



ENCONTROS PLAN DE MELLORA DE BIBLIOTECAS ESCOLARES 2018/ 2019

# Biblioteca creativa.

## Educación maker máis aló da robótica

Paola Guimeráns

*Especialista en educación na área dos e-téxtiles  
Doutora pola Universidade Complutense de Madrid*

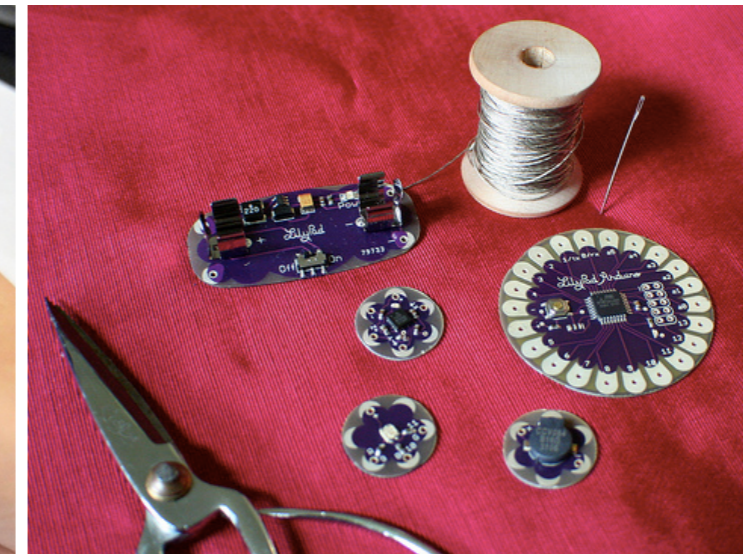
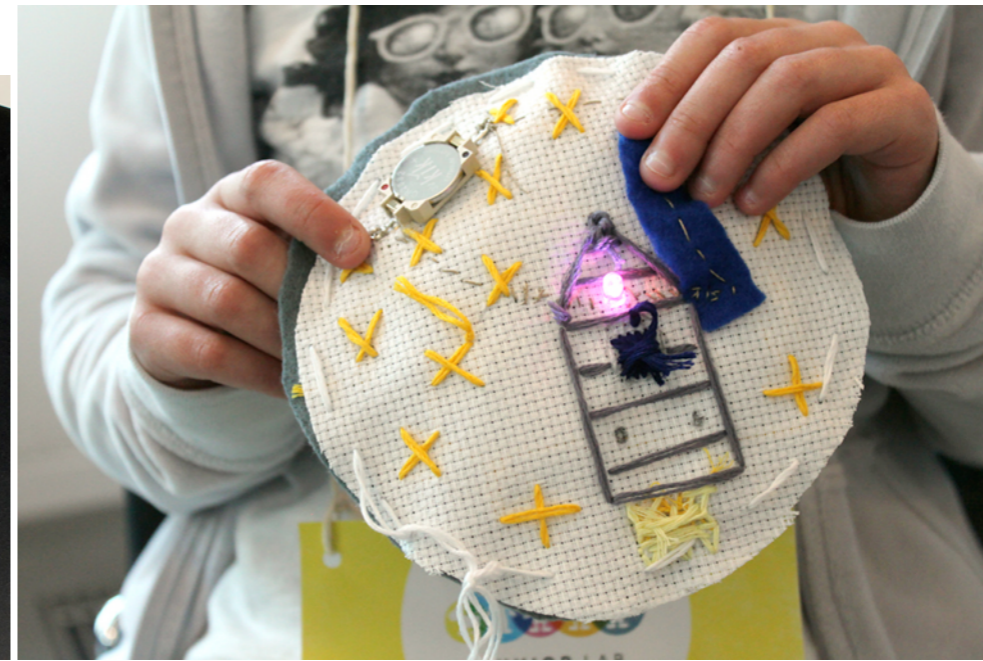


## Educación Superior e Master



Dende o ano 2011 imparto cursos vinculados co ámbito dos E-téxtiles, O fin último destes radica en que estudantes universitarios examinen un espectro de novos materiais e procesos para construír, deseñar e implementar prototipos electrónicos, que sexan á vez estéticos e funcionais.

## Novos materiais e ferramentas dixitais DIY

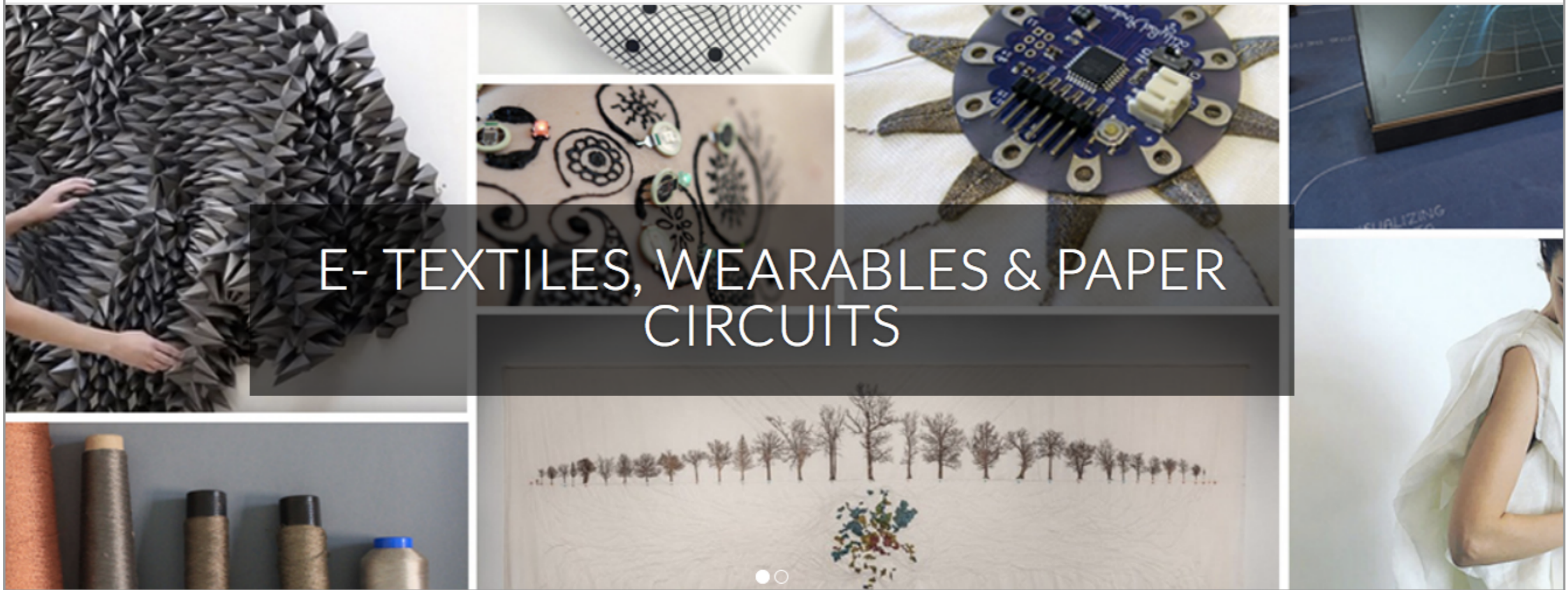


prototipadoLAB

Plataforma de recursos para la creación de E-textiles, Wearables y Paper Circuits



LA IDEA   HERRAMIENTAS   MATERIALES   SENSORES & ACTUADORES   TUTORIALES / HAZLO TÚ MISMO   MAGAZINE   → CURSOS Y CLASES





## PARSONS EXPLORES NEXT FRONTIER IN WEARABLE TECHNOLOGY

Functional Aesthetics Symposium and Book Launch on November 19

NEW YORK, November 16, 2010—On November 19, Parsons The New School for Design will present Functional Aesthetics, a symposium, book launch, and electronic paper workshop that celebrates the next wave of design merging textiles and technology. The series celebrates the launch of the Fashionable Technology Lab at Parsons, a research center that explores the intersection of design, technology, science and fashion.

"We live in a world that is extraordinarily dependent upon technology, and it is up to designers to harness the power of technology to create functional, aesthetically pleasing work," said Sabine Seymour, assistant professor of Fashionable Technology at Parsons and director of the lab, whose research focuses on functional aesthetics in fashion, media, and technology. "Through this series, we will illuminate the current landscape of projects that utilize technology in innovative ways."

The symposium, which will be held from 2-5 p.m. in the Anna-Maria and Stephen Kellen Auditorium, will feature presentations by a series of designers whose projects blend form and technology in innovative ways. This includes Stacey Burr, a pioneer in the field of electrotexiles, who will discuss Adidas Wearable Sports Electronics; Jessica Floeh, an alumna of the MFA Design + Technology program at Parsons, presenting her thesis project Hanky Pancreas, a fashion line for diabetics that integrates their medical devices as fashionable accessories; Pascale Catzen, a Parsons faculty member whose



COMMUNICATIONS  
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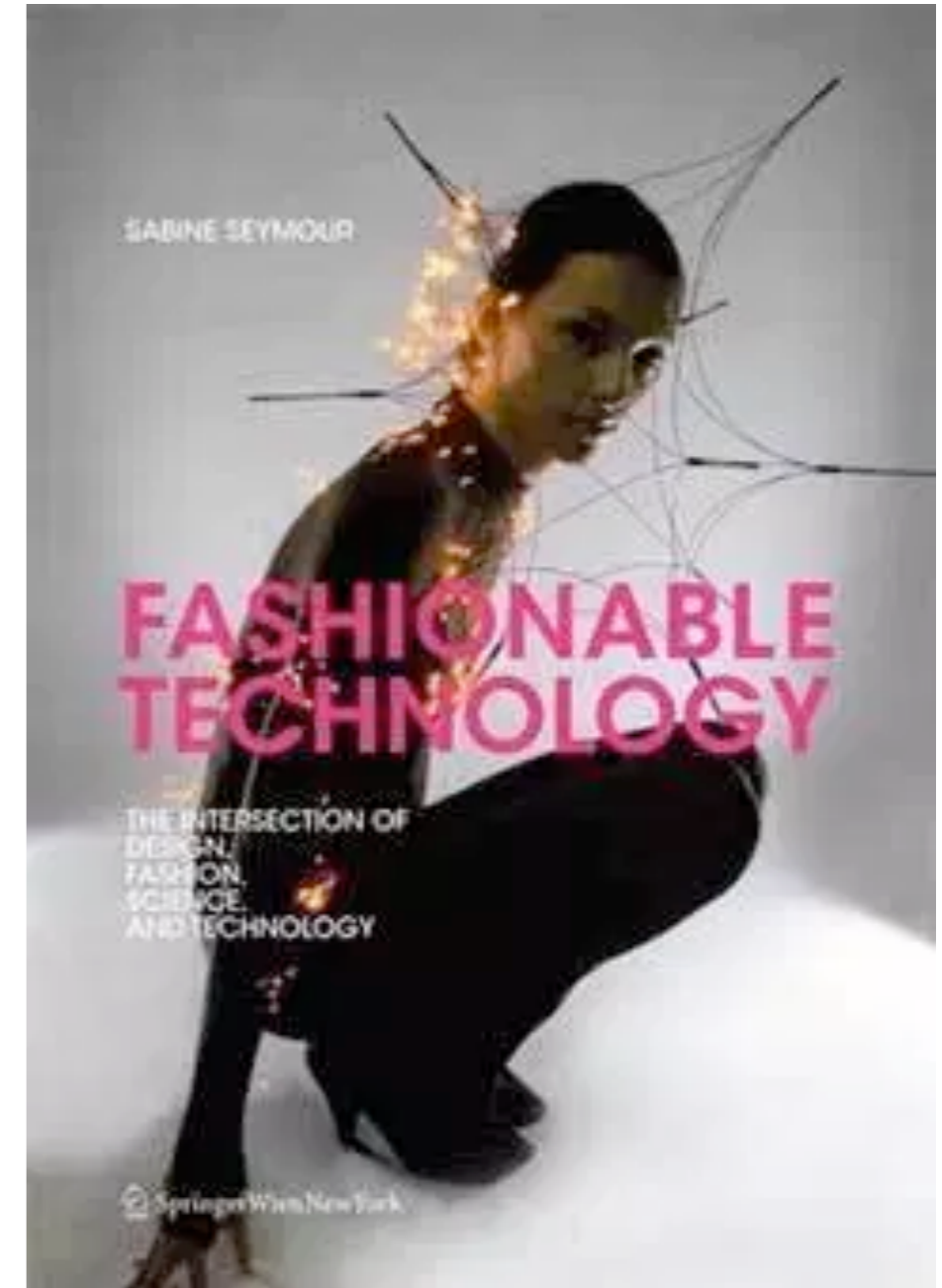
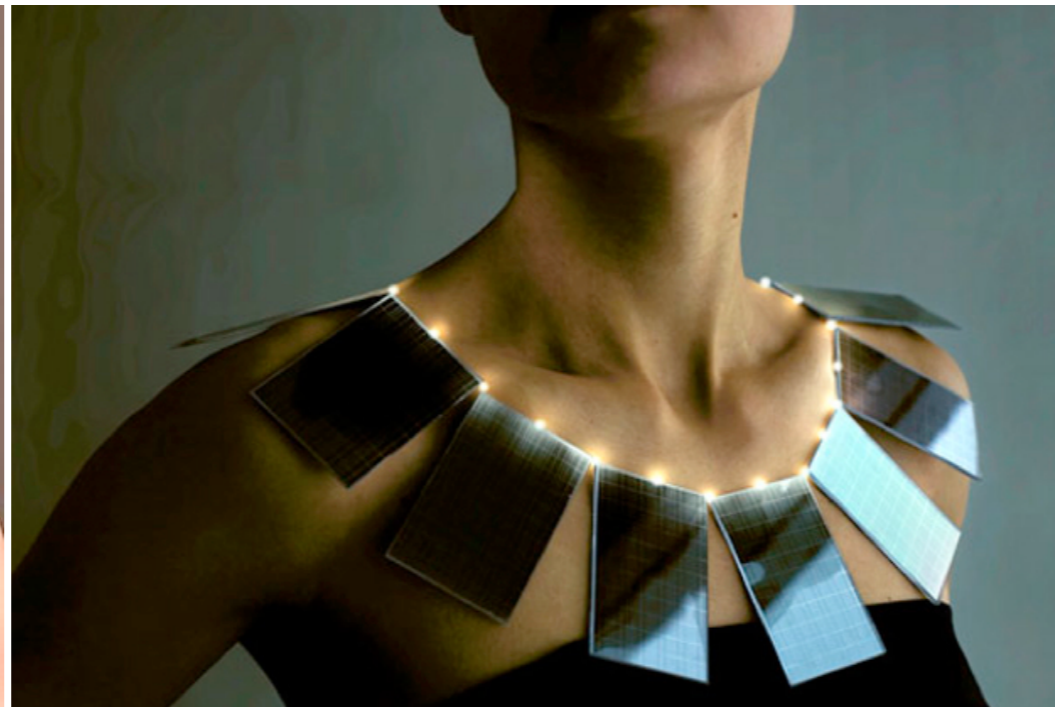
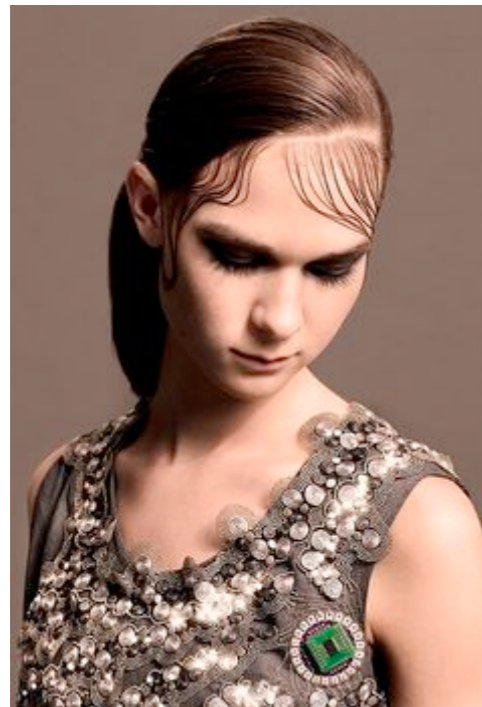
PRESS RELEASE

