

# Why We Can't Wait for Raspberry Pi (the \$35 Computer, not the Dessert)

Kristin Fontichiaro – Shauna Masura – Terence O'Neill – Samantha Roslund  
UM School of Information – raspberrypi@umich.edu

4T Twitter Hashtag: #4T2012





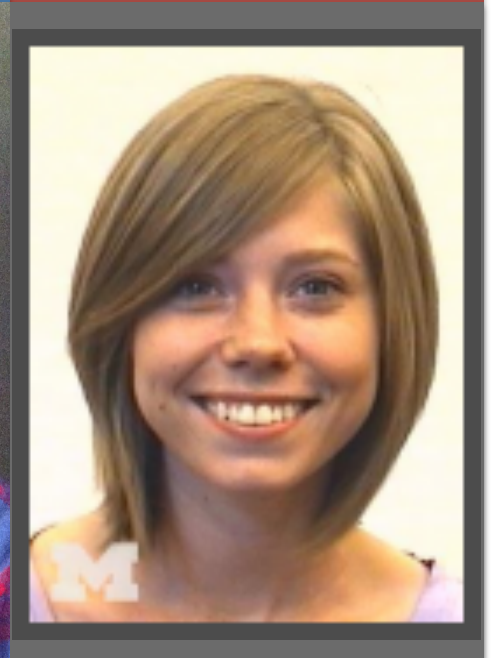
Kristin Fontichiaro



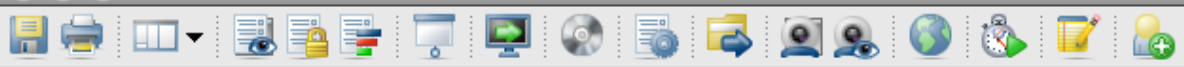
Sam Roslund



Terence O'Neill



Shauna Masura



### Participants

Hand	Close	Microphone	Video	Par...	↑↓
				Liz...	

1 Participant

### Chat

Show: All

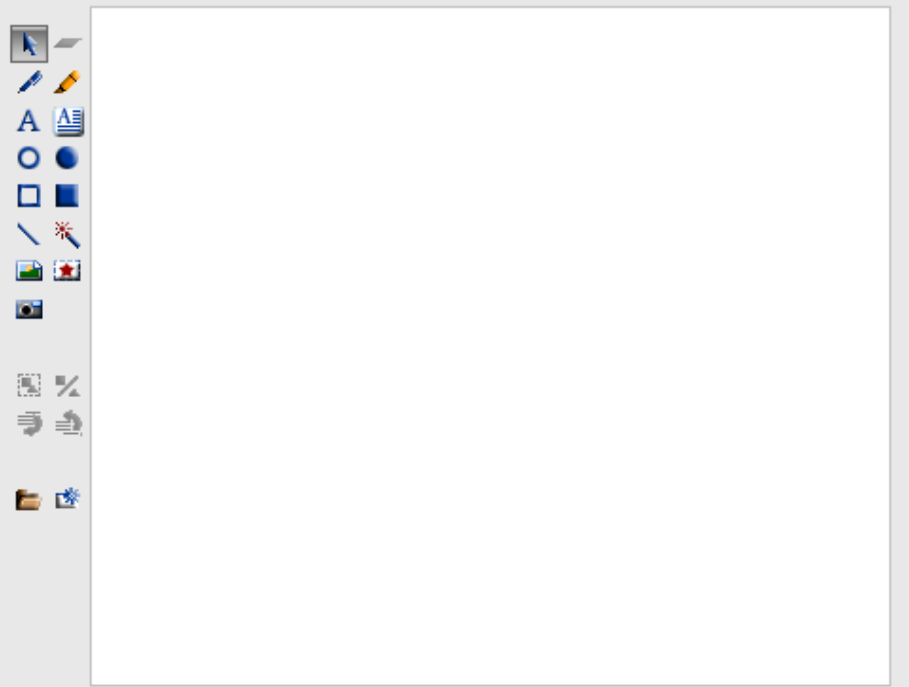
Joined on May 8, 2011 at 2:54 PM

**Moderator:** Hello!

Send to: This...

### Whiteboard - Main Room (Scaled 64%)

1/1 Public... Follow Moderator Roam



### Audio

^F2

Teleconference available

Alabama	Hawaii	Massachusetts	New Mexico	Tennessee
Alaska	Idaho	Michigan	New York	Texas
Arizona	Illinois	Minnesota	North Carolina	Utah
Arkansas	Indiana	Mississippi	North Dakota	Vermont
California	Iowa	Missouri	Ohio	Virginia
Colorado	Kansas	Montana	Oklahoma	Washington State
Connecticut	Kentucky	Nebraska	Pennsylvania	Washington DC
Delaware	Louisiana	Nevada	Rhode Island	West Virginia
Florida	Maine	New Hampshire	South Carolina	Wisconsin
Georgia	Maryland	New Jersey	South Dakota	Wyoming
Europe	Asia	Africa	South or Central America	Canada

# Our Agenda

- Getting to Know You
- What's a Raspberry Pi? (Kristin)
- How do you learn creativity? (Sam)
- What to do with RasPi (Terence)
- Welcome to the movement(Shauna)
- Resources
- Q&A

