



XVI Congresso Latino-americano  
de Software Livre e Tecnologias Abertas

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Realização:



# Como o open hardware pode impactar na educação do nosso país

*Palestrante:*

**Fábio Souza**



AGENDA LATIN.SEC



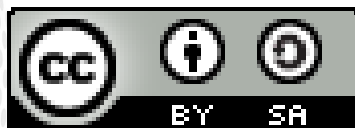
HACKATHON  
LATINOWARE 2019



Latinware EDU

# Como o open hardware pode impactar na educação do nosso país

**Por Fábio Souza**



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Repositório publico: <https://github.com/FBSeletronica/Palestra-Como-o-open-hardware-pode-impactar-na-educa-o-do-nosso-pais>

# Fábio Souza

Engenheiro  
Professor  
Maker  
Embarcados  
Franziniinho



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CONTEÚDO SOBRE SISTEMAS  
ELETRÔNICOS EMBARCADOS PARA TODOS.  
**JUNTOS POR UM BRASIL MAIS TECNOLÓGICO.**

[www.embarcados.com.br](http://www.embarcados.com.br)

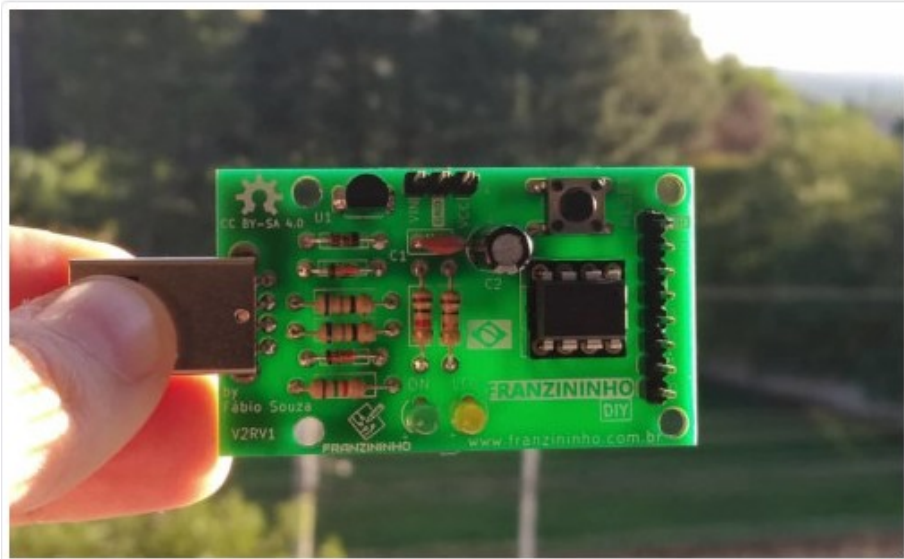


# Franzininho

O projeto Franzininho tem o objetivo de incentivar as pessoas na tecnologia através da cultura maker e do faça você mesmo.

Aliando a tecnologia com a pedagogia, construímos kits e atividades que estimulam o pensamento computacional e a vontade de fazer.

Temos atividades mão na massa para todas as idades e acreditamos que o mundo será um lugar melhor através do compartilhamento e da colaboração.