Media Contacts:

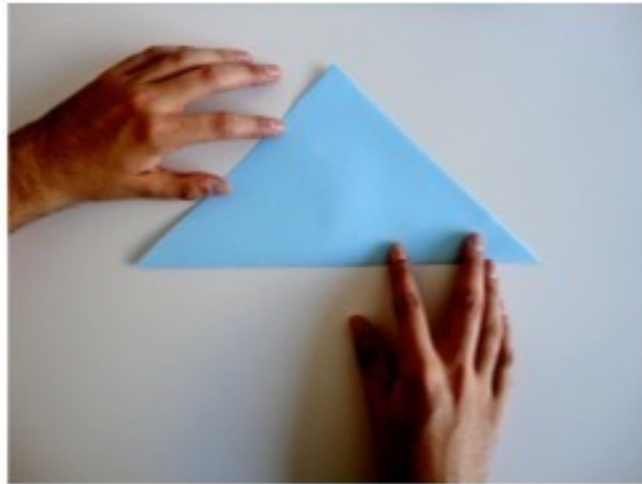
Kate McCormick  
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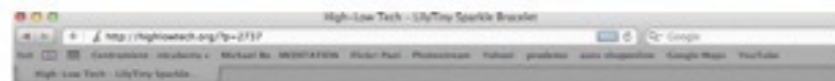
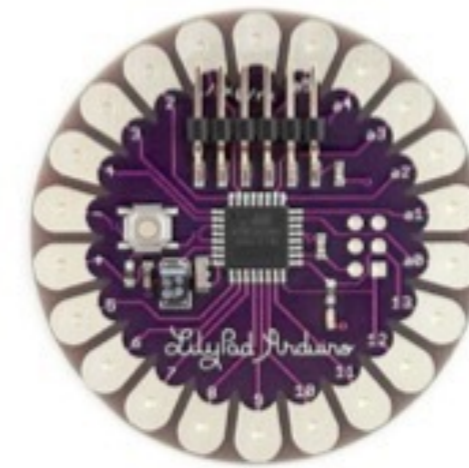
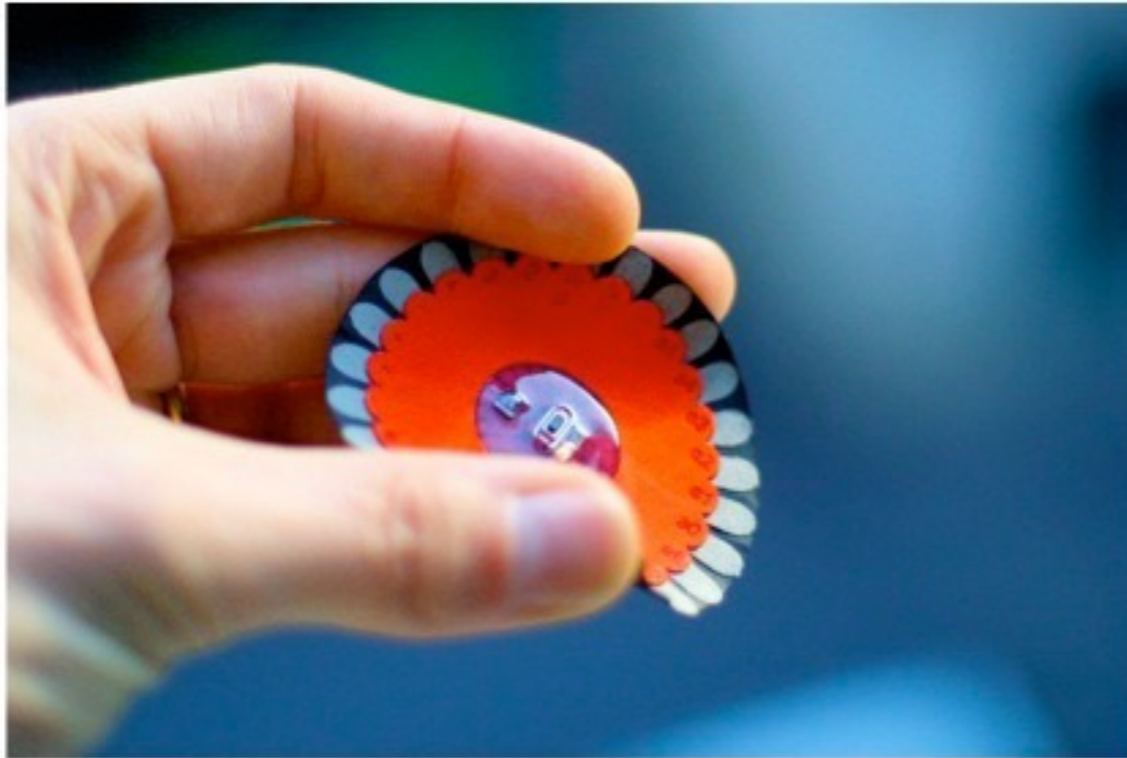
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## Integración electrónica en papel ou téxtil



# Integración electrónica en papel ou téxtil





# Novas tendencias dixitais en educación superior

**PARSONS**  
THE NEW SCHOOL  
FOR DESIGN



Collab: Soft Circuits | Spring 2011

http://softcircuits2011.wordpress.com/

Syllabus Materials Readings Lectures Resources

## Collab: Soft Circuits

Spring 2011

### PopUp Power

By the author  
May 19, 2011 // 1

Well, our workshop was super successful if you don't count the lack of students. We only had one sign-up and he didn't show for the actual event. We ended up playing with the nInol a bit and talking to Paola about how to adapt it for kids. Here are some images from what we made:





# CULTURA MAKER

**DIY on the Rise!**  
 Around 70,000 people headed to New York Maker Faire last year, up from 50,000 in 2012. Out of those, 47% were new attendees.

**HELLO NEW YORK!**

**Show & Tell!**  
 With its two flagship fairs in San Francisco and New York, and 86 worldwide mini-fairs, Maker Faire had 280,000 attendees in 2013.

**Make Magazine** subscriptions are up to 125,000 and growing by 20% a year.

**PUMP IT UP!**  
 Makers fuel business with some \$29 billion into the economy each year. (USA Today)

**Etsy** JUST PUT YOUR NAME ON IT!  
 Etsy has 875,000 shops; 13,000,000 items; 2,900,000 items sold per month. (BirRebels) There are 15 million Etsy DIYers in over 150 countries with 690,000 new members joining every month.

**K** Since Kickstarter's 2009 launch, more than \$116 million has been raised for more than 1,400 technology-related projects, of which the majority have been hardware gadgets.

**Arduino** is at the heart of the Maker Movement. Atmel is at the heart of Arduino.

**The Next Industrial Revolution**  
 Robot population vs. the actual human population... The world's robot population has reached 8.6 million. That's more than one automaton for every citizen of Austria! It is estimated that about 22 million units of service robots for personal use will be sold between 2013 and 2016.

**FLYING HIGH**  
 Aerospace growth projections: "Much of the growth in 3D printing from 2014 to 2020 will come from the healthcare and aerospace industries." (MarketsandMarkets, Nov 2013)

Approximately 135 million U.S. adults are makers  
 "People who employ their creative skills in craft activities, such as making clothing, jewelry, baked goods or works of craft or art. That's 57% of the American population age 18 and up." (USA Today)

The overall market for 3D printing products and services hit \$2.2 billion in 2012, expected to reach \$6 billion by 2017 and \$8.41 billion in 2020.

**Soccer World Cup vs. RoboCup**  
 RoboCup was set up with the aim of creating a team of humanoid robots that can take on and beat the best human players by 2050. The robots must act autonomously and can communicate via Wi-Fi.

**A REVOLUTION IN THE MAKING**

Atmel [www.atmel.com](http://www.atmel.com)

**Make:**  
 technology on your time

Build This Cigar Box Guitar! page 76 »

**YOUR DESKTOP FACTORY**  
 3D Manufacturing at Home  
 SPECIAL SECTION BEGINS ON PAGE 45

**21 PROJECTS YOU CAN DO**  
 » PUSH-BUTTON SPEED GAME, PADDED SWORDS, MAGIC PHOTO CUBE, SNOW GUN & MORE

**16 Must-Build Projects**

**Make:** Super-Simple Acoustic Levitator Defy Gravity!

Bre Pettit & the MakerBot CupCake CNC 3D Printer PAGE 46

**LITTLEBITS GOES A LONG WAY**  
 150 Countries and 20,000 Schools in 10 Years!

**Build Skills:**  
 » ROBOTICS  
 » COSPLAY  
 » CRAFTING  
 » WOODWORKING

**Master Calculus with 3D Printing**

5 TIPS FOR SMART KIDS

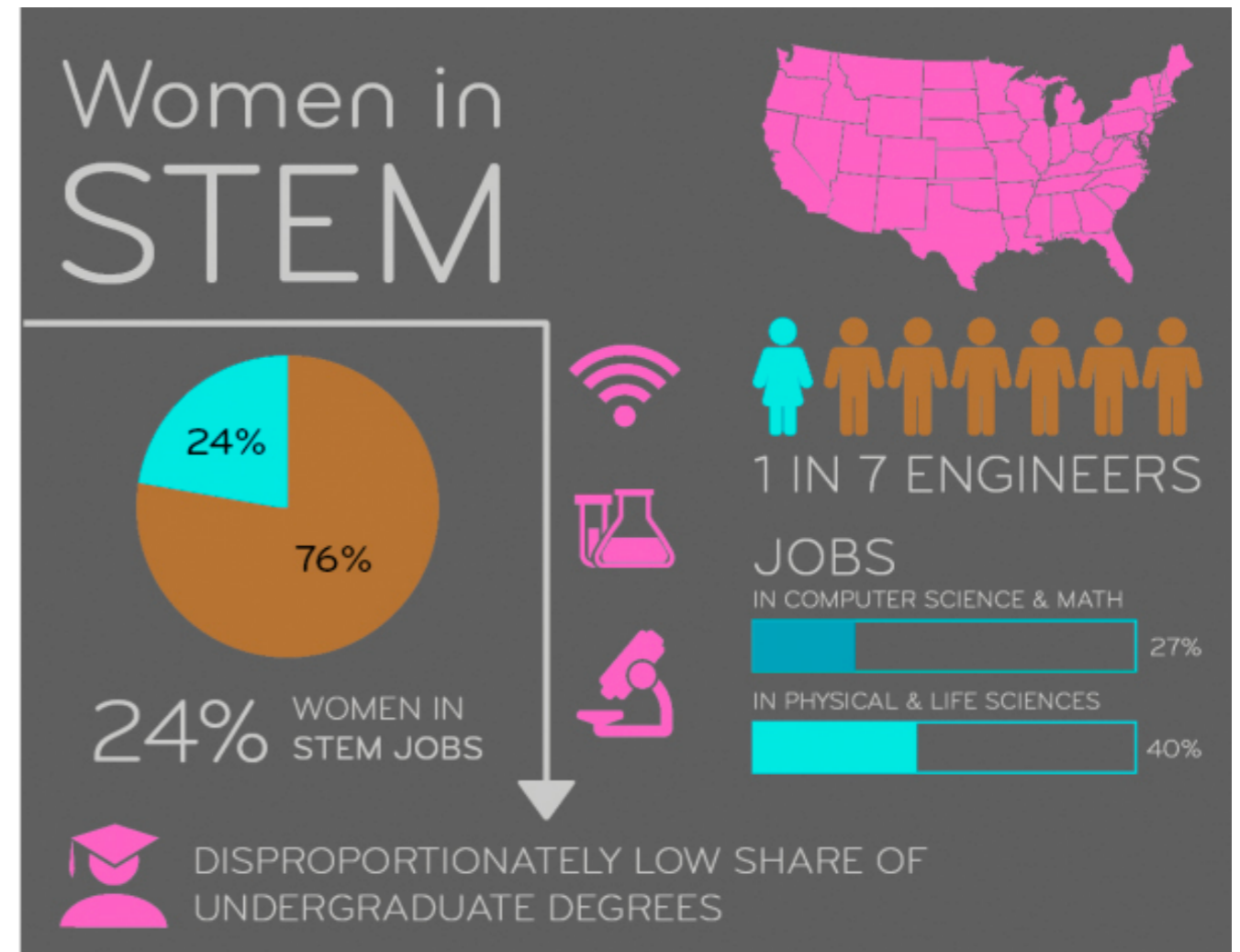
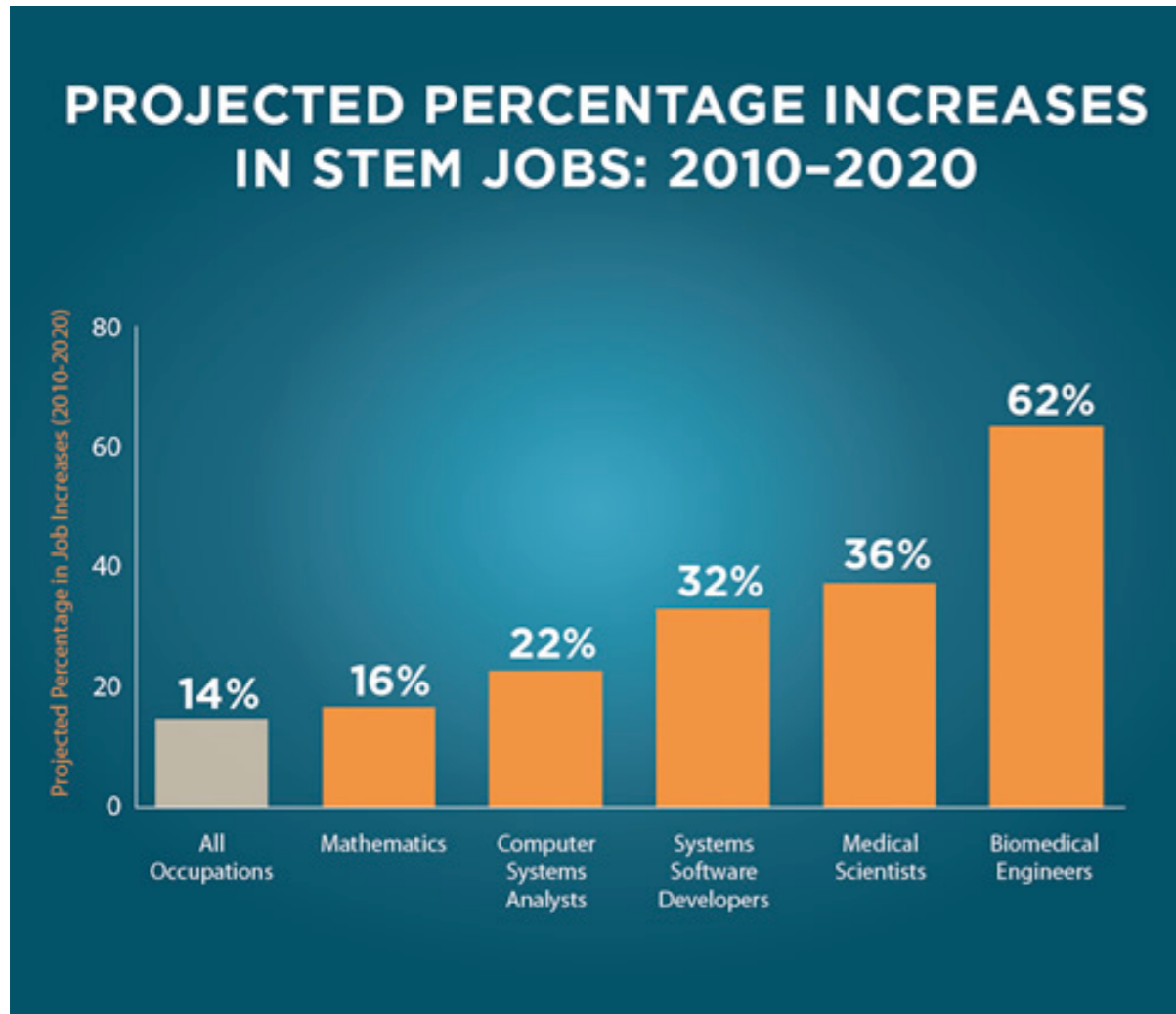
**ALSO INSIDE:**  
 Creepy Halloween Eyes  
 Sunburn Sensors  
 Debugging Your Microcontrollers  
 LED Earrings  
 And more!