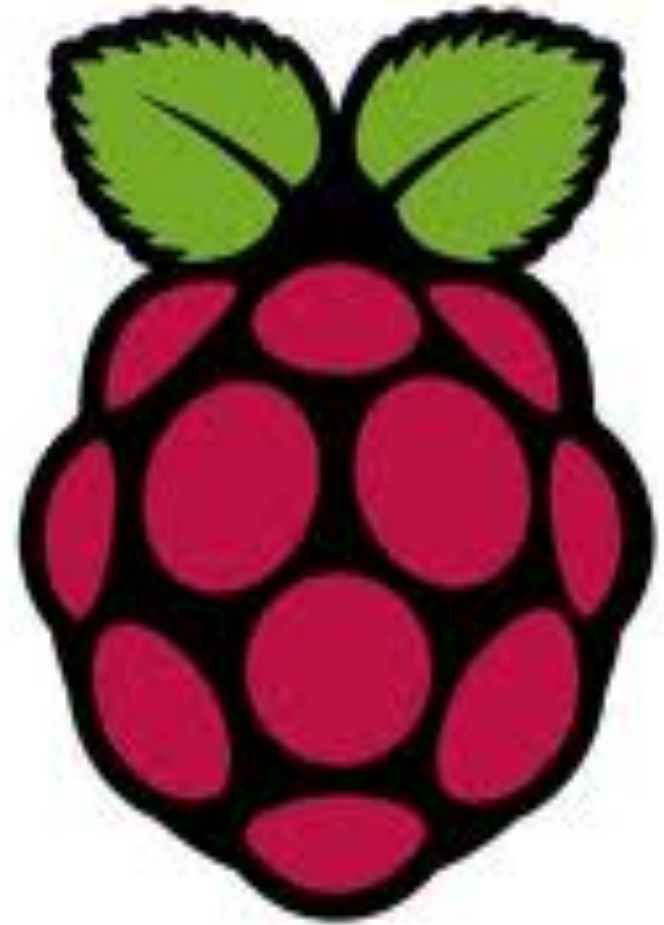


Image copyright raspberrypi.org

# Who Are You?

**Elementary  
Classroom  
Teacher**

**Middle School  
Classroom  
Teacher**

**High School  
Classroom  
Teacher**

**Librarian**

**Tech Integrator**

**Tech Director**

**Member of a  
Tech Services  
Department**

**Technology  
Teacher**

**Tech Services  
Staff Member**

**Computer Club**

**Preservice  
Teacher**

**Central Office  
Administrator**

**Building  
Principal**

**Member,  
Board of  
Education**

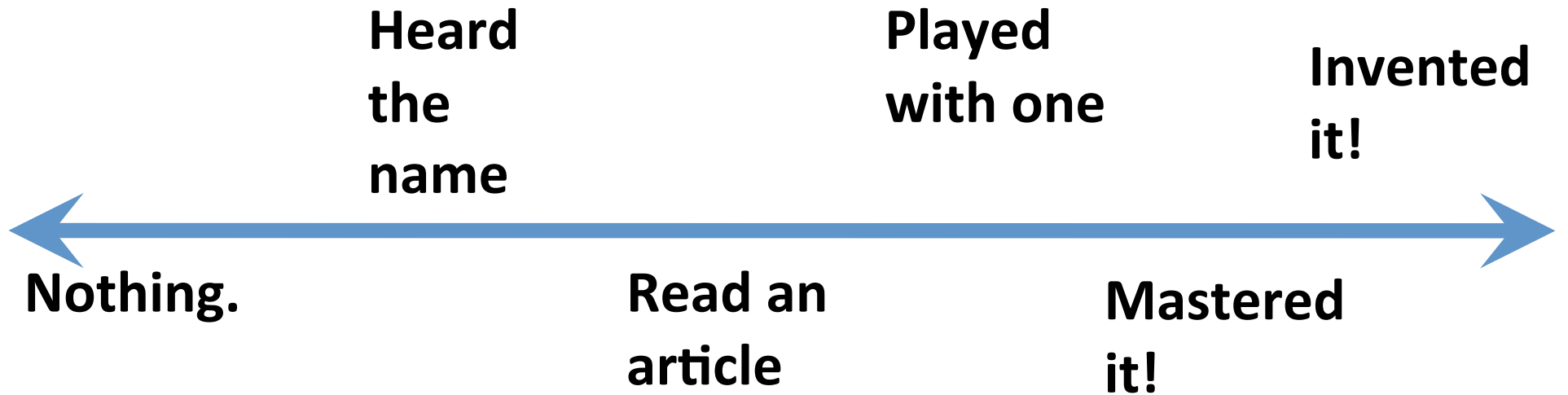
**Other**



Kristin Fontichiaro

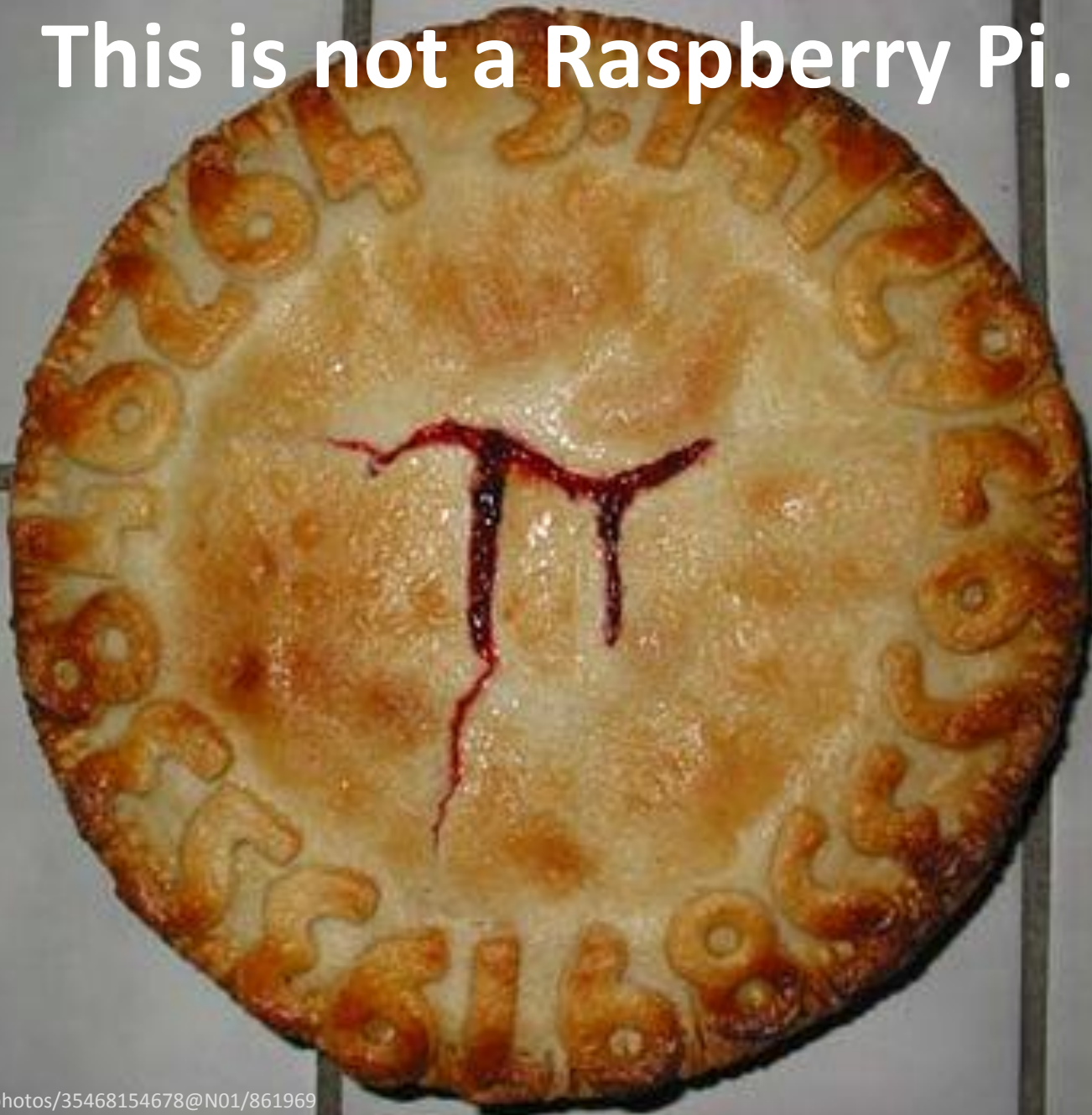
# Overview of Raspberry Pi

# How Much Do You Know About Raspberry Pi already?





This is not a Raspberry Pi.