# Movimento Maker

Movimento ou cultura maker

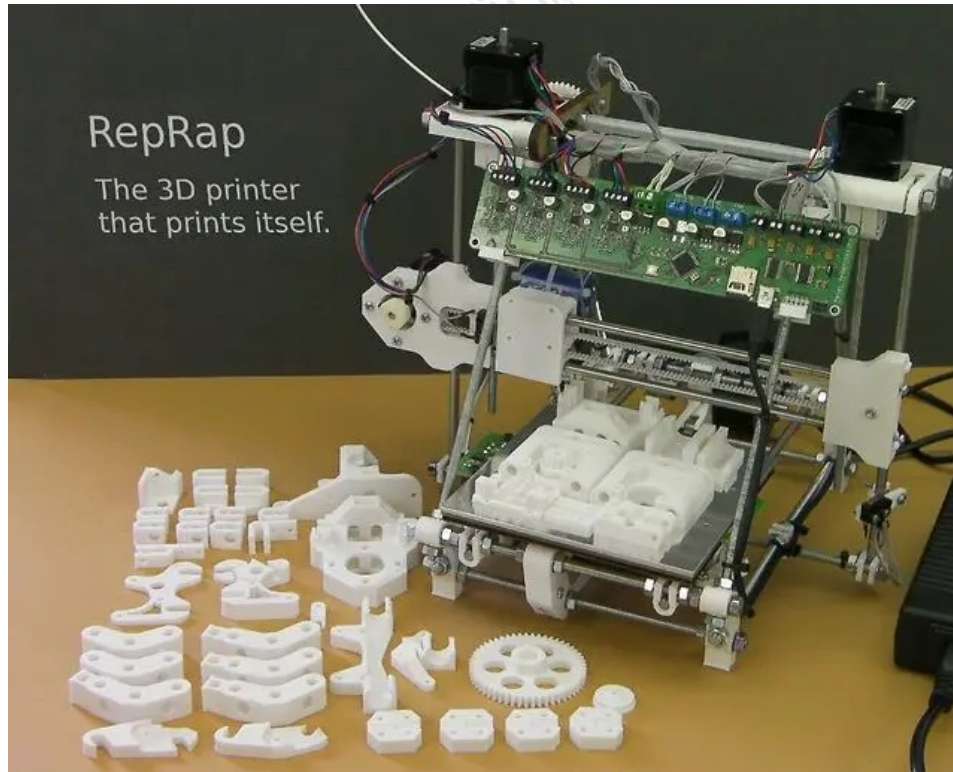
DIY – Faça você mesmo

Criação

Compartilhamento na internet

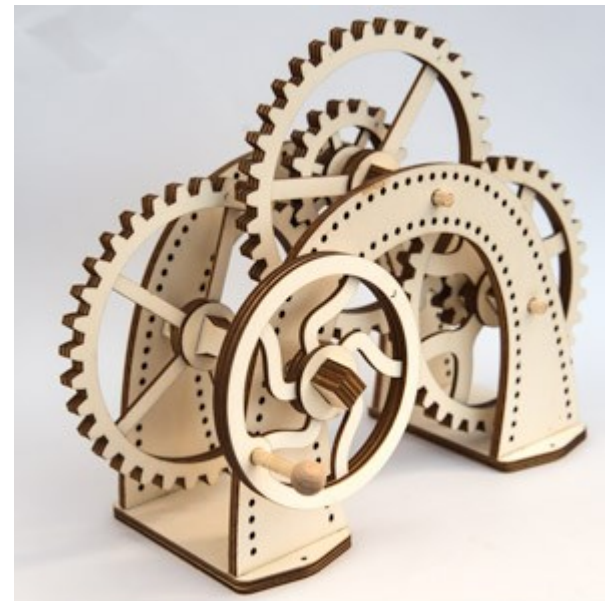
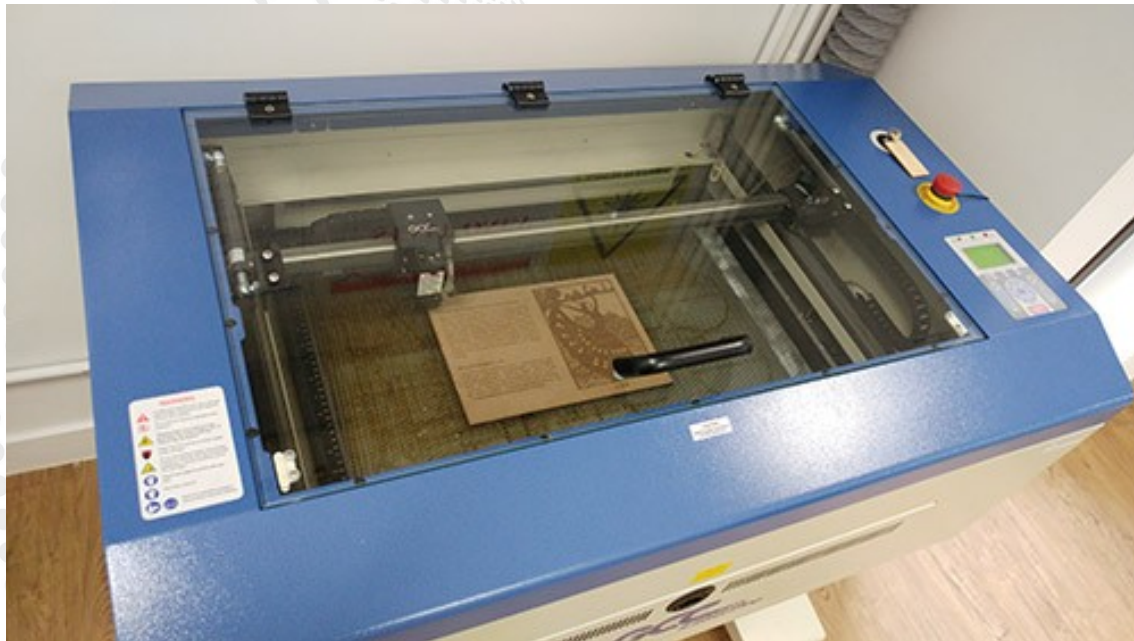