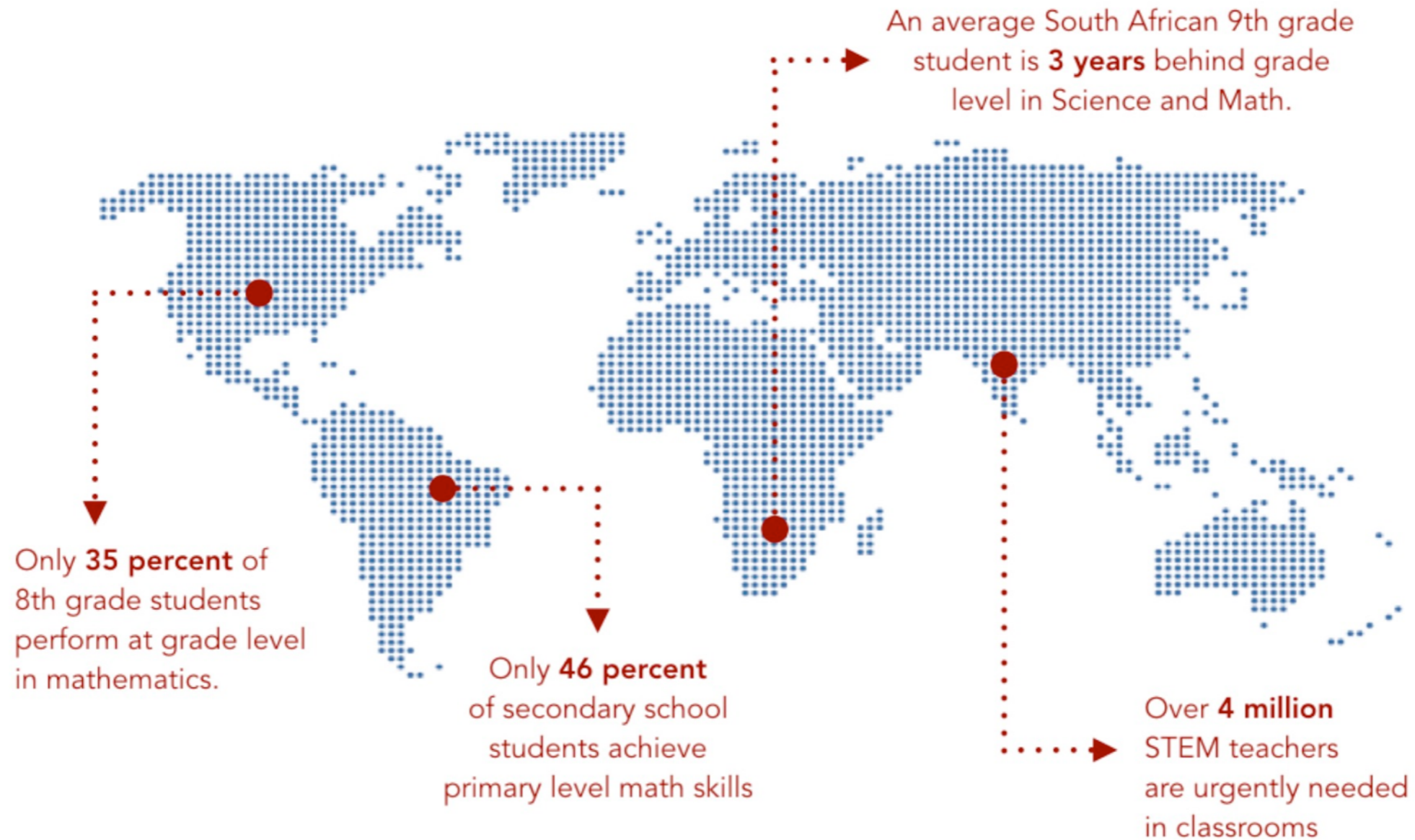
Anah Bdeir, LittleBits founder/CEO/rockstar-in-chief

makezine.com | makershare.com | makerfaire.com

Vol. 65 October/November 2018

# Equidade en STEM





Nos últimos anos, os países desenvolvidos de Europa e os Estados Unidos están promovendo a integración dos programas STEM nas escolas para fortalecer a competencia dos estudantes en investigación científica e resolución de problemas, e para prepararlos para as futuras demandas industriais.

## Deseño de programa STEAM



Kylie Pepler, Melissa Gresalfi, Katie Salen Tekinbas, and Rafi Santo  
foreword by Leah Buechley

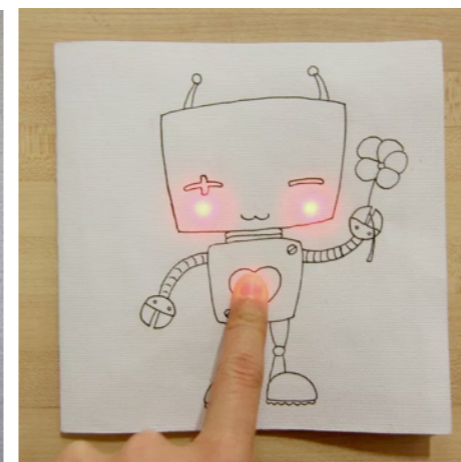
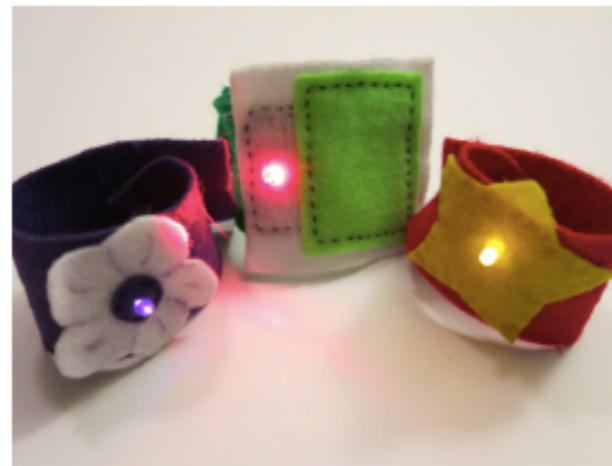
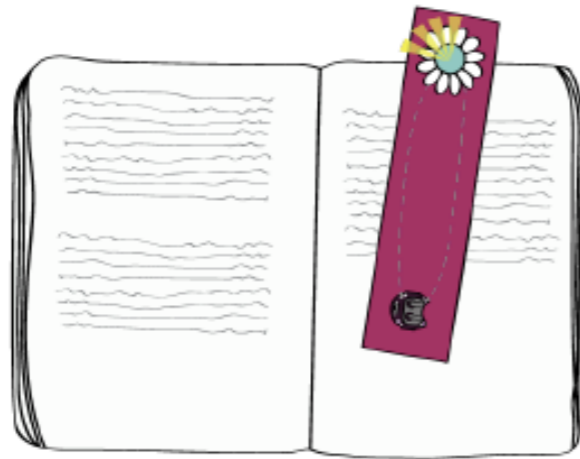


Kylie Pepler, Katie Salen Tekinbas, Melissa Gresalfi, and Rafi Santo  
foreword by Christina Conrill

*Estes libros foron creados como unha guía educativa para axudar aos docentes para incluír actividades de e-téxtiles na aula.*

## E-téxtiles e equidade en STEM

- Como podemos favorecer a incorporación do ámbito artístico nas disciplinas STEM?
- Como podemos conseguir que todo o alumnado senta que pode facer STEM?
- Como podemos garantir o interese e a participación das nenas nos estudos vinculados coas STEM?







# 2013 / CREATIVE SOFT CIRCUITS



## 2013 / Iniciativa Aula STEAM



*Aula STEAM. Paola Guimeráns, Jornada INTEF 2018/ Code Week (Instituto Nacional de Tecnologías Educativas y de Formación del Profesorado es la unidad del Ministerio de Educación, Cultura y Deporte, Madrid)*

<http://aulasteam.com/>

## 2013 / Iniciativa Aula STEAM



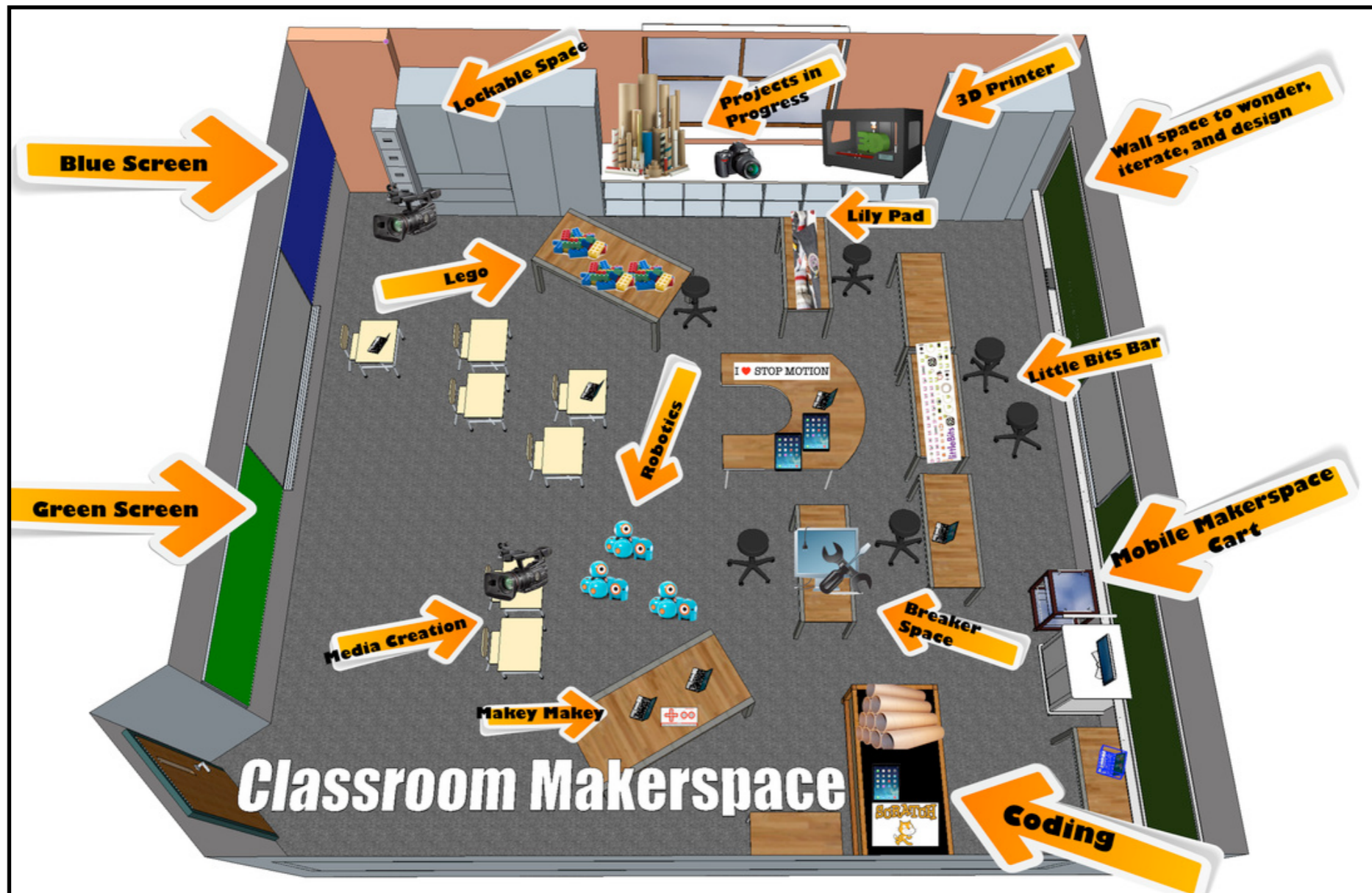
*Biblioteca PdB CEIP de Leirado*



*Biblioteca PdB CEIP  
Ponte dos Brozos*

Visibilizar e incluír no sistema educativo español estratexias de aprendizaxe baseadas en e-téxtiles, paper circuits e wearables para o desenvolvemento do talento e o fomento das vocacións científico-tecnolóxicas.