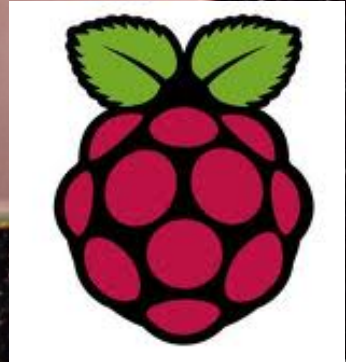
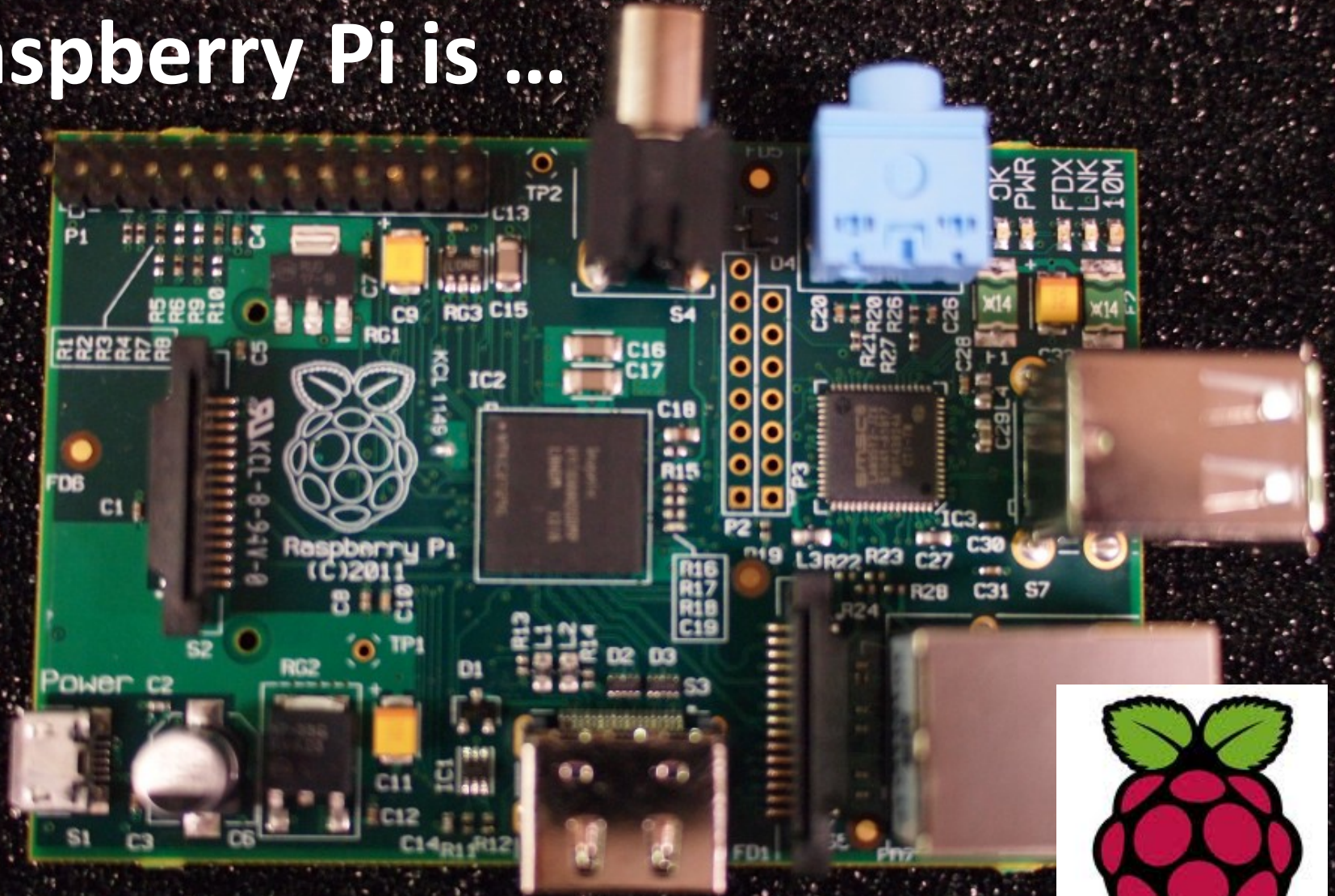
**2006:**

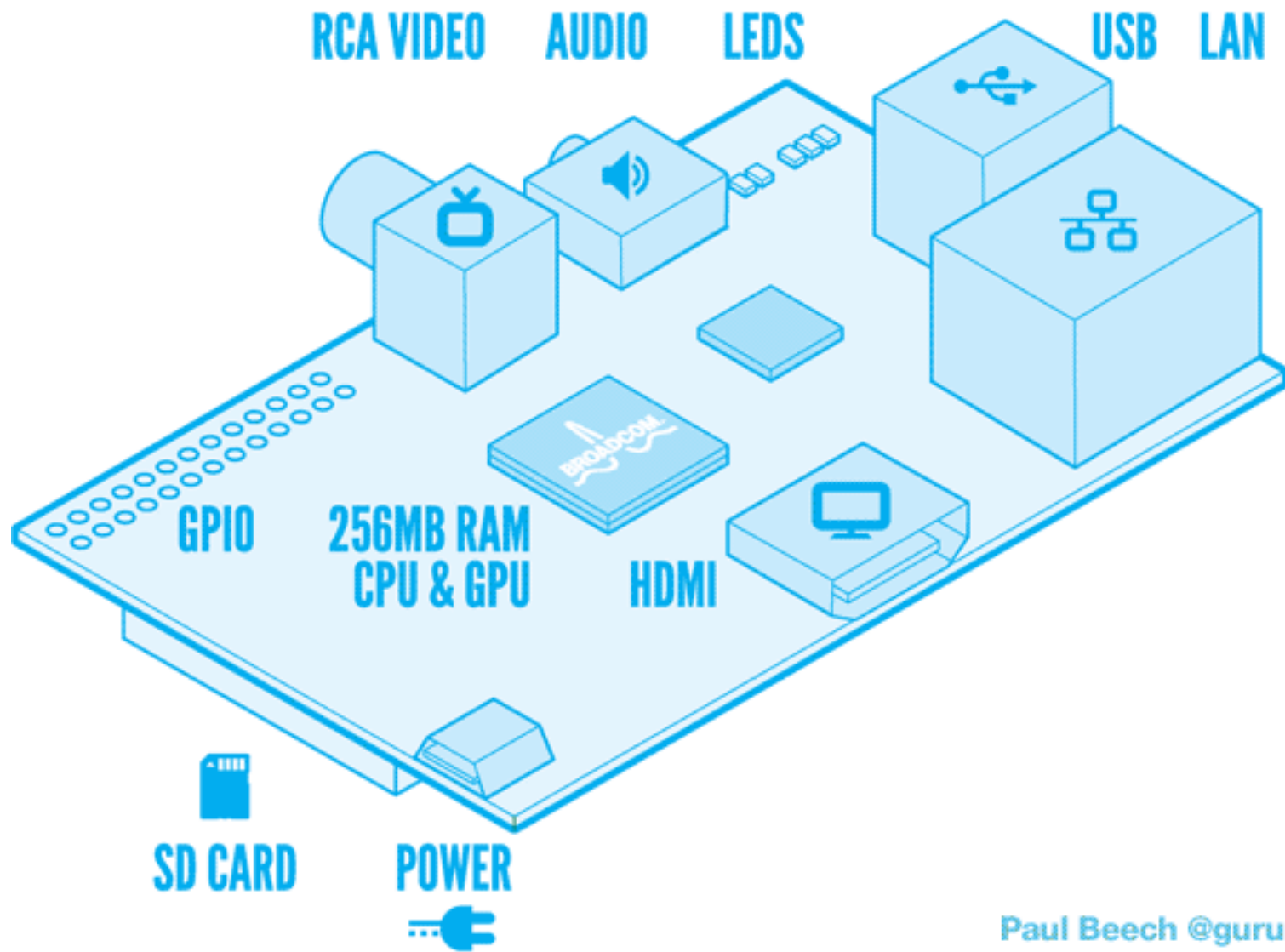
**In the UK, we don't have enough students coming to computer science programs who can program.**