# Impressão 3D





# Corte a Laser

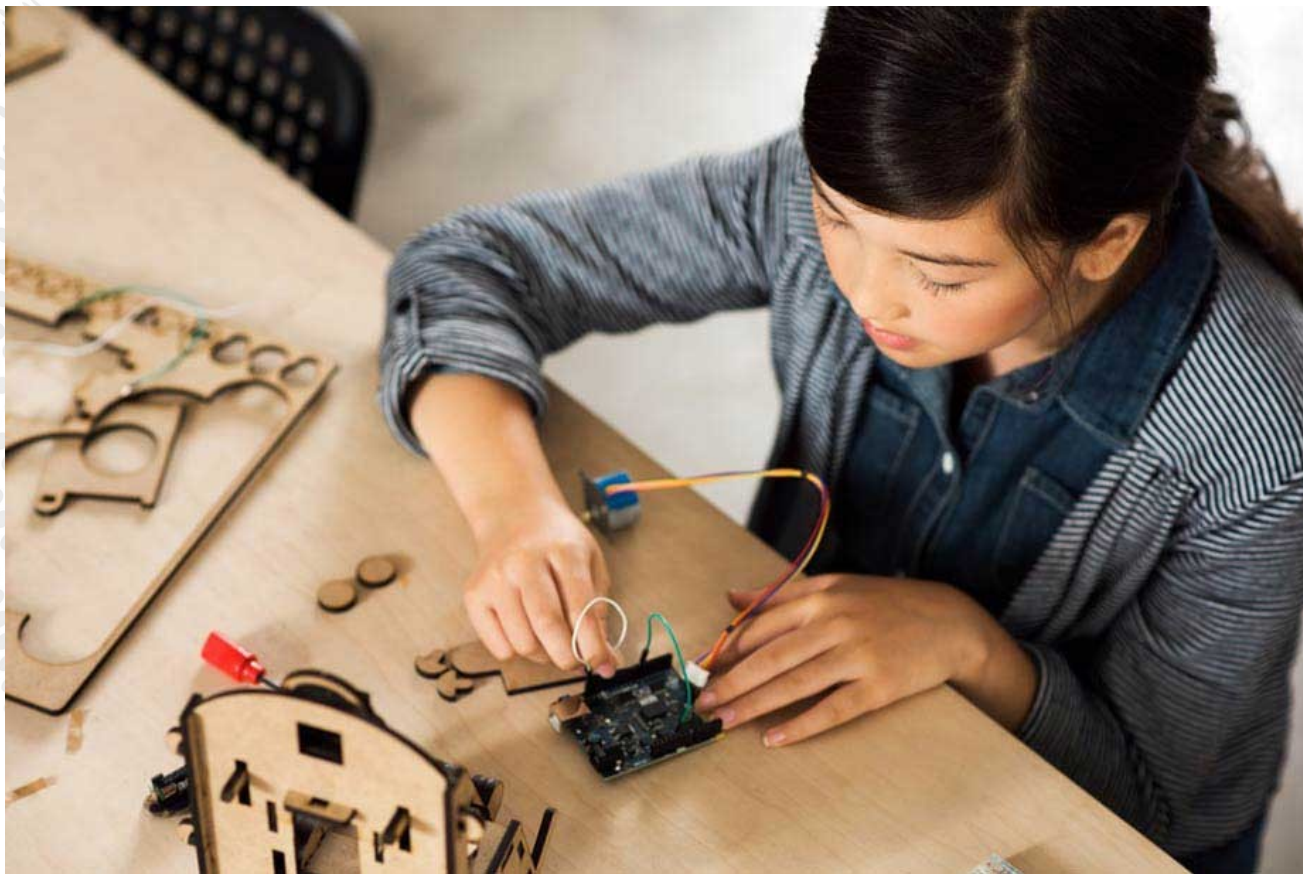




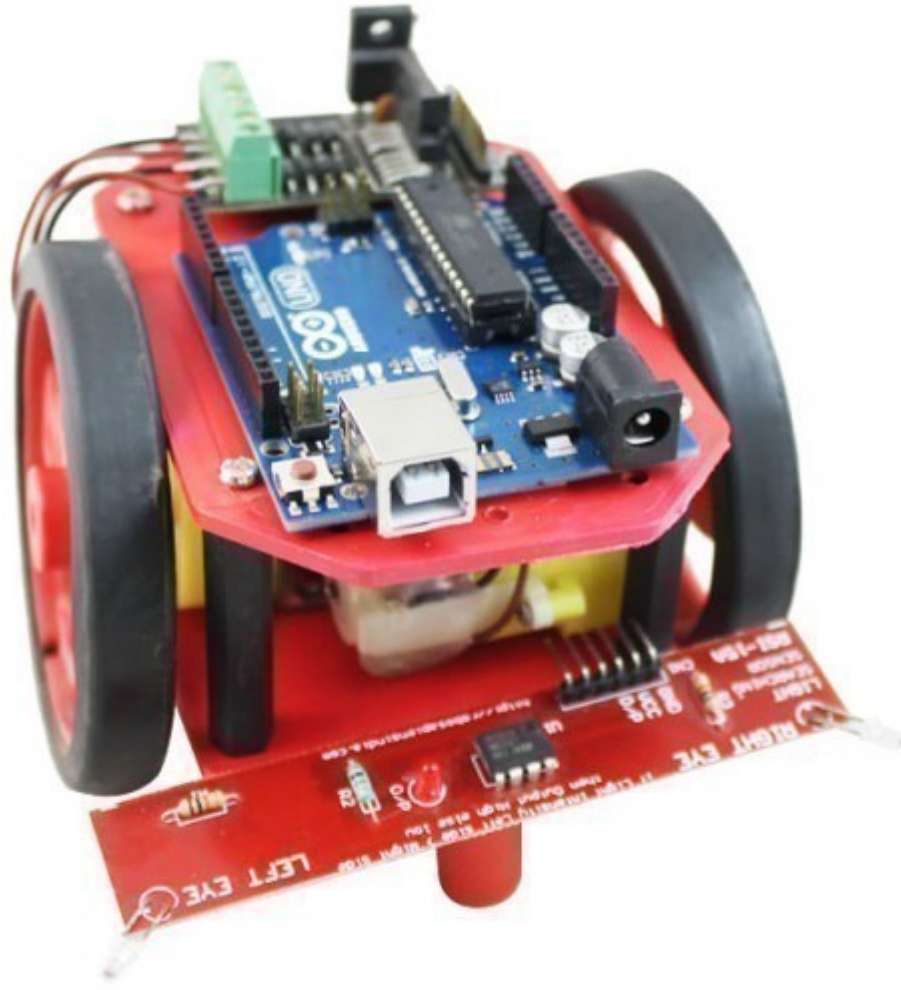
# Marcenaria



# Eletrônica



# Robótica





# Internet Das coisas



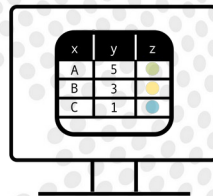


# Fabricação digital

## Digital Fabrication Process

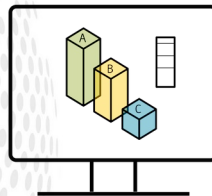
### Input

Spreadsheet



