



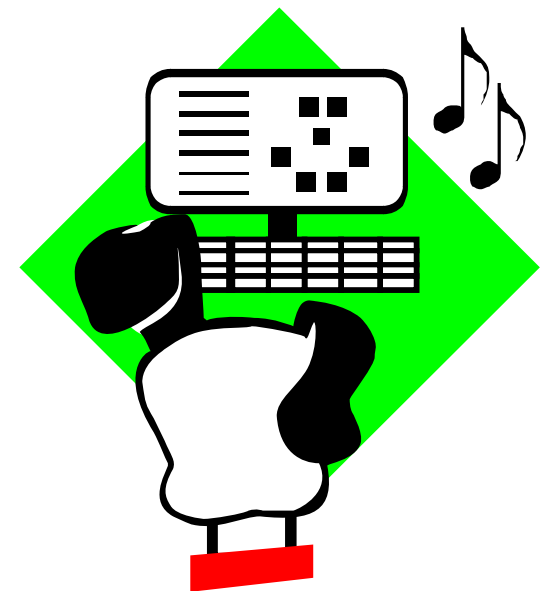
# Educating through Gaming

EduGaming with KodeKLIX



# The KodeKLIX Vision

- Educate our younger generation in electronics and associated sciences through motivating and fun-to-use handheld platforms
  - Maths, logic, programming
- Enhances creativity
  - Graphics
  - Music / sound
  - Story and strategy





# Teaching electronics to kids

- Use hardware with a purpose
  - Display, joystick, buttons, speakers,...
- Focus on coding language blocks
  - Overall program treated as smaller junks
- Focus on direct I/O rather than “app level”
  - Maintain a level of insight to the hardware
- Make it interesting and compelling
  - Motivation driven rather than a chore



# Not just for GEEKS...

- Gaming is cool, and includes a variety of creative disciplines
  - Graphics
  - Music / sound
  - Logic and strategy
  - Coding and maths
- Need to simplify programming (app making) since it can be difficult to get initial results
  - Slow start = lack of interest in continuing
  - First customisation made as simple as changing graphics or tune





# Game Design in High Schools

## The positive effects of gaming in education

### [President Obama wants game design in high schools...](#)

"Given how pervasive computers and the Internet is now and how integral it is in our economy and how fascinated kids are with it, I want to make sure that they know how to actually produce stuff using computers and not simply consume stuff," he said.

<http://www.polygon.com/2013/2/18/4000562/obama-extols-the-benefits-of-gaming>  
By Alexa Ray Corriea on Feb 18, 2013 at 9:33a @AlexaRayC

<http://www.destructoid.com/president-obama-wants-game-design-in-high-schools-245745.phtml>  
11:30 AM on 02.18.2013