**They can use computers, but they don't have programming experience. This is a problem.**

Image: 'Fresh raspberries'  
<http://www.flickr.com/photos/62528187@N00/272567650>

Raspberry Pi is ...



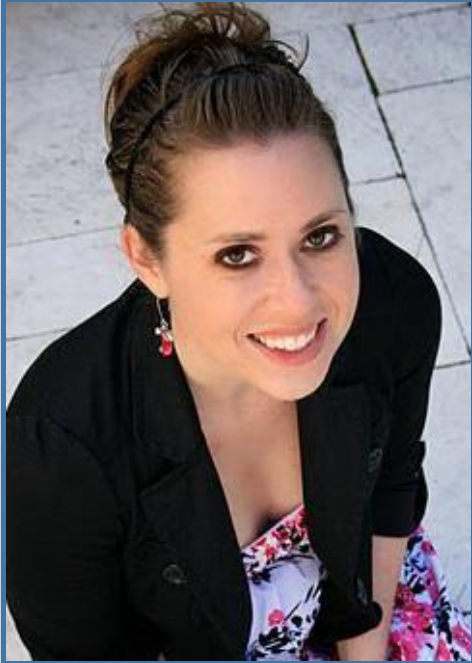


This image and that on previous screen from Raspberry Pi.org/faqs

**So all of this got us thinking about  
stuff far beyond a  
\$35 device...**



- Is it problematic to have a generation of kids who can only **use (read)** the Web and software?
- Is it important for the next generation to **code (write) and create** their own programs?
- Are there kids who are **marginalized** in the current education system but code after hours?

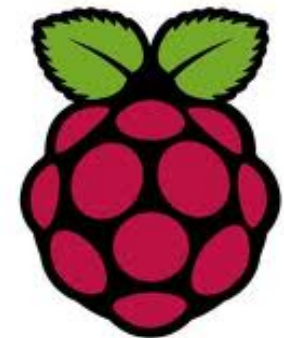


Sam Roslund

# Have Kids Forgotten How To Be Creative?

# Why is RaspberryPi important to our students' creativity?

- Memorizing facts for standardized testing
- Creating suffers in our current model
- Tools like RPis, Arduinos, MakersSpaces, etc. can help to bring back the desire to “make”







# FAILURE

It takes a lot of work sometimes

# Failure and Learning

- Many scholars have researched the positive influence of failure
- Singapore study on problem solving in schools
  - Students with scaffolding underperformed those who were left to “struggle”

# How Many of You Were Encouraged to Fail?

Failure was tacit  
and, therefore,  
positive

Failure was not  
an option

Failure  
sometimes  
happened, it was  
"okay"



# Learning by Authority vs. Learning Creatively

- By Authority: told what to learn and accept the information as implicit (failure discouraged)
- Creatively: question what you are learning, explore curiosity (failure encouraged)
- “learn, memorize, rehearse, repeat” stifles creativity
- Even “aimless” play is good

Lin, Y. (2011). “Fostering Creativity through Education-A Conceptual Framework of Creative Pedagogy.” *Creative Education*, 2(3), 149-155.

Tang, J.C. ( April 5, 2011). “Let Preschoolers Play!” The Newsweek/Daily Beast Company LLC. Retrieved from:  
<http://www.thedailybeast.com/articles/2011/04/05/academic-benefits-to-play-during-early-childhood-education.html>

# MakerSpaces & Making



Image: "MakerSpace"  
<http://www.flickr.com/photos/memakerspace/5832326991/>

# How can we teach creatively?

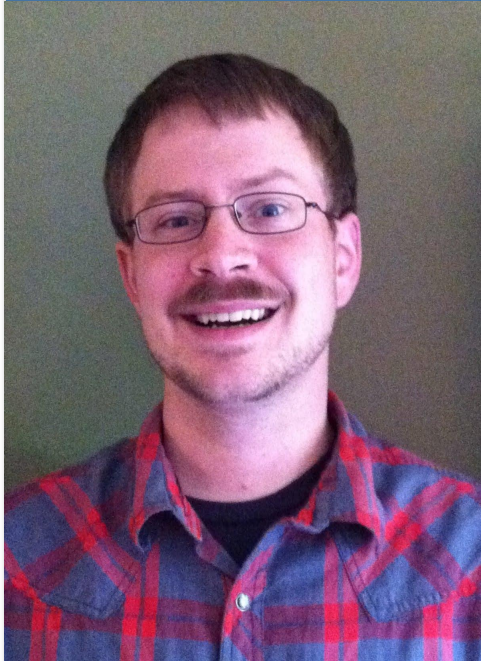
- British NACCCE gives three examples
  - Believe in creative potential
  - Identify strengths
  - Enhance creativity

NACCCE. (1999). National Advisory Committee on Creative and Cultural Education: All our Futures: Creativity, Culture and Education. London: DFEE.

**Eben Upton,  
RaspberryPi  
Founder, shows a  
student how to  
use his Raspberry  
Pi computer**



<http://www.telegraph.co.uk/technology/news/9203796/Raspberry-Pi-delivered.html>



Terence O'Neill

So How Do You Teach This?