**Bits**

Computer Aided Design



**Bits**

Use CAD software to create 3D models of data objects and other components required for the installation

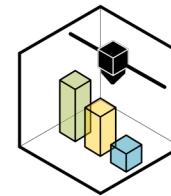
G-Code Generation



**Bits**

Convert CAD outputs into appropriate machine-readable formats

Production

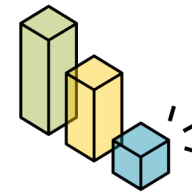


**Atoms**

Craft the physical objects, using additive or subtractive techniques

### Output

Physical Object



**Atoms**

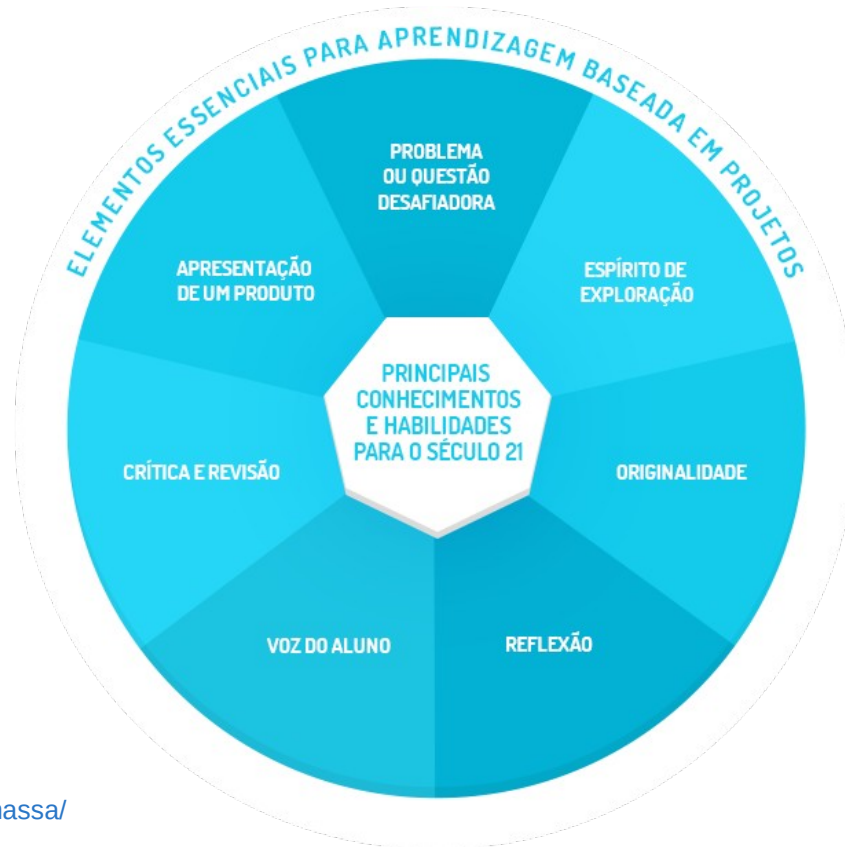
# Fablabs e Makerspaces





# O Movimento Maker na Educação

- Trabalho colaborativo
- Tentativa e erro
- Autonomia
- Saber Errar
- Atividades Lúdicas
- Experimentação
- Estimular Criatividade
- Empatia
- Questionamentos