# ESPAZO MAKER



# ESPAZO MAKER

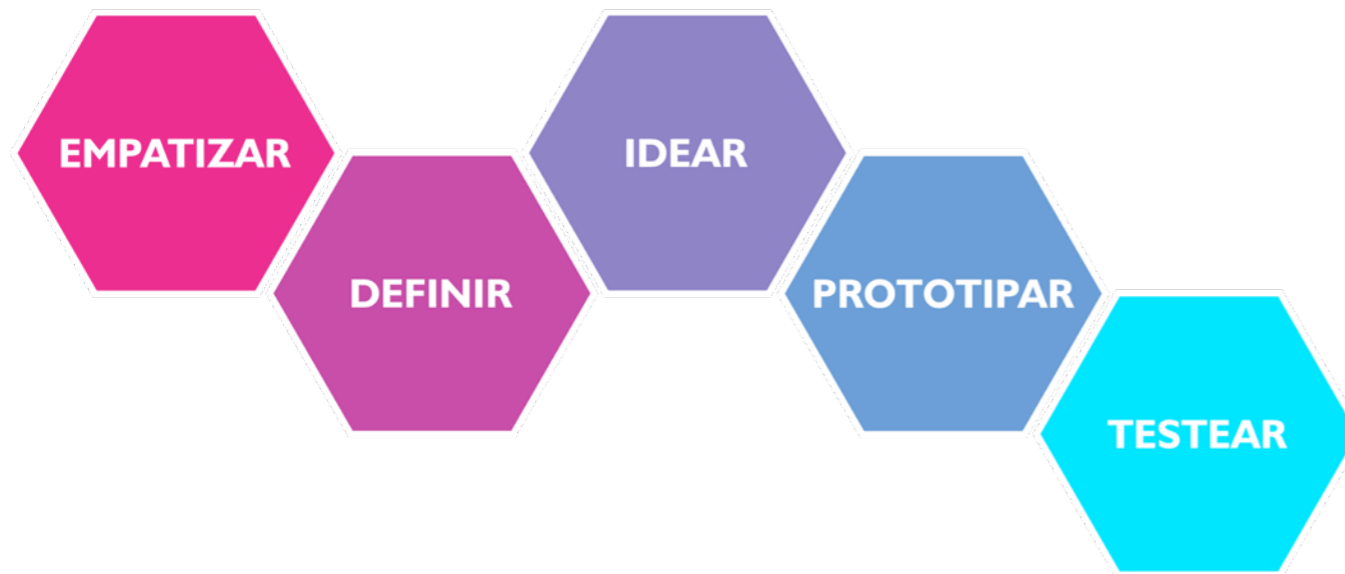
## Aprendizaxe por proxectos



O espazo maker e un espazo aprendizaxe que anima os rapaces e as rapazas a fedellar, xogar e realizar exploracións “open-enden” con ou sen tecnoloxía.

# ESPAZO MAKER

## Metodoloxía Design thinking

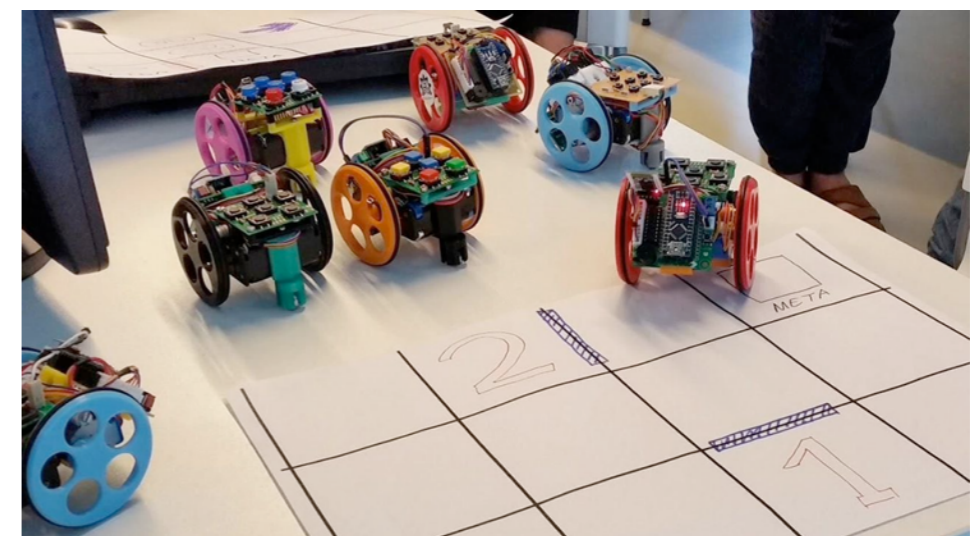
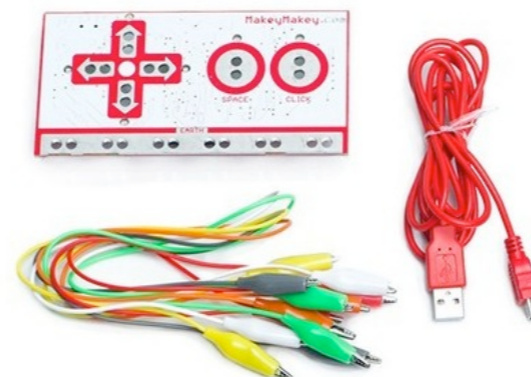
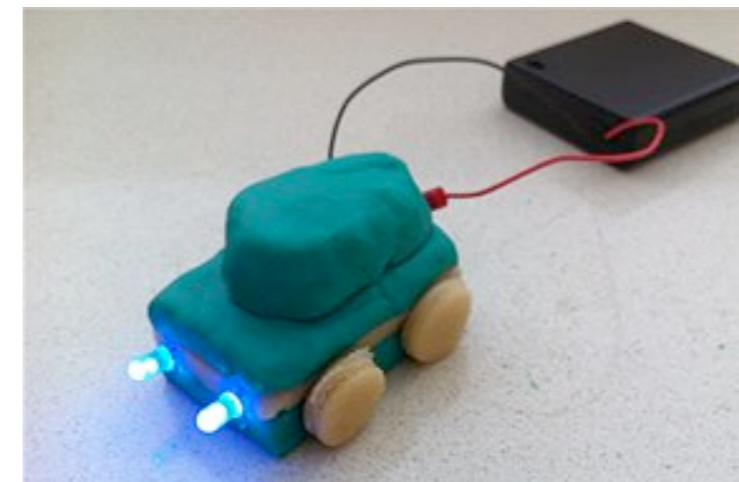


# ESPAZO MAKER

## STEM / STEAM

Temas relacionados coa programación e o fomento das STEM

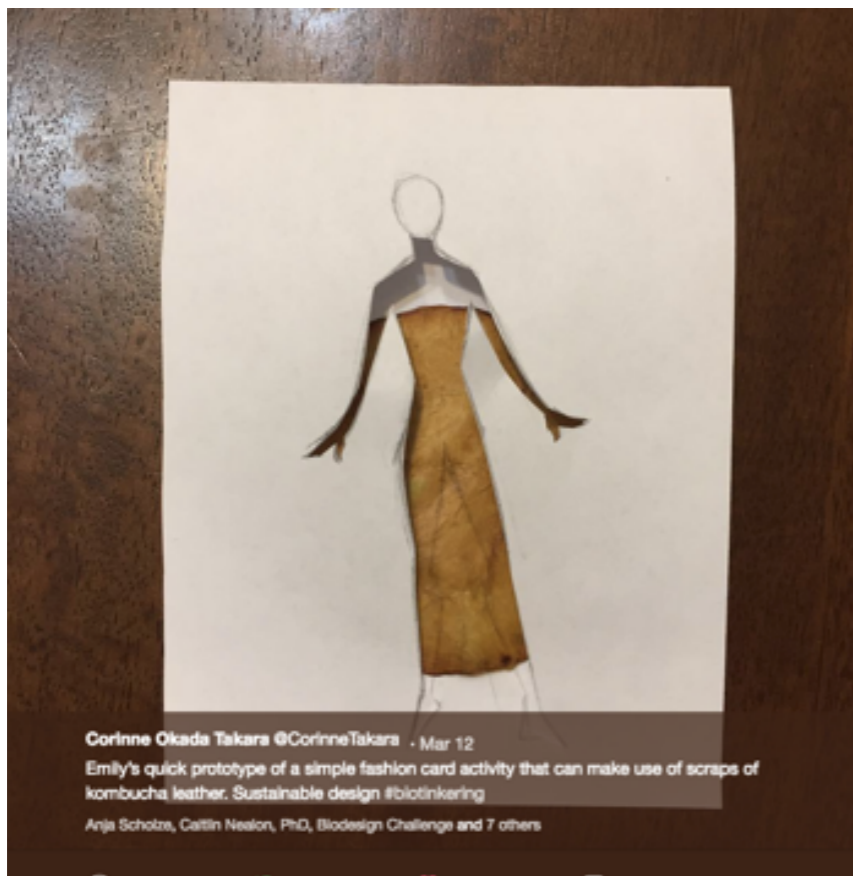
- Robótica
- Enxeñería
- Impresión 3D
- Gastronomía molecular
- Biomateriais
- Wearables
- Electricidade/ Electrónica
- Narrativas Dixitais
- etc



# ESPAZO MAKER

## STEM / STEAM

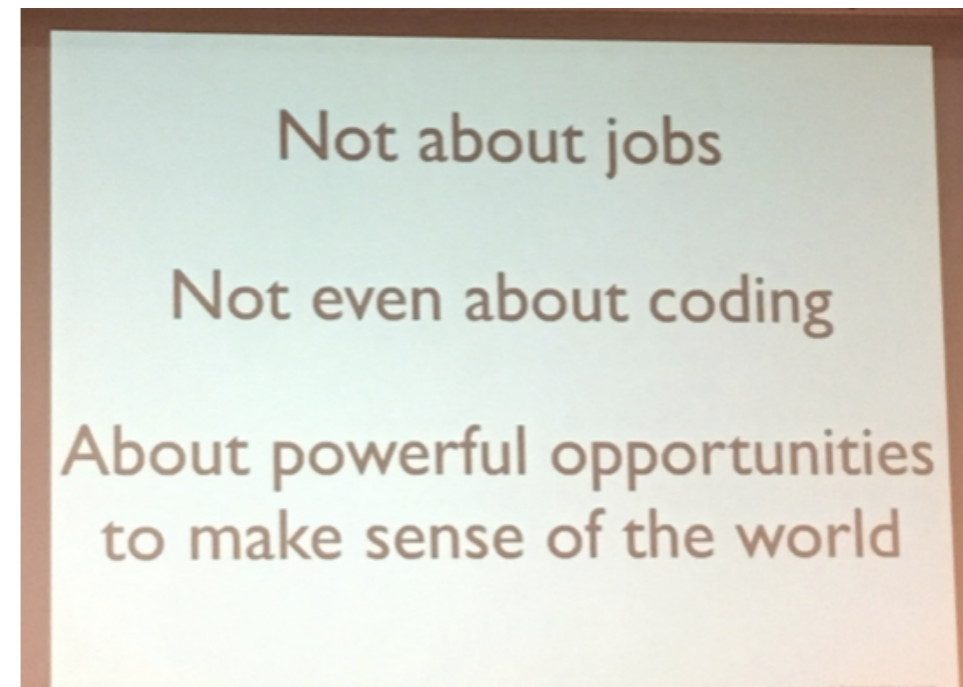
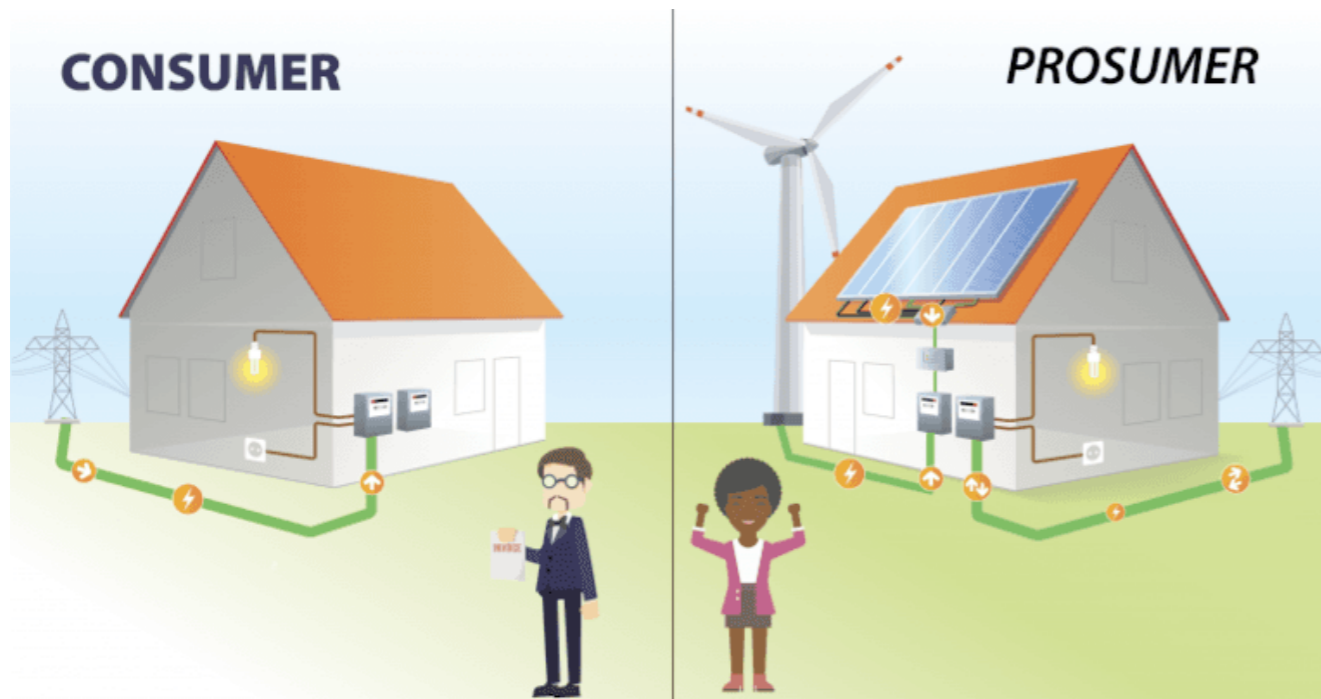
Biotinkering & Biotechnology



Xerar novos textiles a base de té verde, azúcar e kombucha (simbiosis de bacteria, levaduras e outros microorganismos)