# SnapCPU – for the Beginner

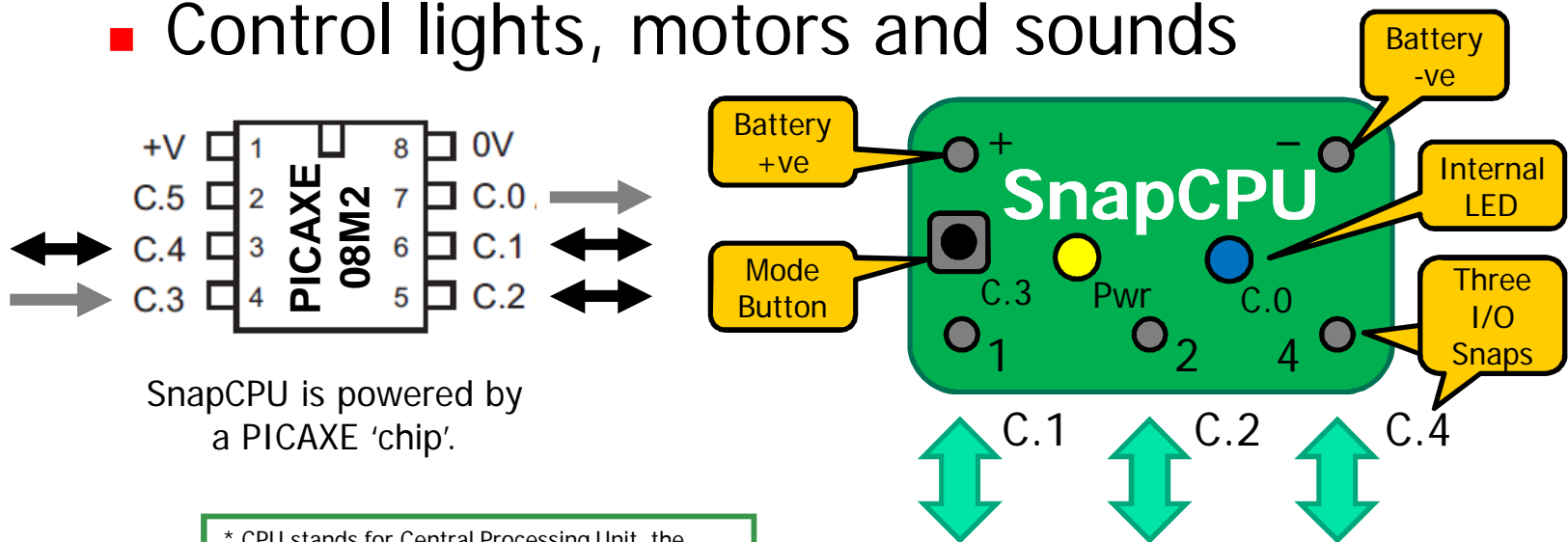
- Standalone electronic and coding platform
  - More exciting than *just* electronics
  - Include display, sound, input controls, etc
  - Allows for more challenge as skills improve
- Safe and easy to experiment with
  - Snap components require no soldering
  - Code using standardised visual tools
  - Ever-expanding number of projects





# SnapCPU - Hardware

- SnapCPU is a whole computer\* in one chip
  - Snap connections for inputs and outputs
- The I/O\*\* can be coded to do things
  - Read buttons, switches and other sensors
  - Control lights, motors and sounds



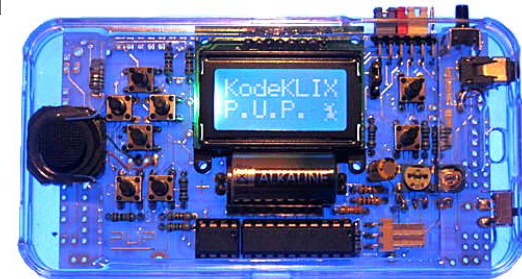
\* CPU stands for Central Processing Unit, the brain where everything is controlled from  
\*\* I/O describes the Inputs and Outputs

SnapCPU is easier to connect to circuits because of 'snaps'



# PUP – a Gaming Platform

- Standalone gaming platform
  - Include display, sound, input controls, etc
  - Allows for more challenge as skills improve
- “Cool” handheld form factor
  - Less geek, more appeal
  - Portability; sharing, promoting, but also practical – home to school, to friends
  - Hardware simpler and lower cost than TV console – a one chip solution!







# Handheld Gaming Hardware

- Based on PICAXE 20M2 (or derivatives)
  - Future versions may use other PICAXE chips
- LCD 8x2 display; monochrome only
  - 8 custom "sprites" at any given time
  - Future versions may use more complex displays
- 2x Sound Channels (background, foreground)
- Range of control inputs; analog thumb-pad, buttons, other e.g. tilt, IR, etc
- Battery powered, optional case / backplane
- Simple connection for program download



# Why use a PICAXE?



- PICAXE are a series of pre-programmed microchips used widely in educational curriculum in the UK
  - On-board firmware allows the chips to be programmed in BASIC via free downloadable tools
  - Used mostly for simple electronic demonstrations (e.g. "flashing LEDs") and robotic projects
  - Also have a strong hobbyist following