<https://porvir.org/especiais/maonamassa/>

# Pensamento computacional

## The Computational Thinkers

### concepts



#### Logic

Predicting & analysing



#### Evaluation

Making judgements



#### Algorithms

Making steps & rules



#### Patterns

Spotting & using similarities



#### Decomposition

Breaking down into parts



#### Abstraction

Removing unnecessary detail



### approaches



#### Tinkering

Changing things to see what happens



#### Creating

Designing & making



#### Debugging

Finding & fixing errors



#### Persevering

Keeping going



#### Collaborating

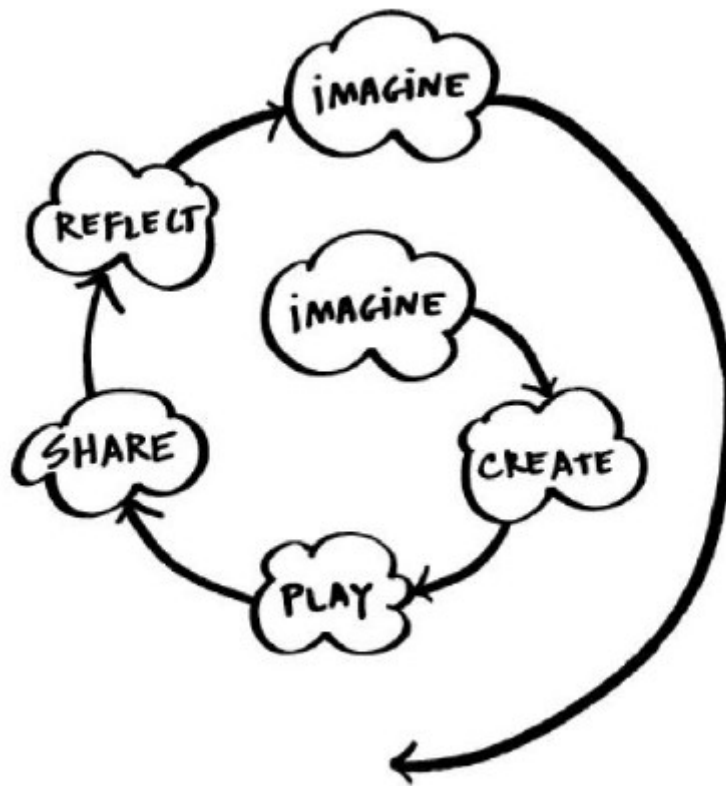
Working together

<https://callysto.ca/computational-thinking-101/>



# Aprendizagem Criativa

Proposta por:  
Seymour Papert e Mitchel  
Resnick no MIT no  
Lifelong Kindergarten



<https://novaescola.org.br/conteudo/17761/como-a-aprendizagem-criativa-pode-alavancar-o-processo-de-ensino-e-aprendizagem>

<https://descola.org/drops/espiral-aprendizagem-criativa/>

# E como o open hardware pode ajudar?

- Projetos compartilhados entre escolas e comunidade
- Projetos feitos de forma colaborativa
- Colaboração entre alunos e professores
- Engajamento da comunidade junto a escola
- Redução do custo dos materiais
- Não ficar preso a soluções impostas por empresas

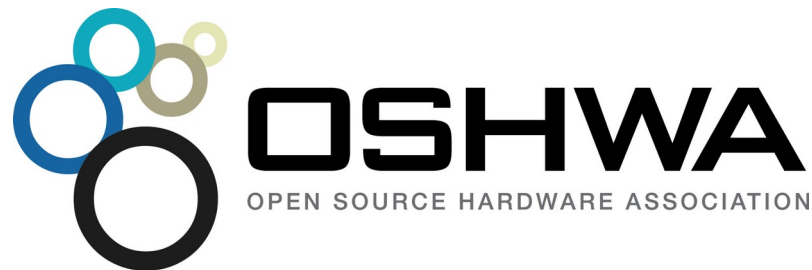


**open source  
hardware**

# O que é Open Hardware?

- Projeto disponibilizado ao público de modo que qualquer um possa:
  - Estudar;
  - Modificar;
  - Construir;
  - Distribuir;
  - Vender

Esteja emocionalmente preparado para ver o seu projeto sendo copiado e vendido



# Licença

Apenas tornar os arquivos públicos não é suficiente para torná-los abertos.