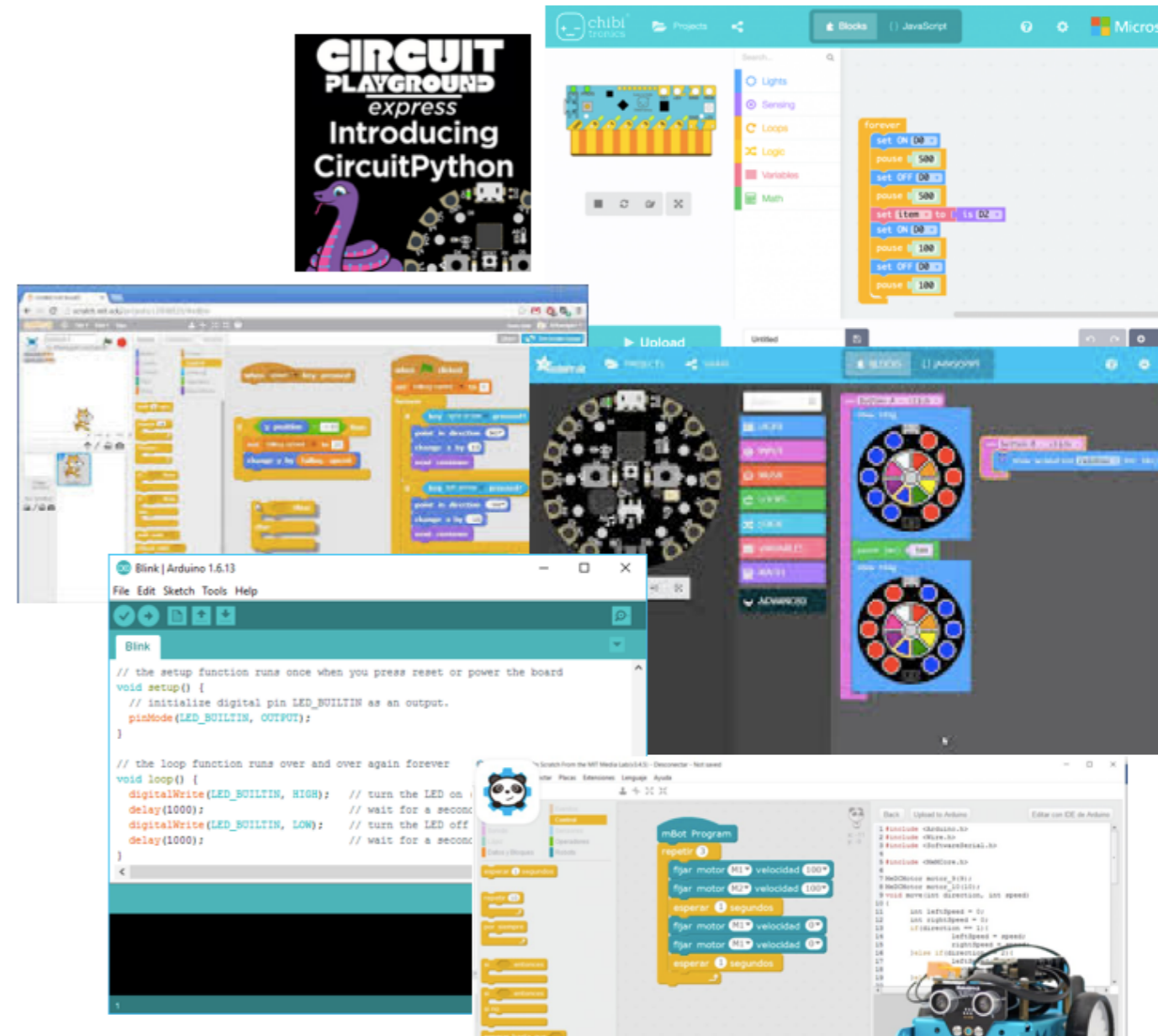
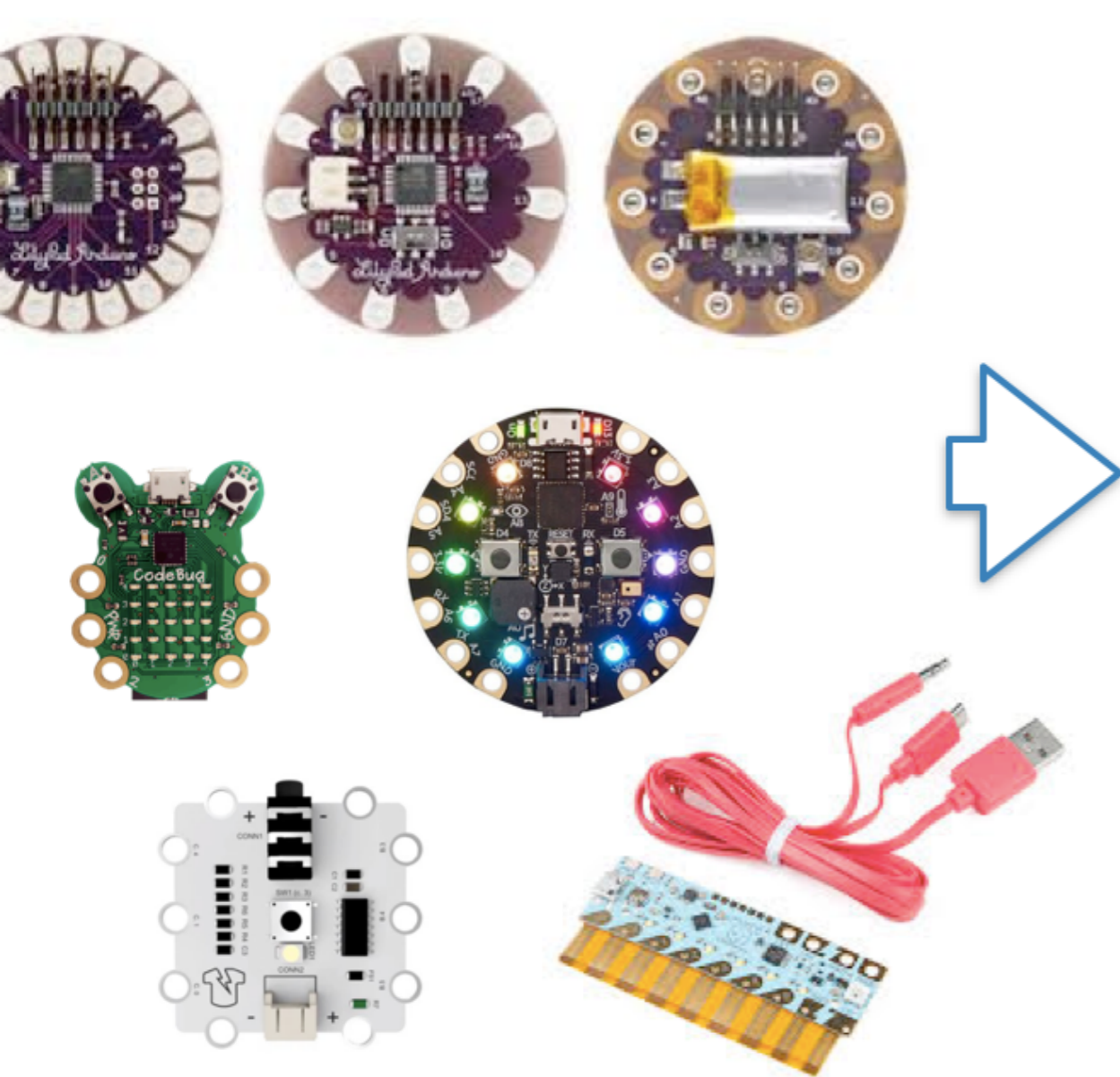


# ESPAZO MAKER




O desenvolvemento do pensamento computacional busca que as persoas sexamos capaces de facer fronte á complexidade dos problemas actuais en calquera campo de estudo, e non só os problemas relacionados co campo da computación.

# ESPAZO MAKER



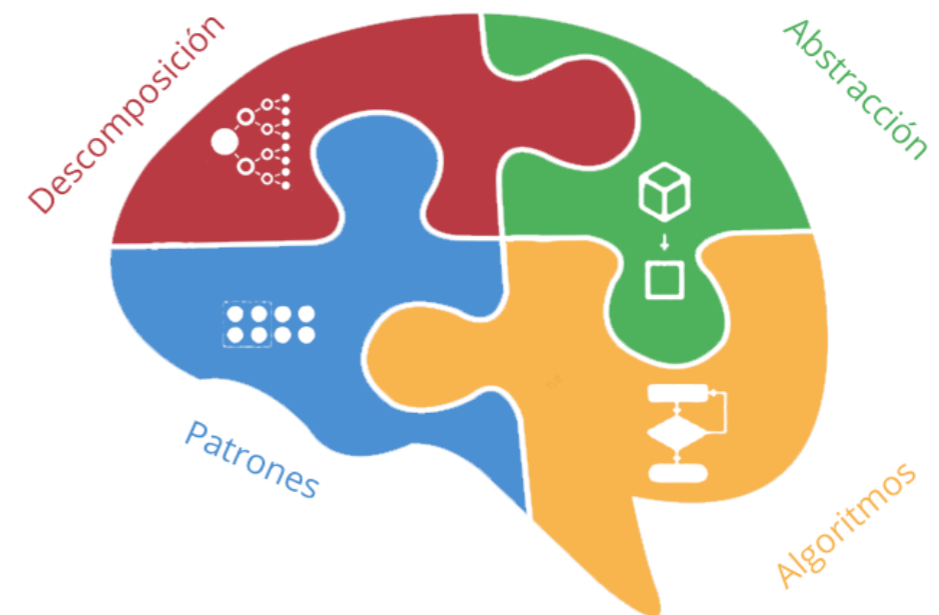

# PENSAMENTO COMPUTACIONAL



“Computer science is not computer programming. Thinking like a computer scientist means more than being able to program a computer. It requires thinking at multiple levels of abstraction.”

**Jeannette M. Wing**  
Corporate Vice President of Microsoft Research

Image Source: Microsoft.com



O pensamento computacional é o proceso de descompoñer un problema complexo en partes fáciles de entender

**PENSAMENTO COMPUTACIONAL  
/ ROBÓTICA EDUCATIVA**



**SEYMOUR PAPERT**

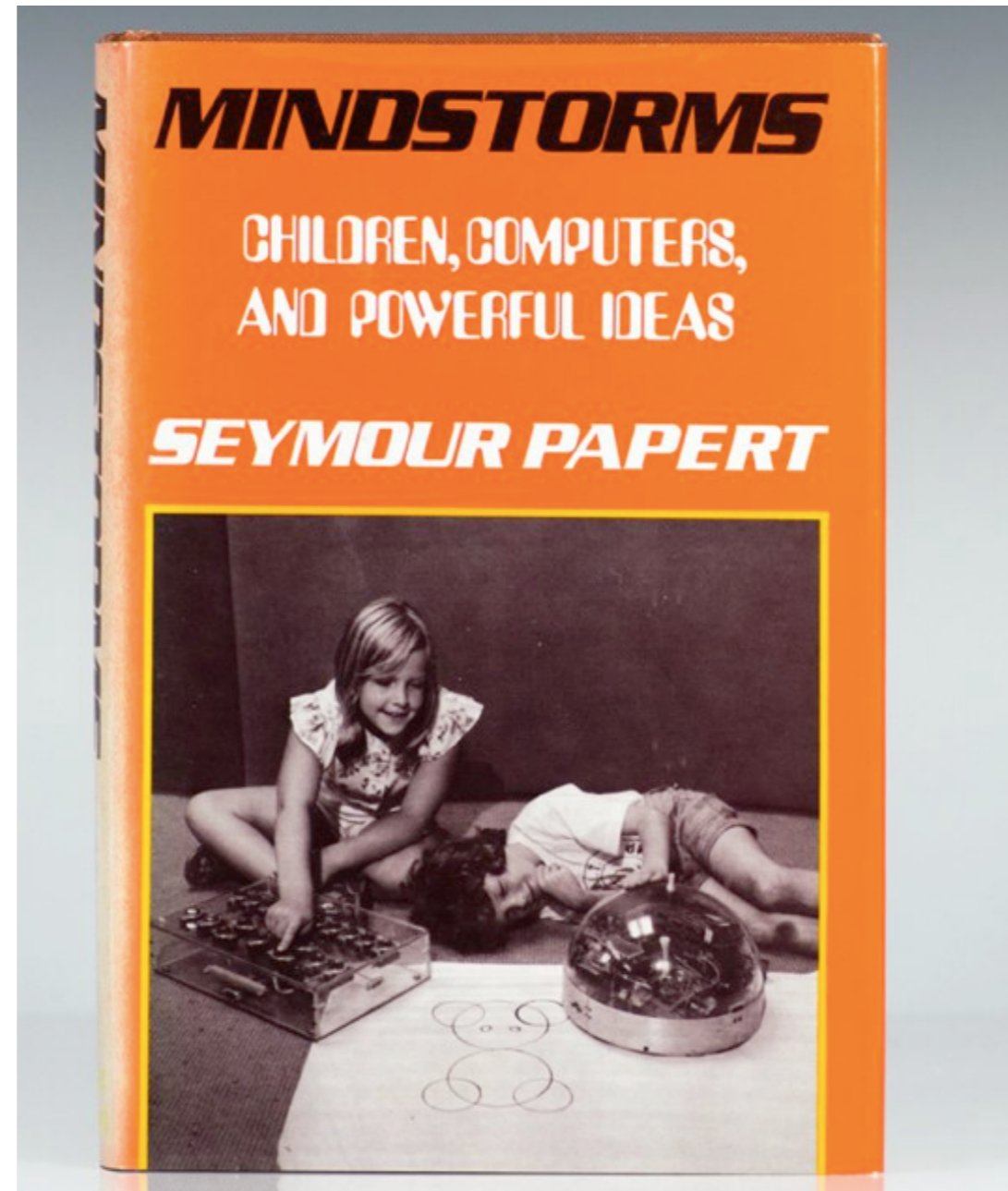
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*29 Febrero 1928 - 31 Julio 2016*

## TEÓRICO DEL APRENDIZAJE Y VISIONARIO DE LA EDUCACIÓN TECNOLÓGICA

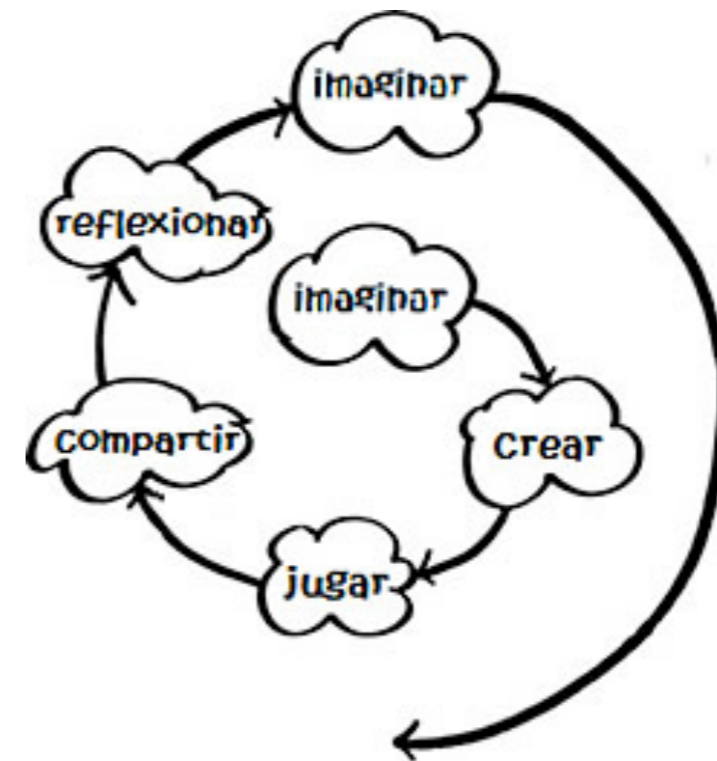
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Es considerado mundialmente como el pionero del pensamiento computacional, pues desde el desarrollo de sus estudios, reconoció el potencial revolucionario de los computadores en la educación.



Publicou no 1980 o libro “Desafío á Mente: Computadoras, Nenos e Ideas Poderosas” que revolucionou a concepción que se tiña sobre a relación que se establece entre as nenas e nenos coas computadoras.

## Mitchel Resnick



Na sociedade actual, as tecnoloxías dixitais son un símbolo de posibilidade e progreso. Cando os nenos aprenden a usar as tecnoloxías dixitais para expresarse e compartir as súas ideas programando, comezan a verse a si mesmos de novas maneiras. Comezan a ver a posibilidade de contribuír activamente á sociedade. Comezan a verse a si mesmos como parte do futuro.

