



XVI Congresso Latino-americano  
de Software Livre e Tecnologias Abertas

27 a 29 de novembro de 2019  
FOZ DO IGUAÇU | PARANÁ | BRASIL

Realização:



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

*Palestrante:*

**Fábio Souza**



AGENDA LATIN.SEC



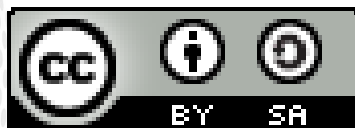
HACKATHON  
LATINOWARE 2019



Latinoware EDU

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

**Por Fábio Souza**



Esta obra está licenciada com uma Licença [Creative Commons Atribuição-CompartilhaIgual 4.0 Internacional](https://creativecommons.org/licenses/by-sa/4.0/).


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



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



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

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

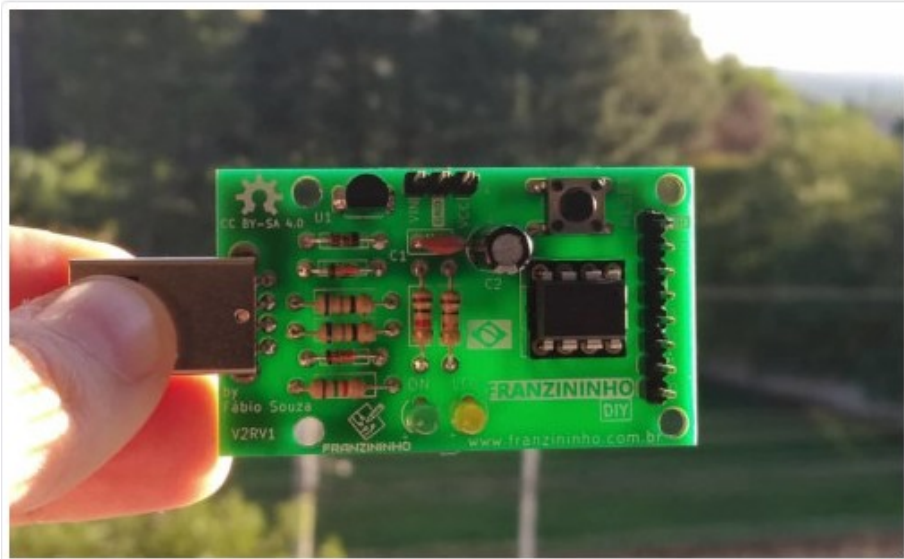


# Franzininho

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

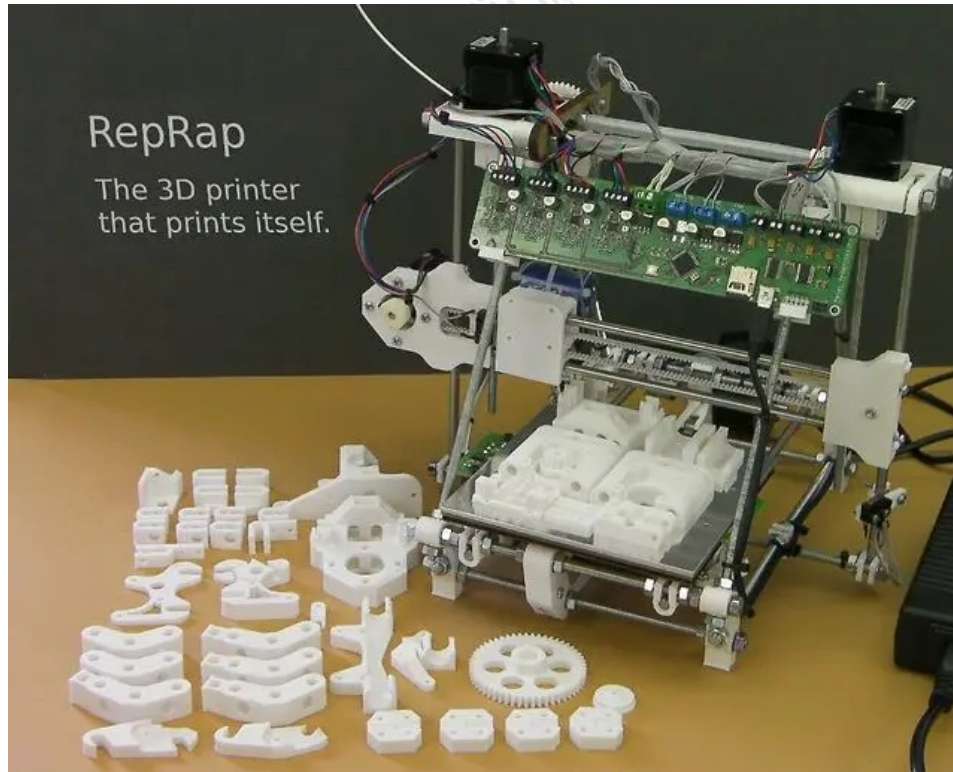
DIY – Faça você mesmo

Criação

Compartilhamento na internet

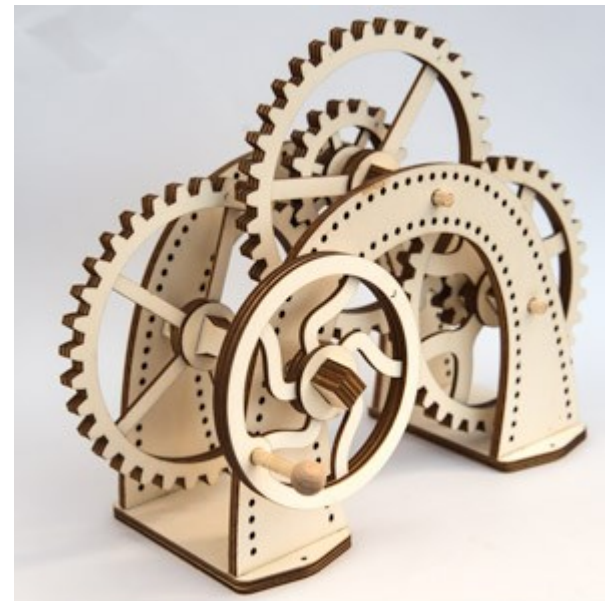
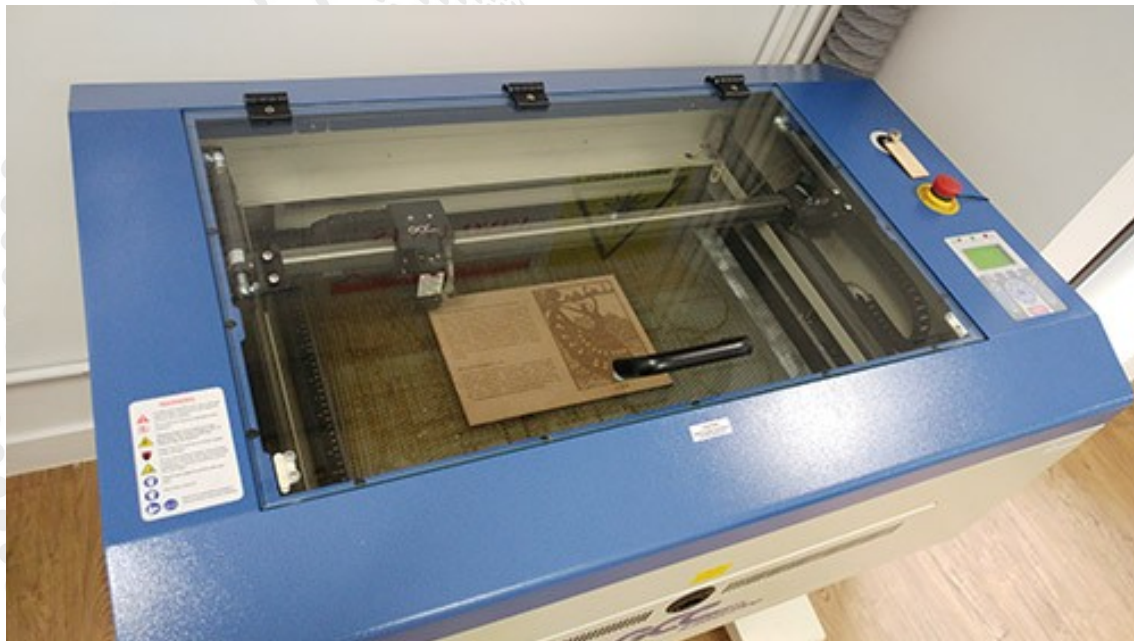