# O que licenciar?

- Hardware
- Software
- Documentação
- Marca

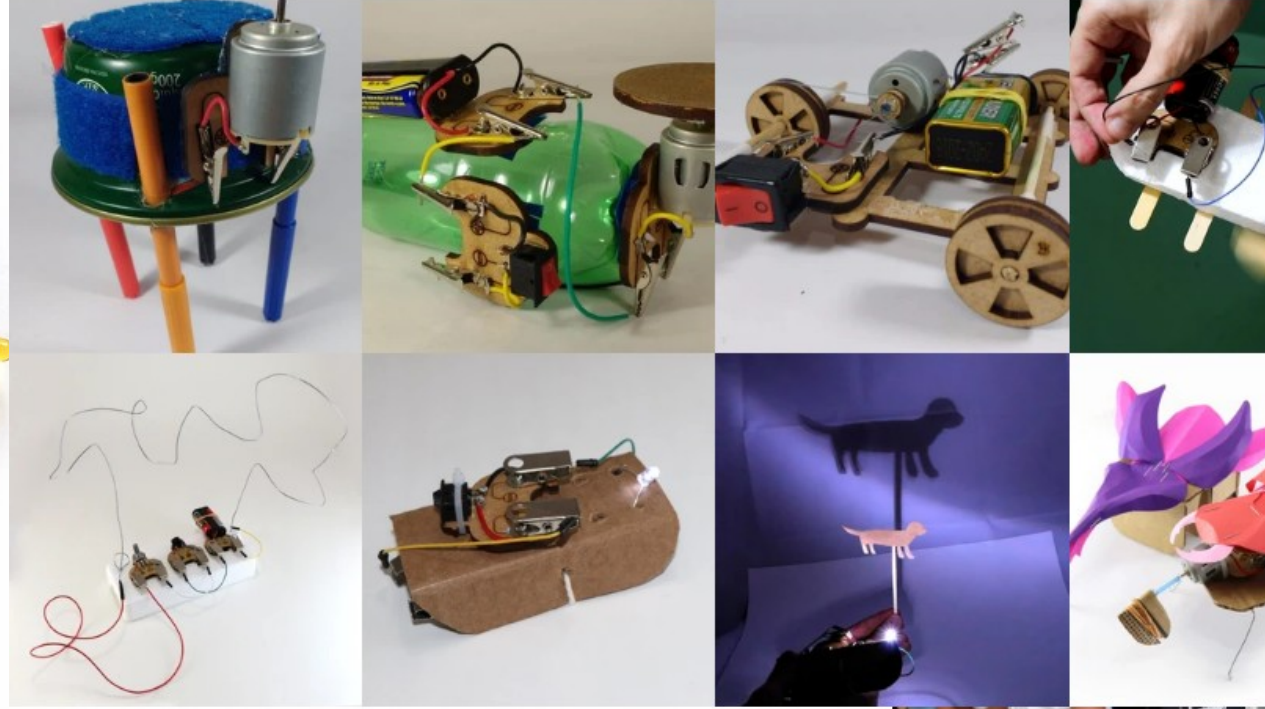


# Rute



<http://rute.io/>

# Scopabits

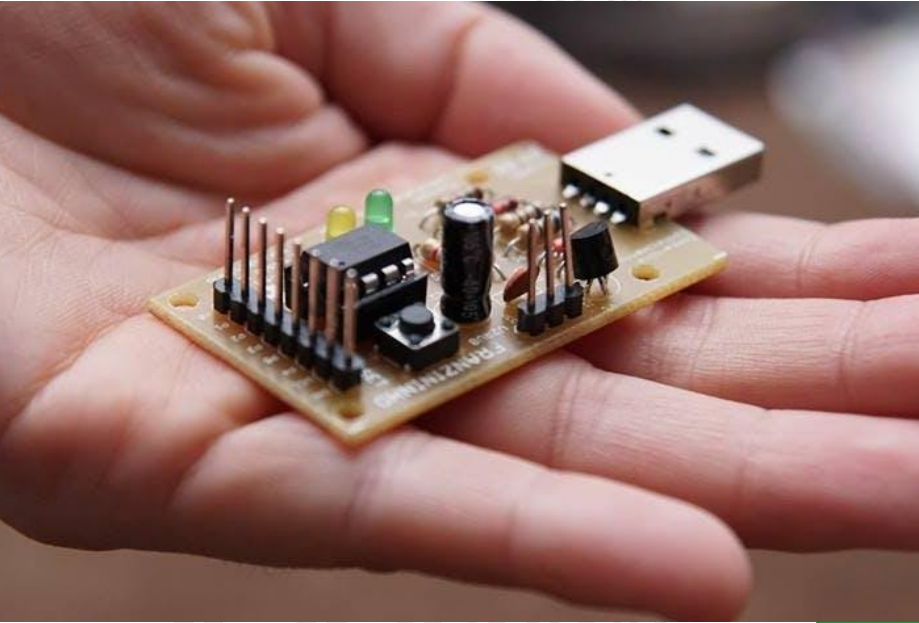


<http://scopabits.mystrikingly.com/>

# Mauablocks



# Franzininho DIY



<https://franzininho.com.br/>

# Como então aproveitar tudo isso na educação?



# Materiais abertos para todos

The screenshot shows the Instructables Teachers website. At the top, there is a navigation bar with links for Circuits, Workshop, Craft, Cooking, Living, Outside, and Teachers. On the right, it says 'Following' next to a user profile picture. Below the navigation bar, the 'instructables teachers' logo is on the left, followed by 'Projects' and 'Community' buttons. On the right, there are links for 'CONTESTS', 'CLASSES', and 'PUBLISH', along with a 'Let's Make...' button featuring a magnifying glass icon. The main banner features a large image of two children wearing safety goggles and conducting an experiment. Overlaid on the left side of the banner is the text 'A PROJECT FOR EVERY LESSON' in large white letters, followed by a paragraph: 'Instructables is committed to helping teachers inspire, engage, and prepare students through hands-on projects to make in the classroom. Always free, and always fun, come explore projects for your next classroom lesson!'. Below the banner, there are five colored buttons for grade levels: 'GRADES K-2' (purple), 'GRADES 3-5' (teal), 'GRADES 6-8' (red), 'GRADES 9-12' (yellow), and 'UNIVERSITY+' (green). At the bottom, there is a row of seven dark grey buttons for subject areas: 'ELA', 'MATH', 'SCIENCE', 'SOCIAL STUDIES', 'ENGINEERING', 'CODING', and 'ELECTRONICS'. A right arrow icon is visible on the far right of this row.

Circuits Workshop Craft Cooking Living Outside Teachers

Following

instructables teachers Projects Community

CONTESTS CLASSES PUBLISH Let's Make...

## A PROJECT FOR EVERY LESSON

Instructables is committed to helping teachers inspire, engage, and prepare students through hands-on projects to make in the classroom. Always free, and always fun, come explore projects for your next classroom lesson!

GRADES K-2 GRADES 3-5 GRADES 6-8 GRADES 9-12 UNIVERSITY+

ELA MATH SCIENCE SOCIAL STUDIES ENGINEERING CODING ELECTRONICS

Education Partners

# Dúvidas?

*Contato:*

**[about.me/fabio.souza](https://about.me/fabio.souza)**

LATIN**WARE** 2019