*Lifelong Kindergarten, Mitchel Resnick*

## Jamin Kafai



E-téxtiles como alternativa para potenciar as competencias que se traballan coa programación e a robótica

Exploring Computer Science would like to introduce you to:

# STITCHING the Loop

An Electronic Textiles Unit in Exploring Computer Science

**Project 1: Paper Circuit**  
Single circuit project design: Create a simple paper circuit greeting card that includes one LED. Introduce the concept of aesthetic design and personalization.  
Key Concepts & Materials:  
• Simple circuit  
• Understanding polarity  
• Materials: LEDs, copper tape (with paper)  
(7-8 hours)

**Project 2: Wristband**  
Single wearable project: Create a wristband with three LEDs in parallel and a switch that turns on the project when the ends of the wristband are snapped together.  
Key Concepts & Materials:  
• Parallel circuit, switch  
• Designing and reading circuit diagrams  
• Three-dimensional project  
• Deconstruction  
• Materials: conductive thread, LEDs, battery and holder, fabric  
(3-4 hours)

**Project 3: Collaborative mural**  
Collaborative project: As a class create a mural with each panel made by two students. Each panel must have five independently programmable LEDs and two switches, allowing for four blinking light patterns.  
Key Concepts & Materials:  
• Programming for digital input: Sequences, conditionals, embedded conditionals or Boolean statements  
• Collaborative work & division of labor  
• Materials: Conductive thread, LEDs, fabric, microcontroller  
(10 hours)

**Project 4: Human Sensors**  
Custom project: Create a project with two aluminum foil patches that act as a sensor when both are touched by a person. Program four lighting patterns based on different sensor readings.  
Key Concepts & Materials:  
• Sensor design (two circuit boards)  
• Programming for analog input: operators, sensor range, Boolean statements  
• Materials: conductive aluminum foil, human body, LEDs, microcontroller, fabric  
(10-14 hours)



**Jamin Kafai**



**Deborah Fields**



**Colby Tofel-Grehl**



**Kylie Peppler**

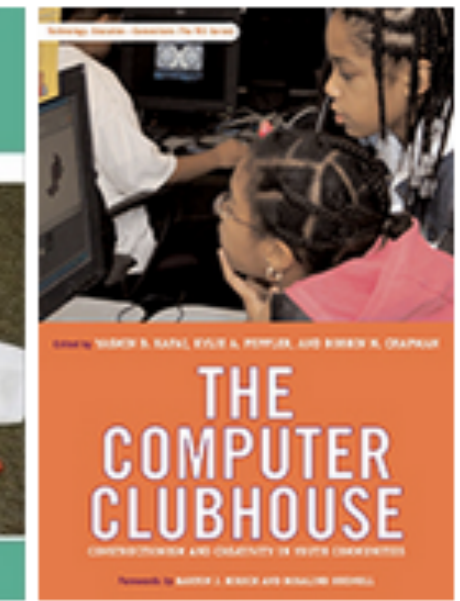


**Kristin Searle**





Como podemos axudar ás nenas e ás mulleres para comprender que os estereotipos baseados no xénero son conceptos artificiais e que as carreiras e os estudos vinculados ás STEM tamén están abertos para elas?

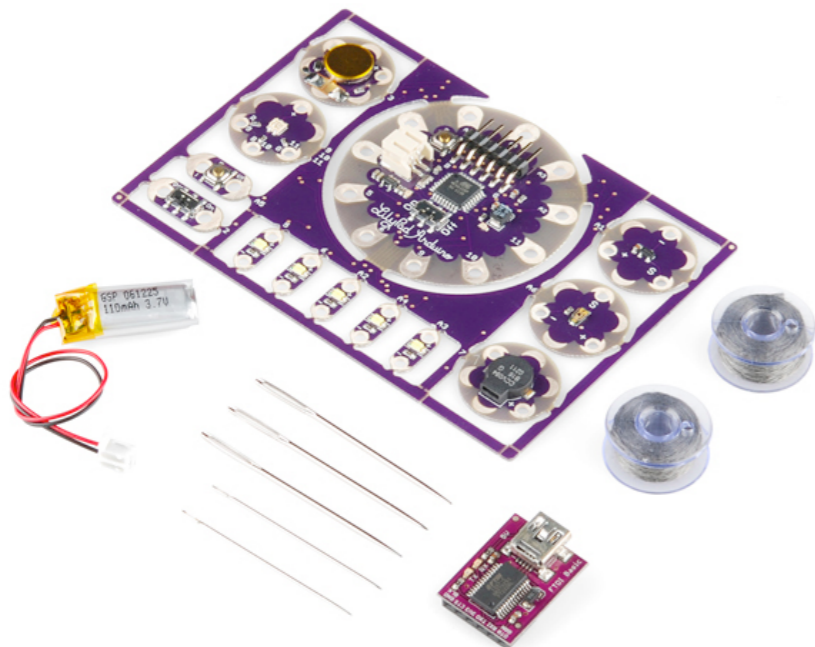
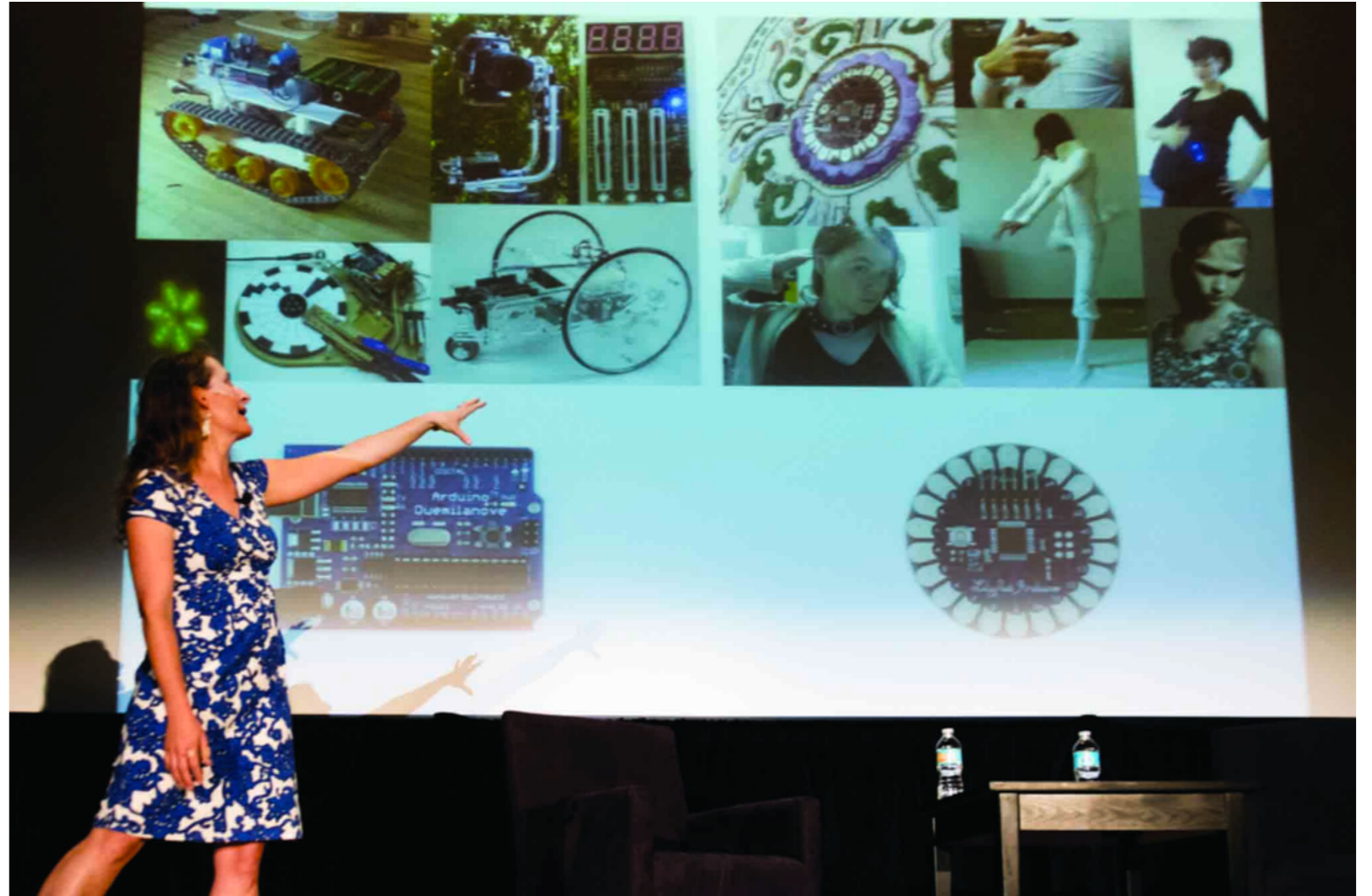


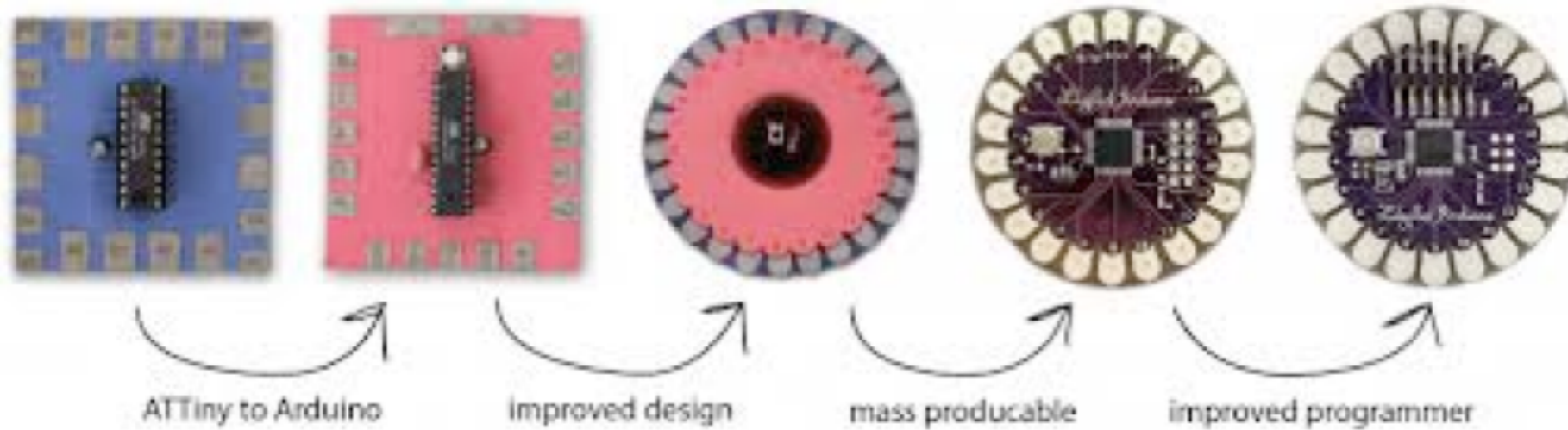
## As actividades vinculadas os e-téxtiles como una entrada alternativa as Ciencias da Computación

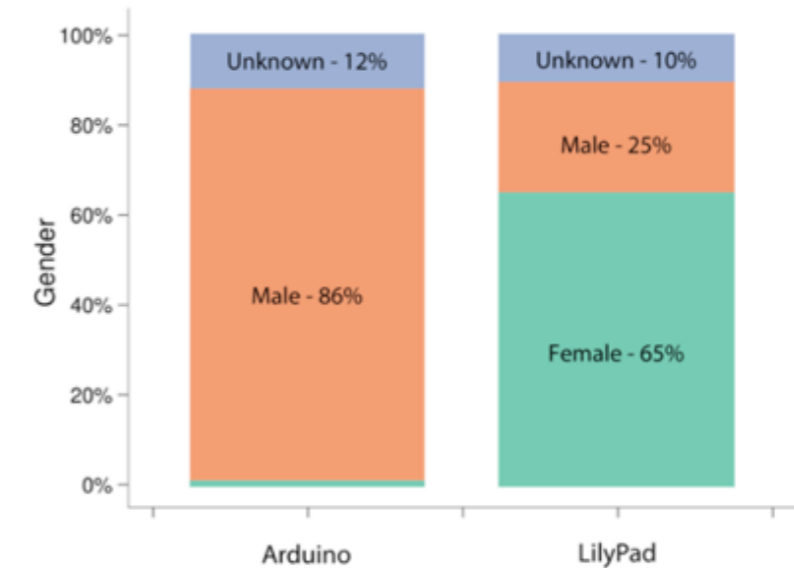


- Fai que a tecnoloxía oculta sexa visible e tanxible.
- Ensinar conceptos de electrónica a través do *craft*
- Amigable para principiantes, fácil de usar
- Inspira e compromete ás mozas en STEM
- Require menos equipo especializado que o soldar ou utilizar a placa de probas

## Leah Buechley





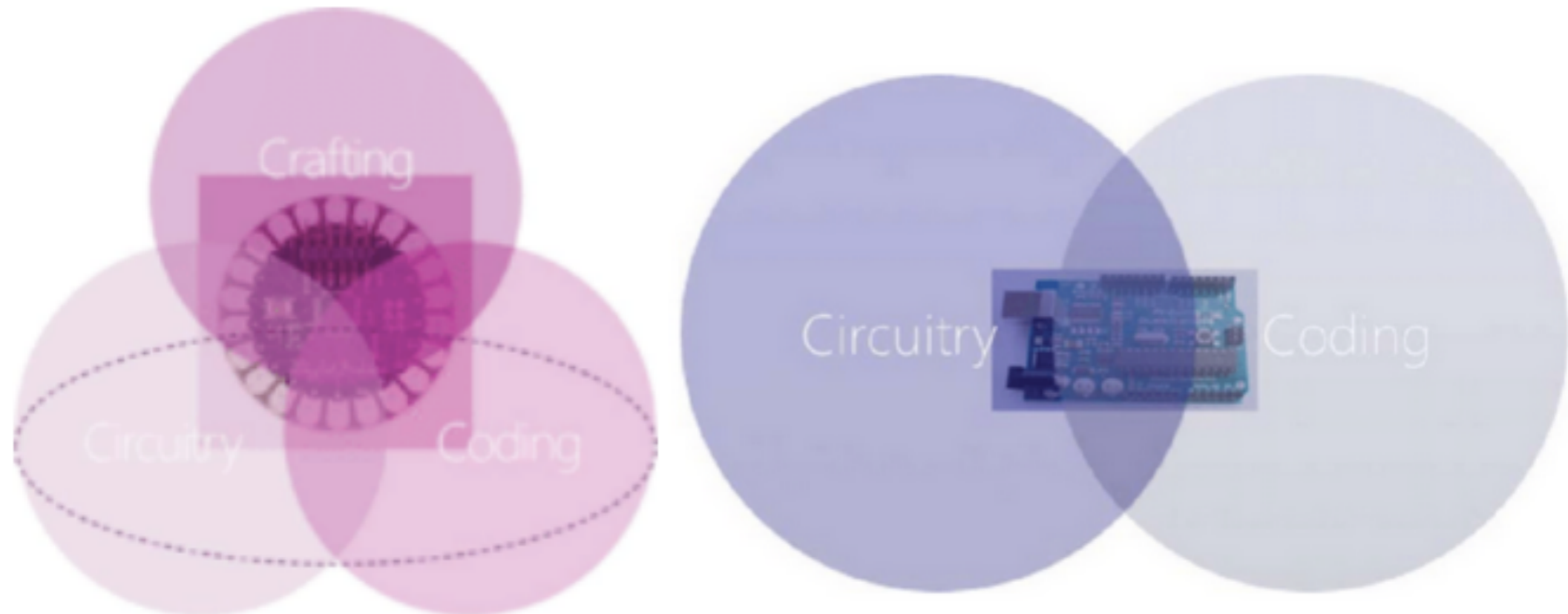


**Figure 4.** LilyPad/Arduino projects by gender.  
 (Arduino N=114, LilyPad N=57)

**Table 3.** LilyPad/Arduino builder contingency table.

	Arduino	LilyPad	
<b>Unknown</b>	14	6	12%
<b>Male</b>	98	14	65%
<b>Female</b>	2	37	23%

LilyPad in the wild: How hardware's long tail is supporting new engineering and design communities( L Buechley)



### STEAM vs STEM

Theorizing the nexus of STEAM practice por Kylie Peppler y Karen Wohlwend



## Limor Fried



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News, Resources, & More ...