\$5



\$60



\$25



\$5



\$5





# Three Ways the RasPi is Awesome and Different, and Some Classroom Applications

1. Video/Sound Output Capabilities

2. RasPi is Portable

3. Lowers the Price Point

# Video Capabilities

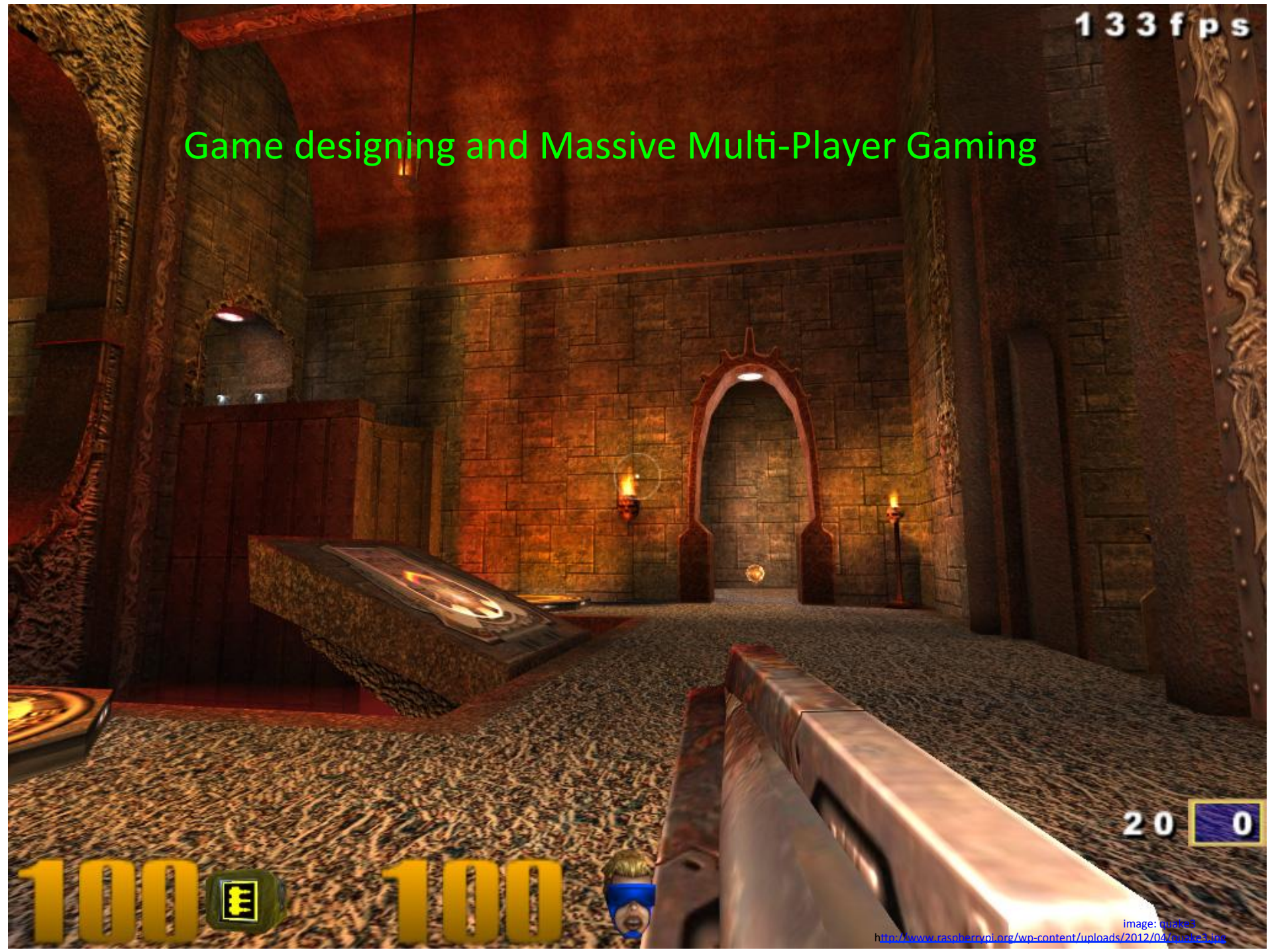
Use RasPi as a personalizable computer for students to learn programming on

Create basic video games through SCRATCH,  
pygame

Allows for students to understand hardware/  
software interactions

133 fps

# Game designing and Massive Multi-Player Gaming



# Portable Computing Power

Using the RasPi to  
control robots

Only needs  
Power, Input, Output

Combine with basic  
programming of  
SCRATCH, pyGame

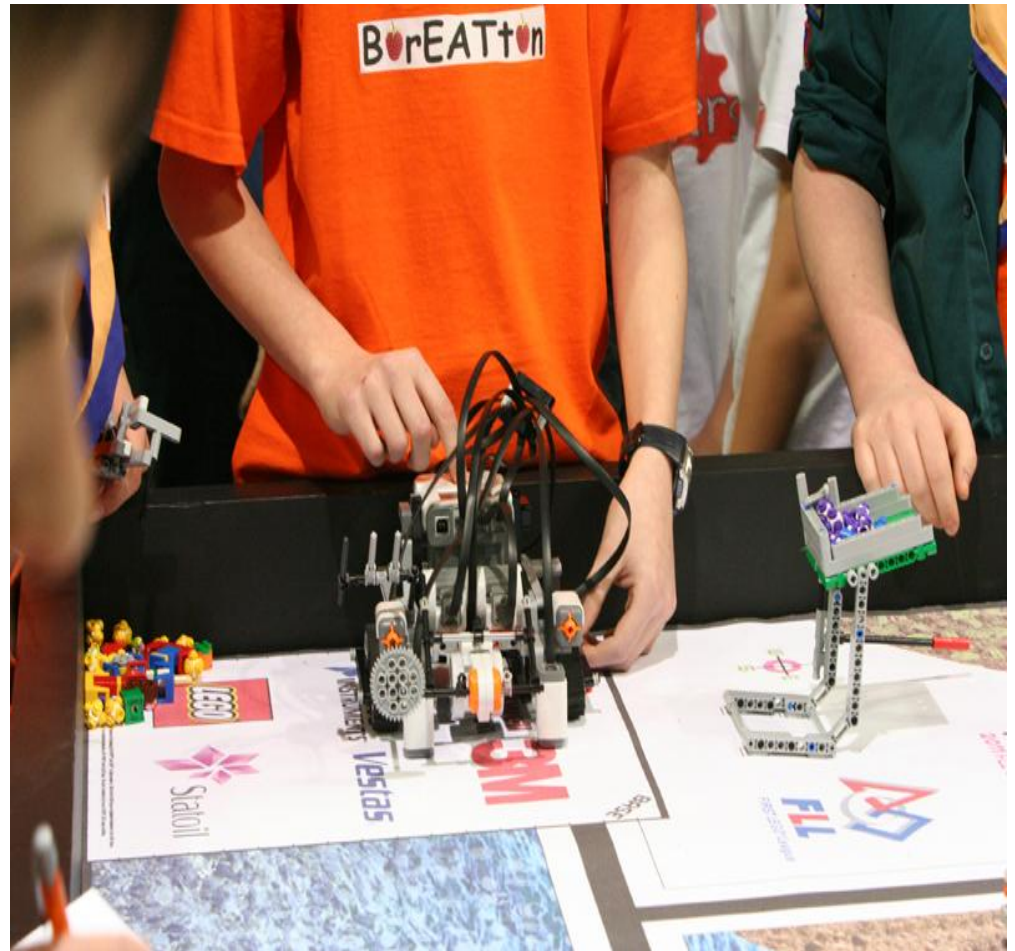


Image: "Bert 5e-our-robot"

