



PROBOT

LEARNING PROGRAMMING WITH ROBOTS



The Partners



PROBOT

Coordinator



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PROBOT Objectives

PRO BOT Objectives

- Promoting innovation and interdisciplinarity (STEM) in secondary education by developing and disseminating robotic programming lessons for students and teachers
 - Design
 - Implementation
 - Evaluation



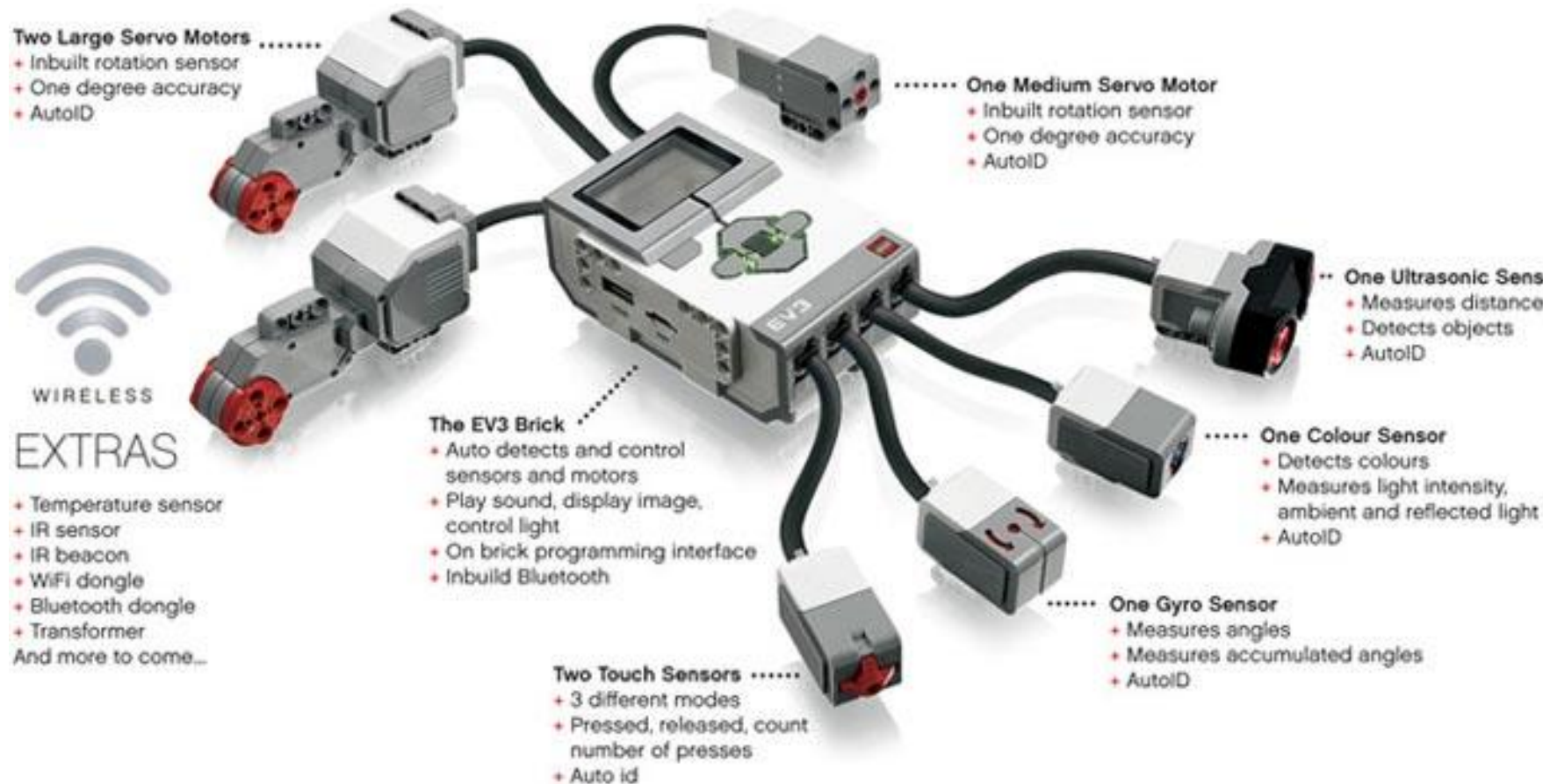


The Robots

LEGO Mindstorms® EV3



Lego Mindstorms® EV3



Why Lego Mindstorm

- Students have previous experience with Lego bricks
- Powerful software and hardware
- Simulation environments available
 - ▣ Avoid buying a kit for each student
- Third-party software and hardware
- Low cost
 - ▣ Students may buy a kit for experimenting at home
- Widely used platform (several resources in the web)

Why Python



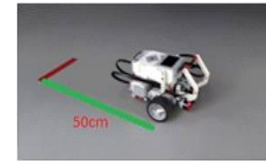
- Modern, short, very powerful programming language
- Professional developers use textual programming
- EV3-G programs run slower
- The EV3-G has a limited set of functions
- Amazing community of Linux / Lego hackers who have created the EV3Dev platform
 - Debian with drivers for sensor / engine control and language libraries
 - microSD card with the OS.
 - PC – ev3 SSL with a wi-fi dongle

Our Projects so far

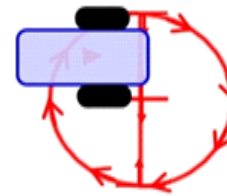
- Gravitational Acceleration (g)



- Drive 50 cm straight ahead

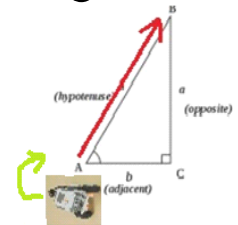
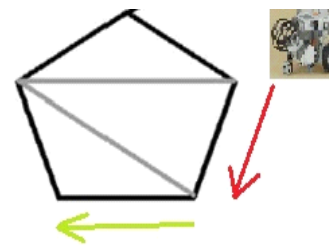


- Complete on-site rotation



- Move along the hypotenuse of a rectangular triangle

- Draw a regular pentagon



E-learning

- Electronic courses
 - Freely accessible

- Mathematics courses at Moodle server of our school's IT Lab:
 - <http://srv-1lyk-aigiou.ach.sch.gr/moodle/course/view.php?id=9>

- g Physics course on LAMS community
 - http://lamscommunity.org/lamscentral/sequence?seq_id=2264829

Students At Work





Conclusions so far

- Students improve their skills and learning of Physics, Mathematics, Programming, Engineering
- Increased interest and motivation
 - ▣ Turning learning into play
- Teacher's comments
 - ▣ The children were starting out. "It seems very complicated to me, I can not do that ..."
 - ▣ Soon they were excited. They first plotted on the paper and then made the construction.
 - ▣ Some students did not want to stop working on breaks.
- Very active participation
 - ▣ This did not exist when the subject was taught in the traditional way.

Next lessons

Chemistry



THANK YOU