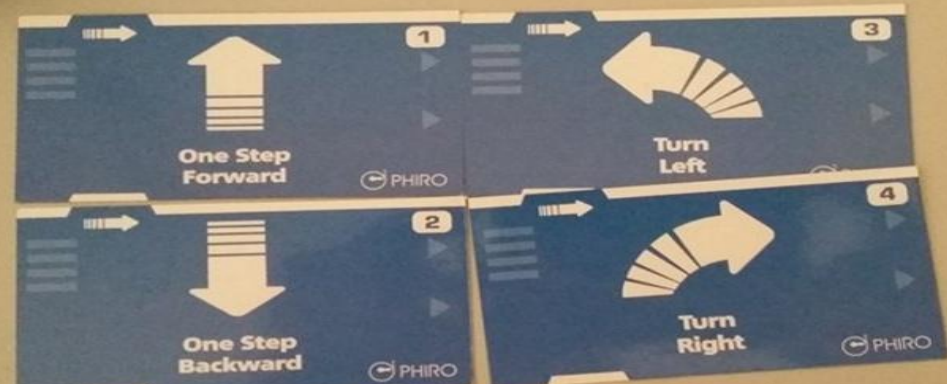
<http://www.robotixedu.com/phiro.aspx>

Also students are introduced:
to **Card** programming idea of Phiro robot.

- Swish card: Identify and understand the 6 Color coded categories of Swish Cards: movement, music, control, light, pre-coded, DIY code cards.
- to **creative new codes**



<https://www.kickstarter.com/projects/2074714954/phiro-a-smart-robot-for-kids-learn-to-code-in-5-wa>





CUBELETS

Robot blocks

**Main idea:
Robot
construction**



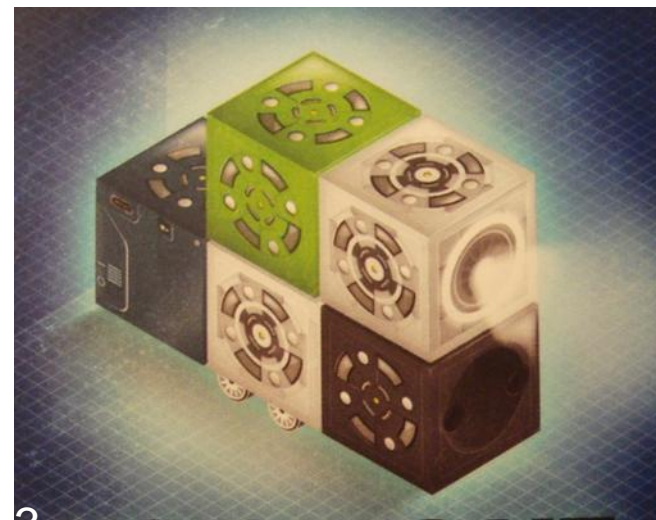
Robot blocks with preprogrammed behaviours
Adjoin the robot blocks together by using the magnets.

Every arrangement is a new robot with novel behaviours.