<http://www.raspberrypi.org/wp-content/uploads/2012/05/BERT5e-our-robot.jpg>

## Other Applications

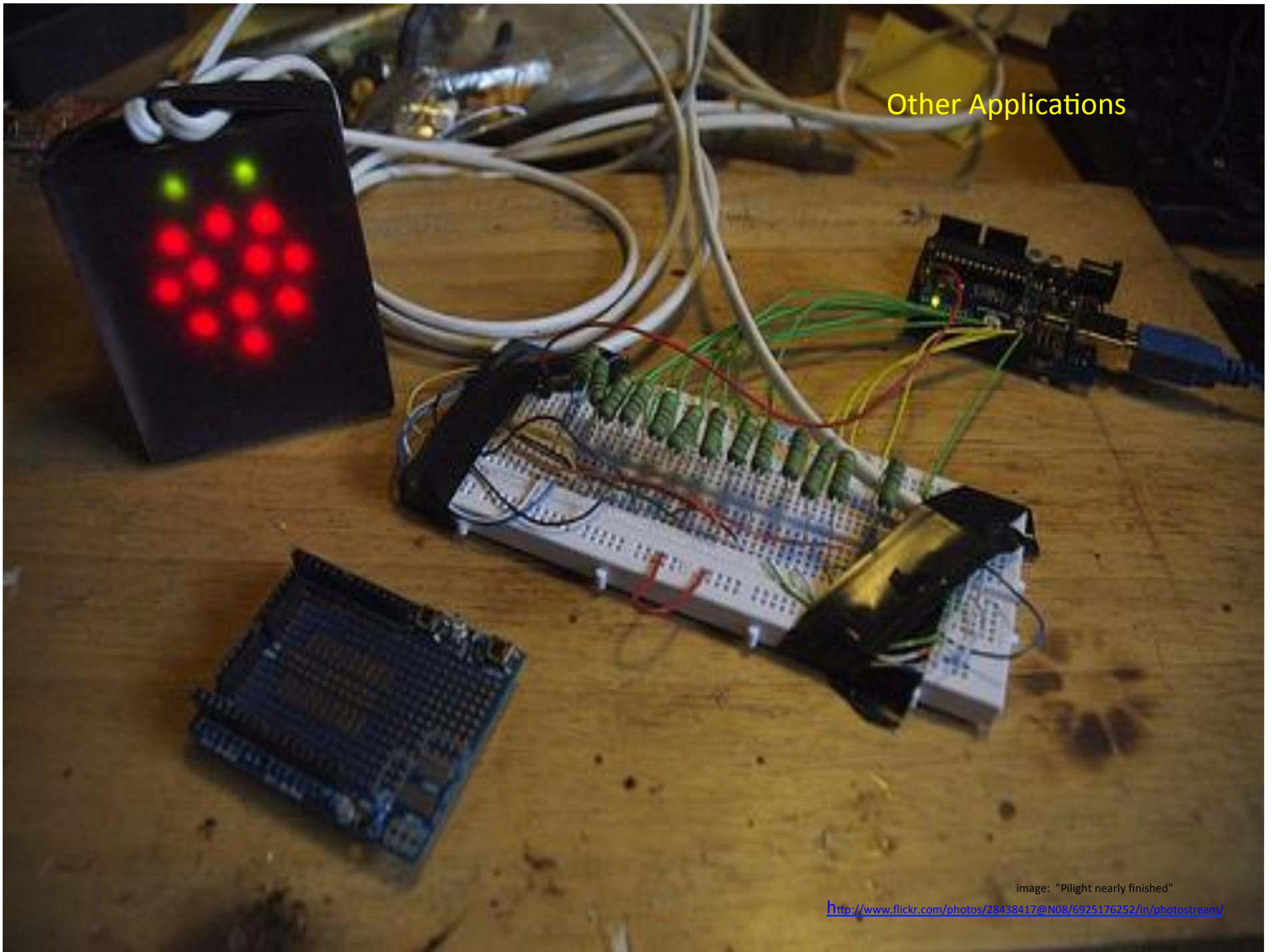


image: "Pilight nearly finished"

<http://www.flickr.com/photos/28438417@N08/6925176252/in/igphotostream/>

# Lowering the Price Point

Indian company expEYES:  
Simple sensors plus RasPi  
equals science experiments:

- Electromagnetic Induction
- Conductivity of Water
- Camera coming soon!