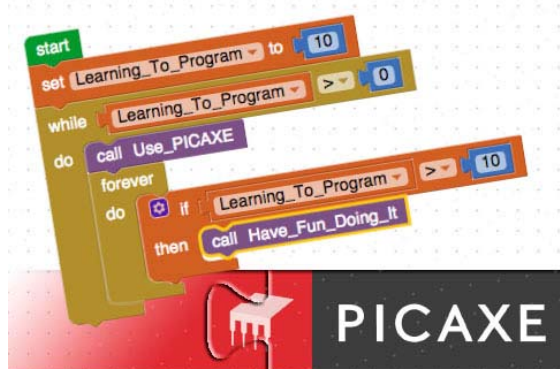




# Guide to Coding Software

## BLOCKLY from PICAXE

Beginners will find it easier to start coding their SnapCPU™ by using a visual coding tool as this. The block-like programming style is based on Scratch developed by MIT, and lets you develop skills with smaller projects.



## KodeKLIX for SnapCPU/PUP

Those ready to go the next step to code more complex projects can migrate to easy-to-use BASIC through KodeKLIX™ integrated development environment which supports both the PUP™ and SnapCPU™.





# App Coding Suite

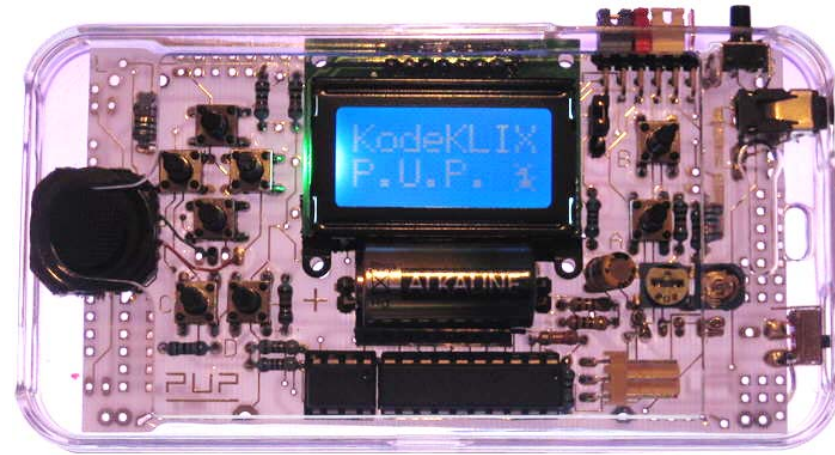
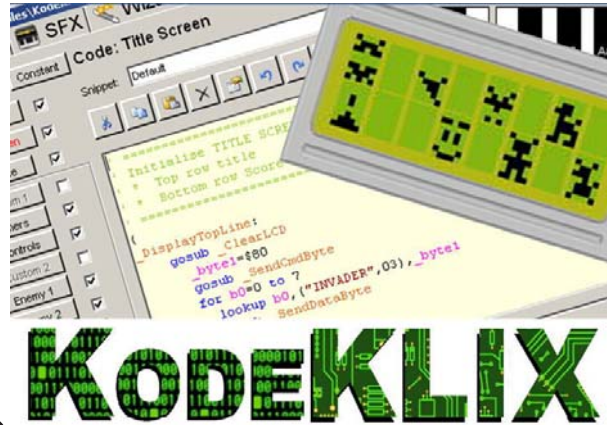
- Coding needs to be simple to start-up
  - Focus is to create programs (by coding), but not get bogged in details before a result is produced
  - Use of library routines to simplify coding
  - Use of macros commands to simplify routines
- Have scope for complexity to increase as interest and skills develop
  - Leave platform open to heavy customisation
  - Non-game applications: test, analysis, datalogging
  - Upgrade through more powerful PICAXE chips
  - Start with BLOCKLY / BASIC → direct PIC-asm



# Project Collaborations

- Recognition of individual skills
  - Everyone likes to create
  - Not everybody wants to code
- Development of team skills and project management
- Encourage sharing of ideas, components and finished projects





[www.kodeklx.com](http://www.kodeklx.com)

SnapCPU and PUP Handhelds

Creator:

Nick Coplin

Microchips:

PICAXE

PICAXE:

[www.picaxe.com](http://www.picaxe.com)