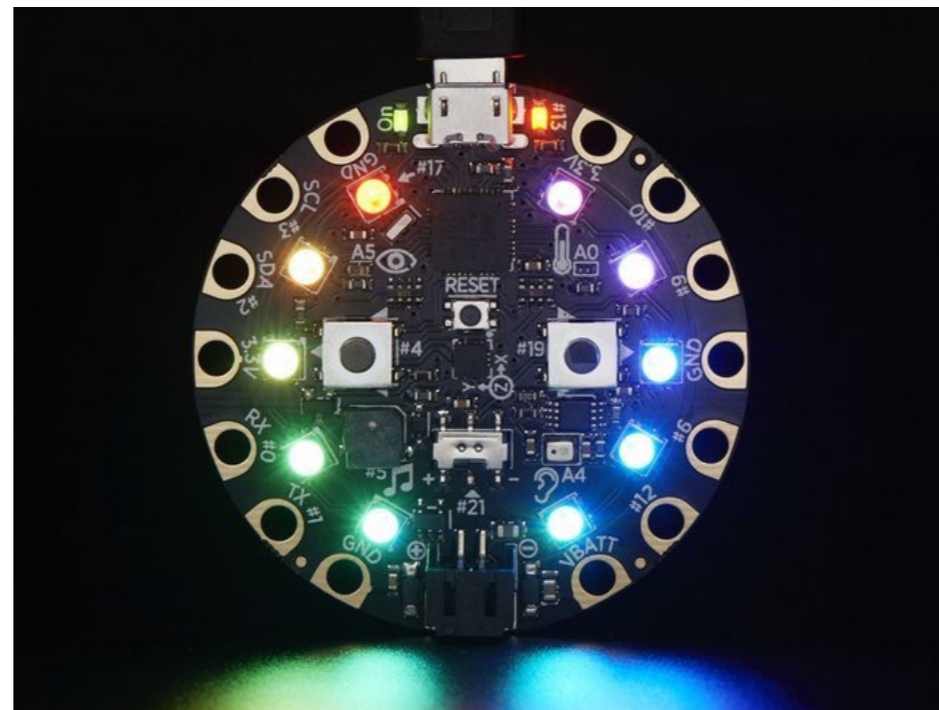
JANUARY 30, 2019 AT 11:00 AM

### Turn Your Zipper into a Switch! #WearableWednesday

Zipper Switch with Conductive Thread

**Becky Stern**  
Director of wearable electronics, Adafruit

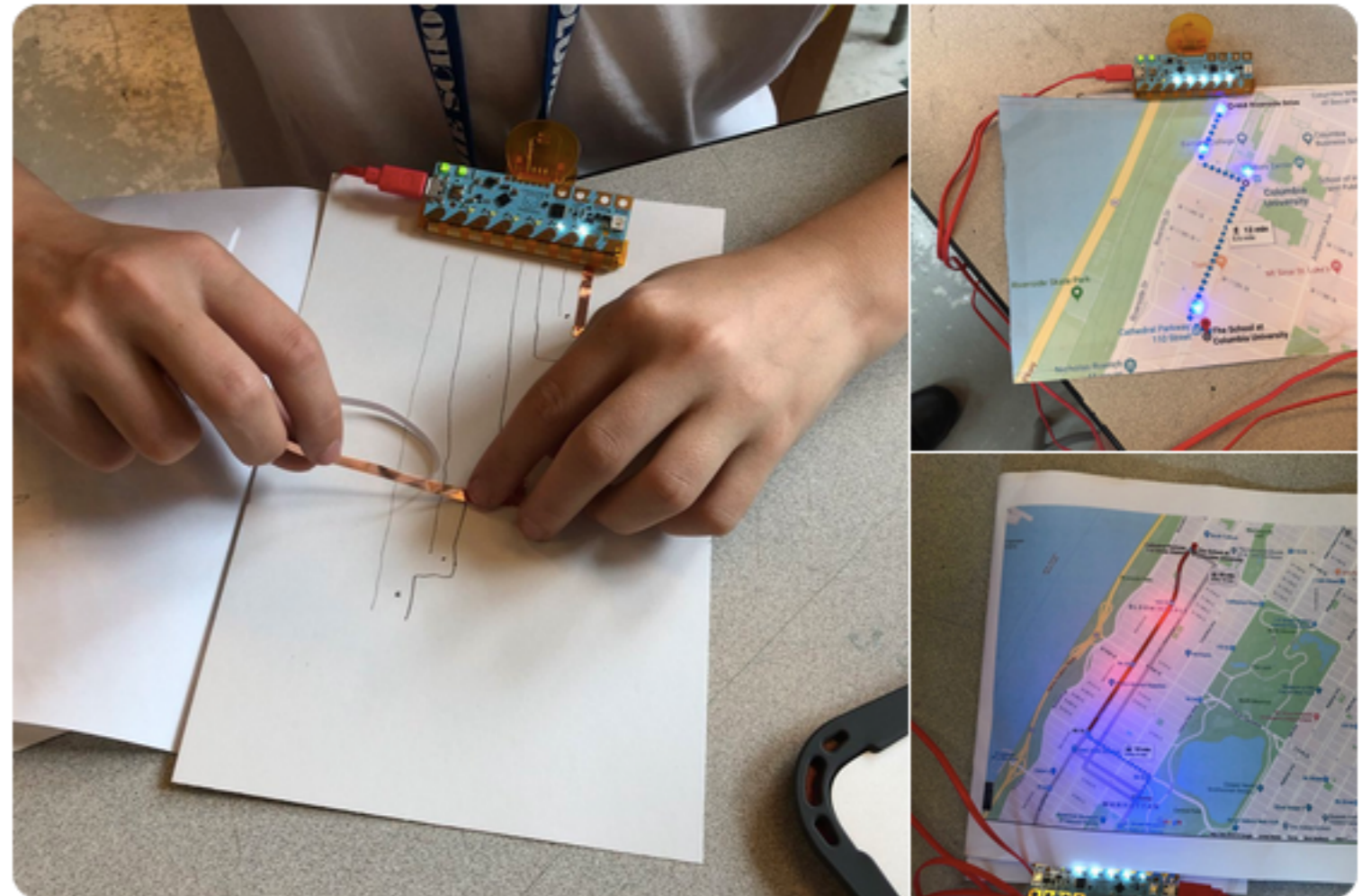
FILED UNDER: ADAFRUIT LEARNING SYSTEM, ADAFRUIT LEARNING TECHNOLOGIES, WEARABLES —  
TAGS: ADAFRUIT LEARNING SYSTEM, ADAFRUIT LEARNING TECHNOLOGIES, WEARABLE, WEARABLE WEDNESDAY — E STEPHANIE  
COMMENTS OFF



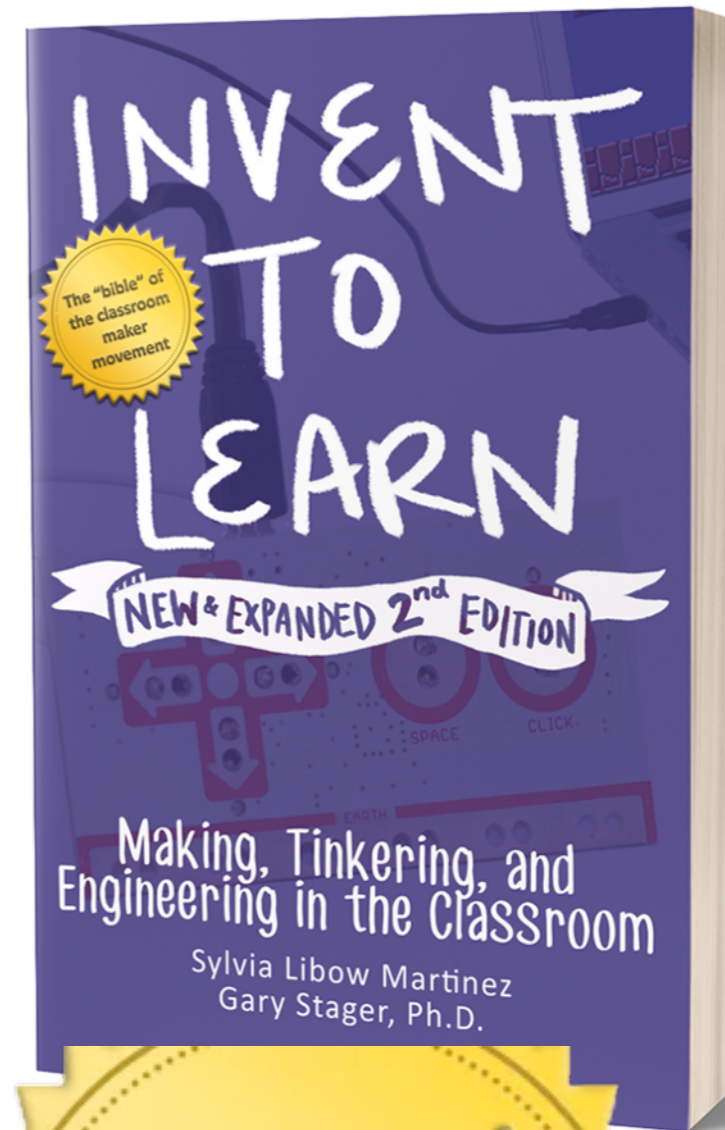
## Jie Qi



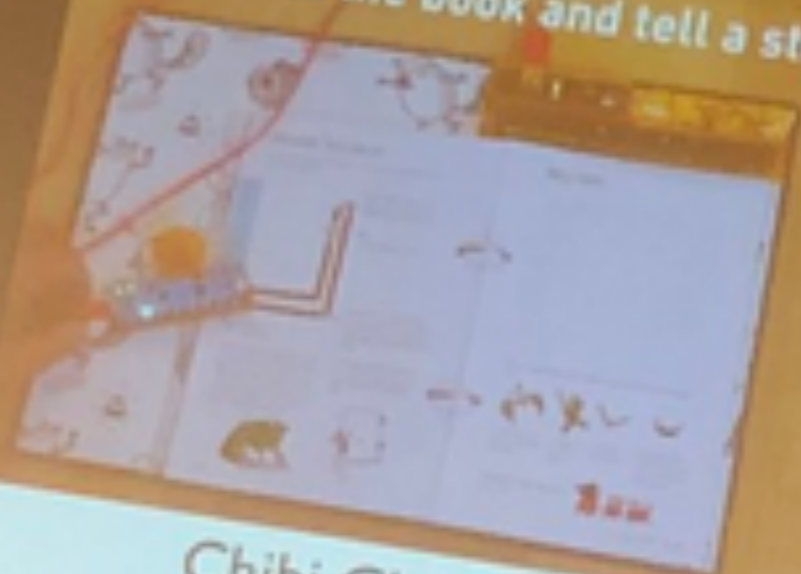
6th grade #art with @oharebros  
@The\_School building light up maps of their  
routes to school using @chibitronics Chibi  
Chips & LED stickers, conductive copper  
tape, maps. #makered #programming



## Sylvia Libow Martinez



clip it into the book and tell a story!



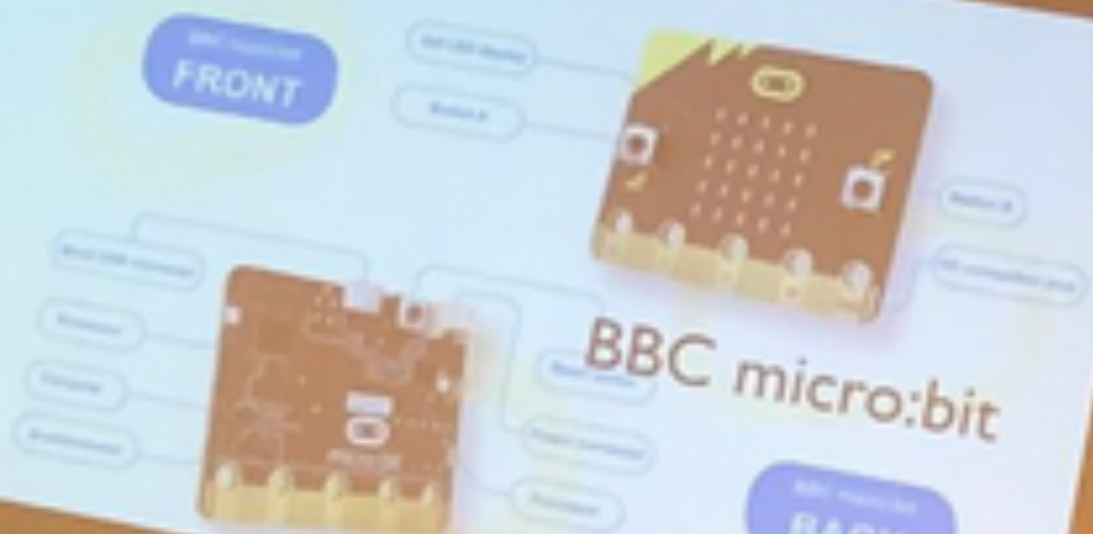
Circuit Playground Express

Chibi Chip

2019

© 2019 Sylvia Martinez

BBC micro:bit  
FRONT



BBC micro:bit

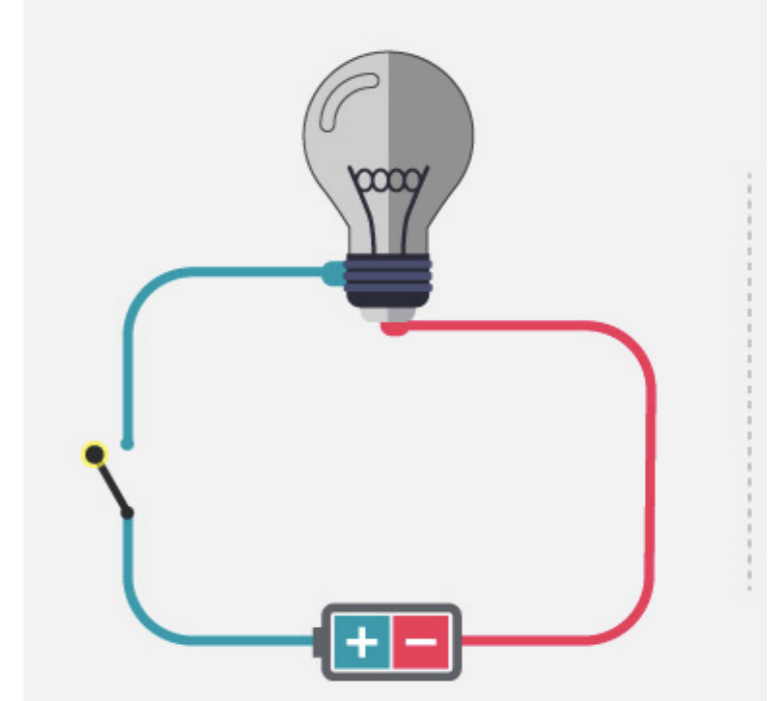
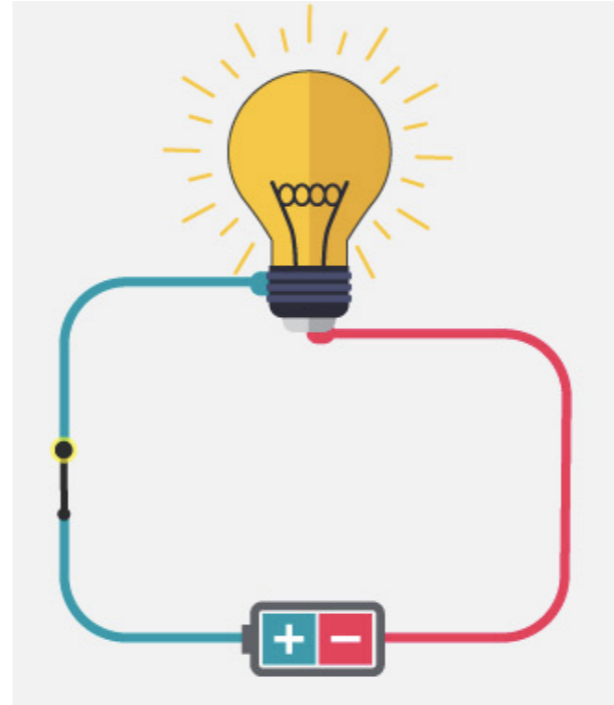
BBC micro:bit  
BACK