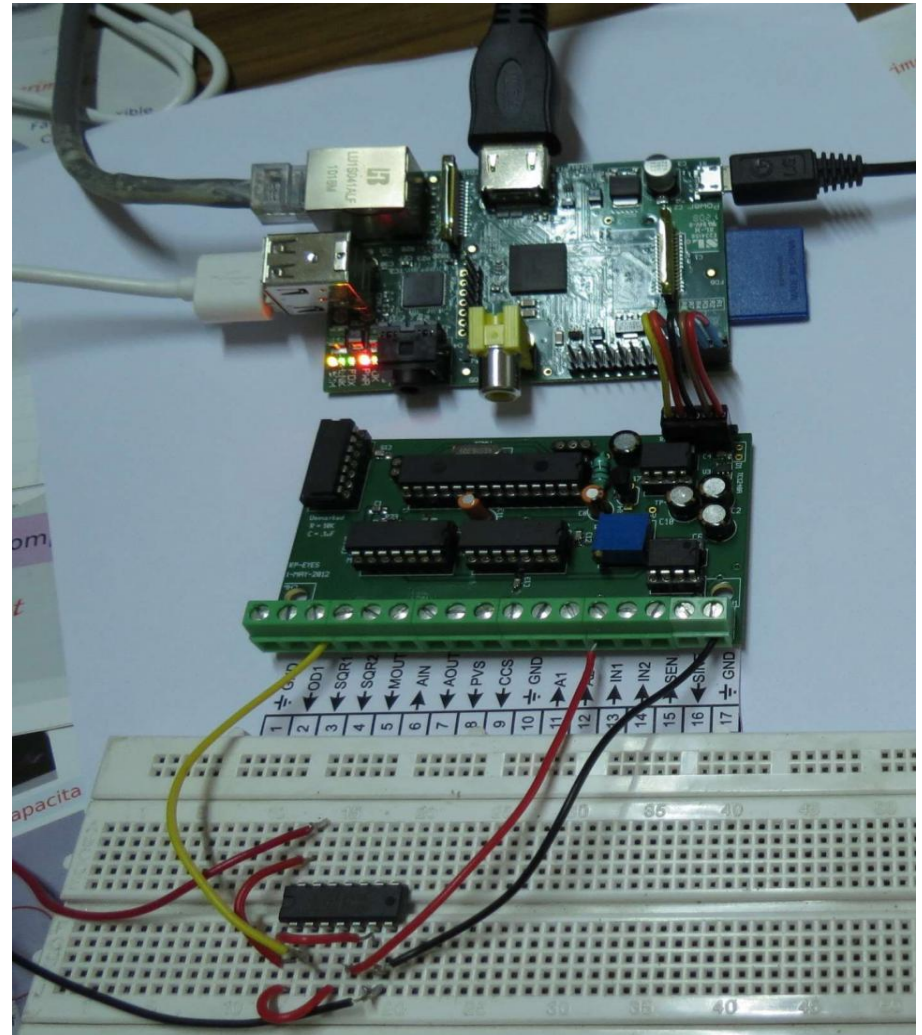


image: eyes4pi\_without\_cover

[http://www.raspberrypi.org/wp-content/uploads/2012/05/eyes4pi-without-cover\\_small.jpg](http://www.raspberrypi.org/wp-content/uploads/2012/05/eyes4pi-without-cover_small.jpg)

Image: 'raspberries'

<http://www.flickr.com/photos/21404006@N00/217468630>

**How would *you*  
use RasPi?**

# Coming Resources

- Rubus: Classroom in a box
- Computing at School
- Raspberry Pi YouTube Channel





Shauna Masura

Welcome to the Movement

Consider a hypothetical group of  
middle school boys

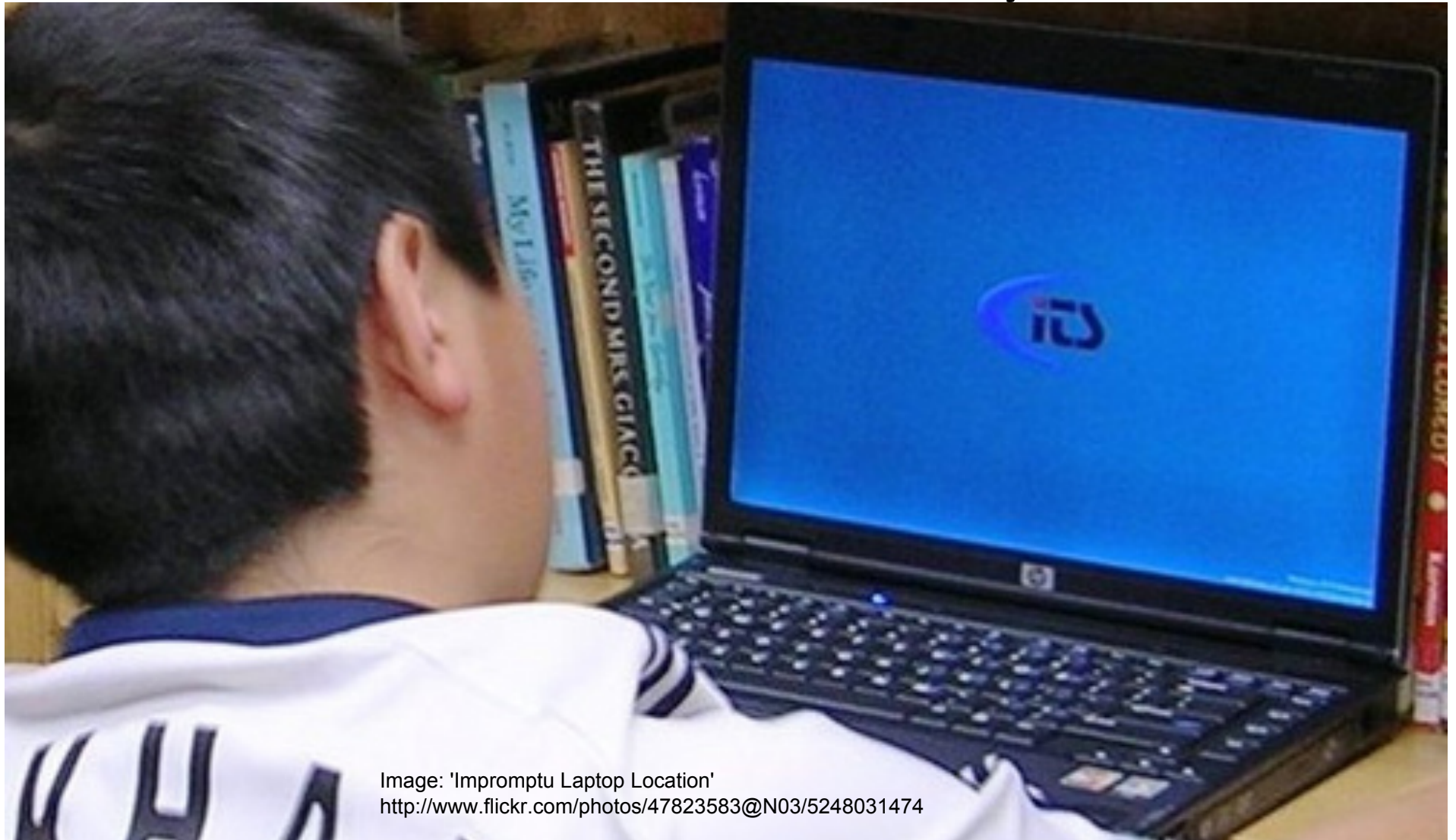


Image: 'Impromptu Laptop Location'  
<http://www.flickr.com/photos/47823583@N03/5248031474>

- 
1. How can we best facilitate these informal environments so they are more interactive?
  2. How can we develop credentials for the learning that happens there?