Preprogrammed Robot blocks

1. Dud Light
2. Fraidy Bot
3. Lookout



<http://www.modrobotics.com/cubelets/>

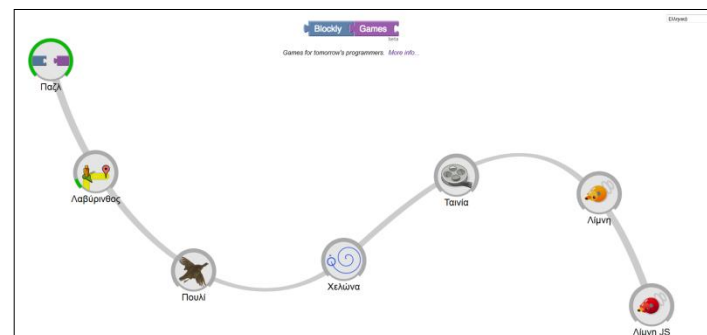


Robot Construction: Lego Resources



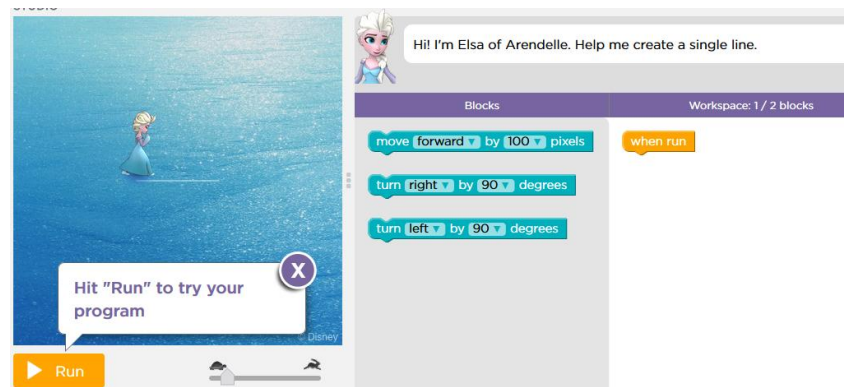
Educational Programming

- Code Monkey
Write code. Catch bananas.
Save the world
<http://www.codemonkey.com/>
- Τρέξε Μάρκο!
<http://marco.allcancode.com/>
- Blockly
Games for tomorrow's
programmers
<https://blockly-games.appspot.com/?lang=el>



Educational Programming

- Tynker Hour of Code:
<https://www.tynker.com/hour-of-code/>
- Lightbot. Solve Puzzles using Programming Logic: <http://lightbot.com/>, Demo puzzles: <http://lightbot.com/hocflash.html>
- The Foos:
<http://www.gamesforchange.org/play/the-foos/>
- Code Studio: <https://studio.code.org/>
- Πόλεμος των Άστρων. Κατασκευάζοντας ένα Γαλαξία με Κώδικα:
<https://code.org/starwars>,
<https://studio.code.org/s/starwarsblocks/stage/1/puzzle/1>
- Ψυχρά κι Ανάποδα. Γράψε Κώδικα με την Άννα και την Έλσα
<https://studio.code.org/s/frozen/stage/1/puzzle/1>



References

Images from:

- <https://flic.kr/p/aqMT9Z>
- <https://flic.kr/p/ogJ5GP>
- [https://commons.wikimedia.org/wiki/File:Prehistoric Rock Paintings at Manda Gu %C3%A9li Cave in the Ennedi Mountains - northeastern Chad 2015.jpg](https://commons.wikimedia.org/wiki/File:Prehistoric_Rock_Paintings_at_Manda_Gu%C3%A9li_Cave_in_the_Ennedi_Mountains_-_northeastern_Chad_2015.jpg)

Other Resources:

- <http://minecrafterdu.tumblr.com/post/120438815841/john-miller-minecrafterdu-featured-educator>

Digital Games:

- Anti-Sim <http://gamejolt.com/games/anti-sim/12761>
- Elude http://gambit.mit.edu/loadgame/summer2010/elude_play.php
- Ταξίδι Φυγής <http://www.taxidifygis.org.cy/>

- Kabátová, M. & Pekárová, J. (2010). "Learning how to teach robotics." Paper accepted for Constructionism 2010 conference.
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<http://www.etpe.gr/custom/pdf/etpe1848.pdf>
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- <http://education.lego.com/en-gb/products/wedo/9580/> (τελευταία πρόσβαση 19/03/11)
- <http://education.lego.com/en-gb/products/wedo/2000097/> (τελευταία πρόσβαση 19/03/11)
- <http://www.modrobotics.com/cubelets/>
- <https://www.modrobotics.com/cubelets/apps/cubelets-studio/>
- <https://www.generationrobots.com/en/content/76-getting-started-with-cubelets>
- <https://www.kickstarter.com/projects/2074714954/phiro-a-smart-robot-for-kids-learn-to-code-in-5-wa>
- Thymio – Thymio & Aseba, Powered by Wikidot.com, Retrieved 2008 , from <https://www.thymio.org/en:thymio>
- <https://meetedison.com/>
- <http://why.gr/shop/educational-robotics/open-hardware/robotic-kits/edison-robot/>
- <http://www.tts-group.co.uk/pro-bot-rechargeable-floor-robot/1009825.html>
- <https://doc.terrapinlogo.com/doku.php/logo:commands:probot#probotread>
- <http://ozobot.com/products/ozobot-bit>
- <http://files.ozobot.com/stem-education/ozobot-teachers-guide.pdf>
- <http://files.ozobot.com/stem-education/ozobot-tips.pdf>
- <http://files.ozobot.com/stem-education/ozobot-ozocodes-reference.pdf>
- <http://ozobot.com/play>
- <https://www.flickr.com/photos/auladetecnologia/14444310332>