**Educación maker máis aló da robótica  
nas bibliotecas escolares de Galicia**



*Biblioteca PdB CEIP de Leirado*



**Para construír un circuío eléctrico necesitamos:**

**Batería** :É o elemento que nos proporciona a enerxía necesaria para que os electróns circulen.

**Fio**: É o medio polo que os electróns van circular. Está composto de cobre, que é un material condutor, e **LEDs** É os elementos receptores da electricidade. Recíbena para transformala en luz.

**Interruptor interruptor ou pulsador.** Son os elementos que me permiten manobrar sobre o circuío.



**BIBLIOTECA DE LEIRADO**  
CEIP DE LEIRADO (SALVATEIRA DE MIÑO)

"MIL COUSAS PODEN PASAR"

Inicio   Coñecer a Biblioteca   Aprender a aprender   Recursos na rede   Familias   Mestres/as   Boletíns e guías

20/2/19

### TECNOLOXÍA E ARTE, PARA PROFES

Tarde de formación con **Paola Guimerans**, aprendendo a facer as nosas creacións utilizando tecnoloxía, para poder transmitir e contaxiar ao noso alumnado.  
Fagámolo nós mesmos, e aprenderemos facendo, utilizando e compartindo.  
Esa é a idea.



LECTURA DIXITAL

**LECTURA DIXITAL**  
Bibliotecas escolares de Galicia  
bga  
**ELBE.2**  
MUSEO DE OROURO

REDE BE DE GALICIA

Bibliotecas escolares de Galicia  
bga

PROXECTO 18/19

**XOGAMOS?**

SOMOS...





Buscar neste sitio:  Buscar

C.E.I.P. Pedro Antonio Cerviño

Galería fotográfica Aula Virtual

Acceso rápido

inicio correo reloxo

Portada

- inicio
- aviso legal (1)
- inicio (1)
- zona interactiva (74)
- zona privada (114)
- Formación docente (101)

Educativo

- Proxecto Educativo e outros documentos (PXA, NOF, Proxectos, Plans)
- Programacións didácticas

O Centro

- Secretaría (9)
- Documentos (6)
- Lexislación (4)
- Matrícula
- Calendario escolar (11)
- Avisos (1)
- Libros de texto (1)
- Coñece o noso centro (8)
- Datos destacadas (0)
- Taboleiro de anuncios (148)
- Plans e proxectos (5)

alumnado mestres/as familias zona Abalar

O Cervo dixital  
XORNALISTAS EN ACCIÓN EN BUSCA DE INFORMACIÓN

Iniciar sesión: [Accede co teu contrasinal](#)

Inicio

### (2018-2019) Participamos nunha docencia-obradoiro sobre e-textiles

PFPP - Seminario: Robótica nas aulas

Dentro do seminairo sobre "Robótica educativa", o profesorado do centro participante no Plan de Formación Permanente do Profesorado do centro (PFPP), asistiu a unha docencia-obradoiro a cargo de Paola Guimeráns, na que exploraron o potencial educativo dos e-textiles.

Recanto de infantil

INFANTIL

O recanto de...

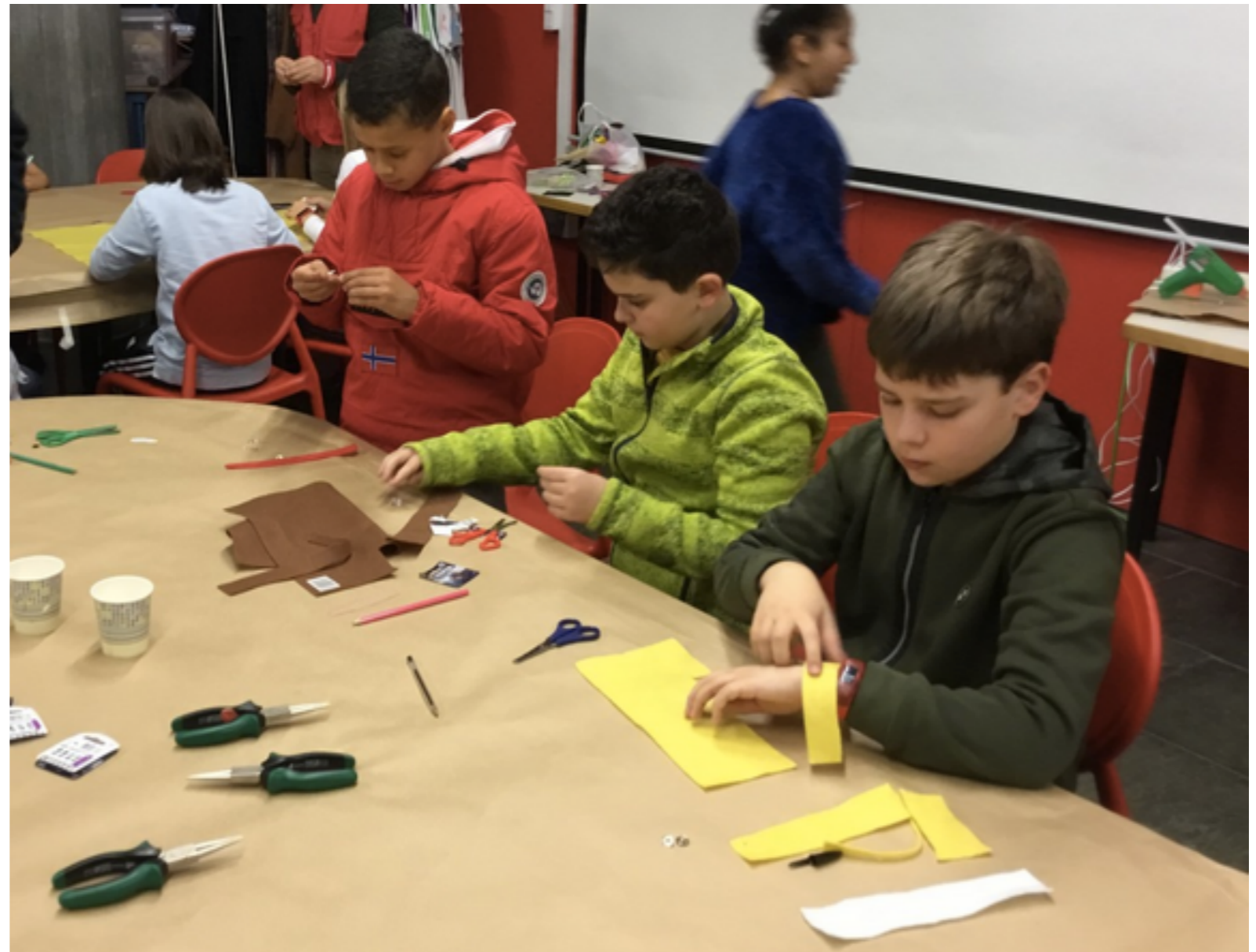
- infantil (1609)
- primeiro e segundo (115)
- terceiro e cuarto (0)

Servidor do centro

Servidor Abalar do centro

Taboleiro de anuncios

- Título: RESERVA DE PRAZA PARA O CURSO 2019-2020 (Do 1 ao 15 de febreiro)
- Título: ADMISIÓN DE ALUMNADO DE EDUCACIÓN INFANTIL E PRIMARIA. CURSO 2019-2020
- Título: Solicitudes de reserva de praza. Do 1 ao 15 de febreiro
- Título: FONDO SOLIDARIO DE LIBROS DE TEXTO E AXUDAS PARA A ADQUISICIÓN DE LIBROS E MATERIAL ESCOLAR 2017



*Pequen@s de 5º, Biblioteca PdB CEIP Ponte dos Brozos*



[Inicio](#) [Quen somos](#) [Onde estamos](#) [Canal Bibliobrozos](#) [Boletín de Novidades](#) [Proxecto escornabots](#) [Contactade connosco](#)

viernes, 15 de febrero de 2019

### Así cosían, así, así...

Fai dous meses Paola Guimeráns abriunos a porta dos e-textiles. Mostrounos como traballar a creatividade con circuitos cosibles. Tiñamos a porta aberta pero cruzala daba un pouco de medo. Temos descuberto que neste mundo dos makers na que a biblioteca anda a buscar un camiño, hai xente xenial, colaboradora, entusiasta e sempre disposta a axudar. E aí entran Manuel Miramonte e Pilar Lamas, Makers da Domus. Alá fomos a arrincar e-textiles con eles, porque xuntos todo parece máis fácil.

Deseñamos e fabricamos fundas de móbil, pequenos estoxos e pulseiras. Todos foron facendo e escollendo o grado de dificultade no que moverse. Aprendemos que o camiño é tan importante como o destino. As dificultades foron xurdindo e fomos buscando solucións reais a luces leds que non se acendían, a dar puntadas sen lear o fío, a enfiar agullas ou a poñer un interruptor. Aprendemos tamén a axudar aos compañeiros porque ninguén pode quedar atrás...

Houbo deseños minimalistas e houbo profusión de adornos. Houbo colorido, pompóns, estrelas, corazóns... Unha infinidade de posibilidades. Todo nun espazo que xa case recoñecemos como a nosa casa: a Domus e os seus makers.



[Slidely Gallery](#) Beautiful photo galleries

#### A nosa mascota Brocifios



#### Premio Espiral Edublogs



#### Makers PdB



#### BIBLIOTECA CREATIVA



#### Proxecto escornabots



**“Aprendimos que facer e que no facer ,e a cerrar as posibilidades do  
deseño”**

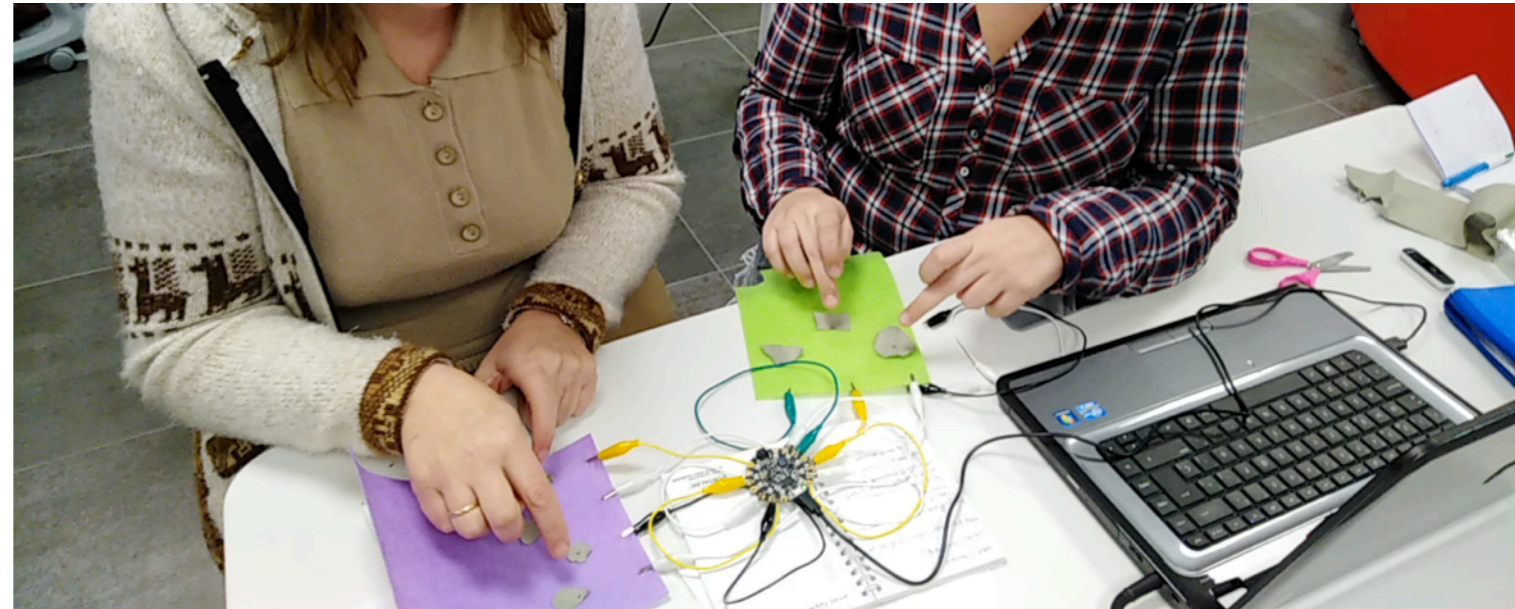
**“Para min o máis interesante era como ían funcionar dous pequenos con  
necesidades educativas”**

**“ Eu quería quedar cos seus deseños pero non houbo forma”**

**“Atallamos estereotipos do estilo "os nenos non cosen" (que houbo)”**

**MARIA CES COUTO**  
*Biblioteca PdB CEIP Ponte dos Brozos*





## Iniciación a proxectos STEM

Centro Autonómico de Formación e Innovación (CAFI)

# Graciñas

<http://paolaquimerans.com/tesisdoctoral/>

*paolaquimerans.com*

*aulasteam.com*

*prototipadolab.com*

*creativesoftcircuits.com*