Image: 'I wanted all of them.'  
<http://www.flickr.com/photos/77343377@N00/3708775178>



# Enter Badges



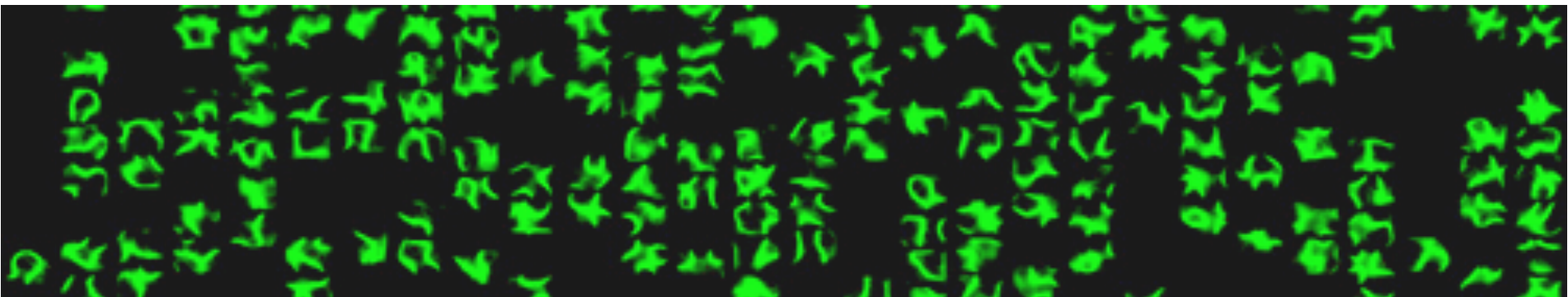
# What would happen if we let kids decide...

- what they want to learn
- what it will take to learn something
- how they will know once they've learned it

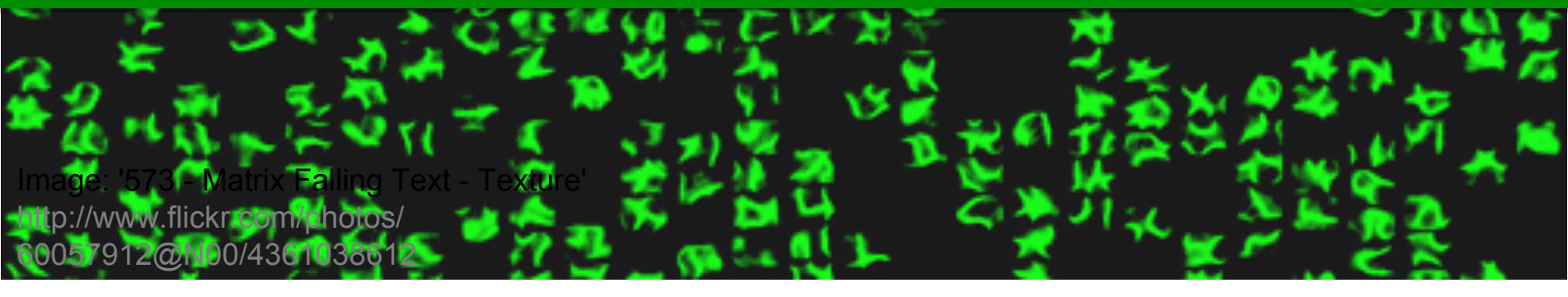
## Discuss in the chat box:

Where does that leave the adults who have been trained to do all of this stuff?

What does a teacher's role look like in this environment?



**Technology has the power to  
make learning more  
individualized, interest-focused,  
and interactive than it could be  
otherwise**



# Get Started On Your Raspberry Pi Journey!



Image: 'maze'  
<http://www.flickr.com/photos/73645804@N00/2786241330>



This is about an international, open-source  
community of explorers and sharers.



We're excited.

# raspberrypi.org

## Raspberry Pi

An ARM GNU/Linux box for \$25. Take a byte!



[Home](#) [About us](#) [Contact us](#) [Downloads](#) [FAQs](#) [Quick start guide](#) [Trademark rules](#) [Forum](#) [Wiki](#)

### Easy firmware updating tool from Hexxeh 7

Posted on [May 10, 2012](#) by [liz](#)

Hexxeh has been hard at work doing development with his Raspberry Pi, and has had to reinstall the firmware onto a blank image quite frequently. So he's written a tool to do it for him; and it'll work for you too. If you're not a developer, his [rpi-updater](#) is still something you might want to download, just in order to make sure you always have the latest firmware and kernel version for your Raspberry Pi.

Head over to Hexxeh's blog for a [download link and instructions](#).

SEARCH THIS SITE

Google™ Custom Search

Google search

WHERE TO BUY

element14  
powered by Premier Farnell



# newark.com



## Product Search

  [RoHS compliant](#) | [Advanced Search](#)[Logout](#) | [Contact Us](#) | [Help](#) [Change Co](#) **Shopping Cart: \$0.00 (0 I**[HOME](#) | [PRODUCTS](#) | [SERVICES](#) | [SOLUTIONS](#) | [COMMUNITY](#) | [ORDER](#) | [MY ACCOUNT](#) | [LIVE SUPPORT](#)

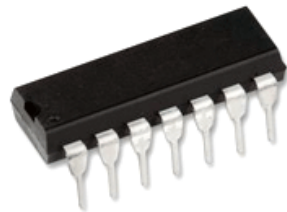
A Premier Farnell C

[New to Newark/element14? Start here](#)Welcome **Kristin Fontichiaro**, if you are not **Kristin Fontichiaro** [cli](#)

### PRODUCTS

[New Products](#)[Manufacturer List](#)

- [Automation & Process Control](#)
- [Batteries & Chargers](#)
- [Cable, Wire & Assemblies](#)
- [Chemicals & Adhesives](#)
- [Circuit Protection](#)
- [Connectors](#)
- [Crystals & Oscillators](#)
- [Electrical](#)
- [Enclosures, Racks & Cabinets](#)
- [Fans, Heat Sinks & HVAC](#)
- [Fasteners & Mechanical](#)
- [Office & Computer](#)
- [Optoelectronics & Displays](#)
- [Passive Components](#)
- [Power & Line Protection](#)
- [Security & Audio Visual](#)

**WEEKLY SPECIALS...Sale Ends Soon!****08 D 09 H 37 M 44 S****Save 10%**

## On All Amplifiers & Converters

Save on all top brands at Newark element14

Offer expires: 5/18/2012

[View Products](#)[Welcome](#)[Buying Tools](#)[Our Story](#)

### Top Products In-Stock Now!

### Quick Buy

Newark Part Number	Qty
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

**We've Reduced Prices**

**on thousands of products**

Check out products by these manufacturers:

**Texas Instruments (4100+)**

ISSUE 01 MAY 2012

# The MagPi

A Magazine for Raspberry Pi Users

- *RacyPy*
- *Debian*
- *Scratch*
- *Python*

Introducing...  
The  
Raspberry Pi

A new breed of  
computer.

**NO MORE  
APPLES  
FOR  
TEACHER!**

QR Code:



<http://www.themagpi.com>

Raspberry Pi is a trademark of The Raspberry Pi Foundation.  
The Cover and Frontback design were created using MagPi 01, Issue 001.

**themagpi.net**

Image: 'Raspberry Girl'  
<http://www.flickr.com/photos/40646519@N00/6552932967>



<http://bit.ly/rpi-links>





**Please take our evaluation... and if  
you take a byte of Raspberry Pi,  
share your stories with us!**

**<http://bit.ly/4t-raspi>**

**[raspberrypi@umich.edu](mailto:raspberrypi@umich.edu)**