# Impressão 3D





# Corte a Laser

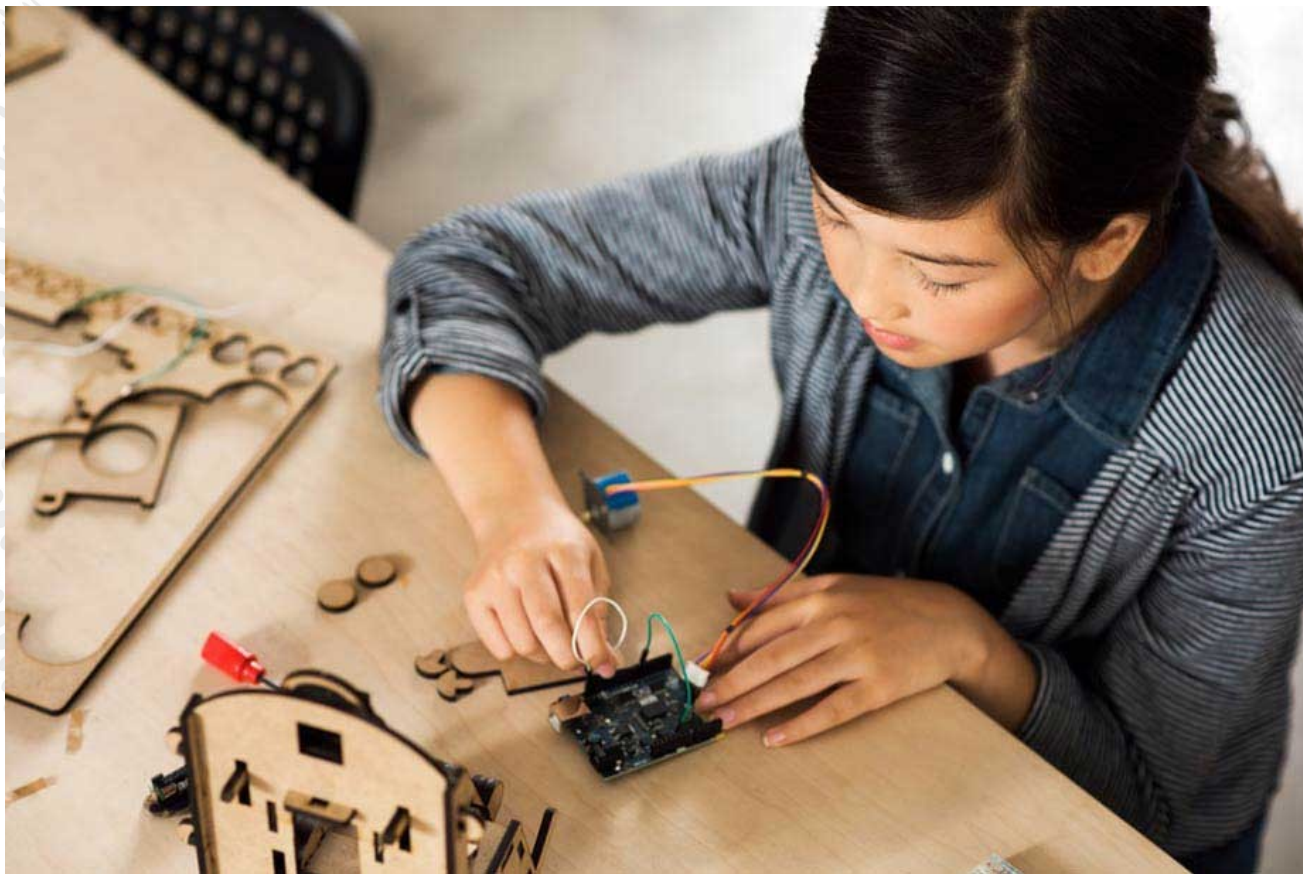




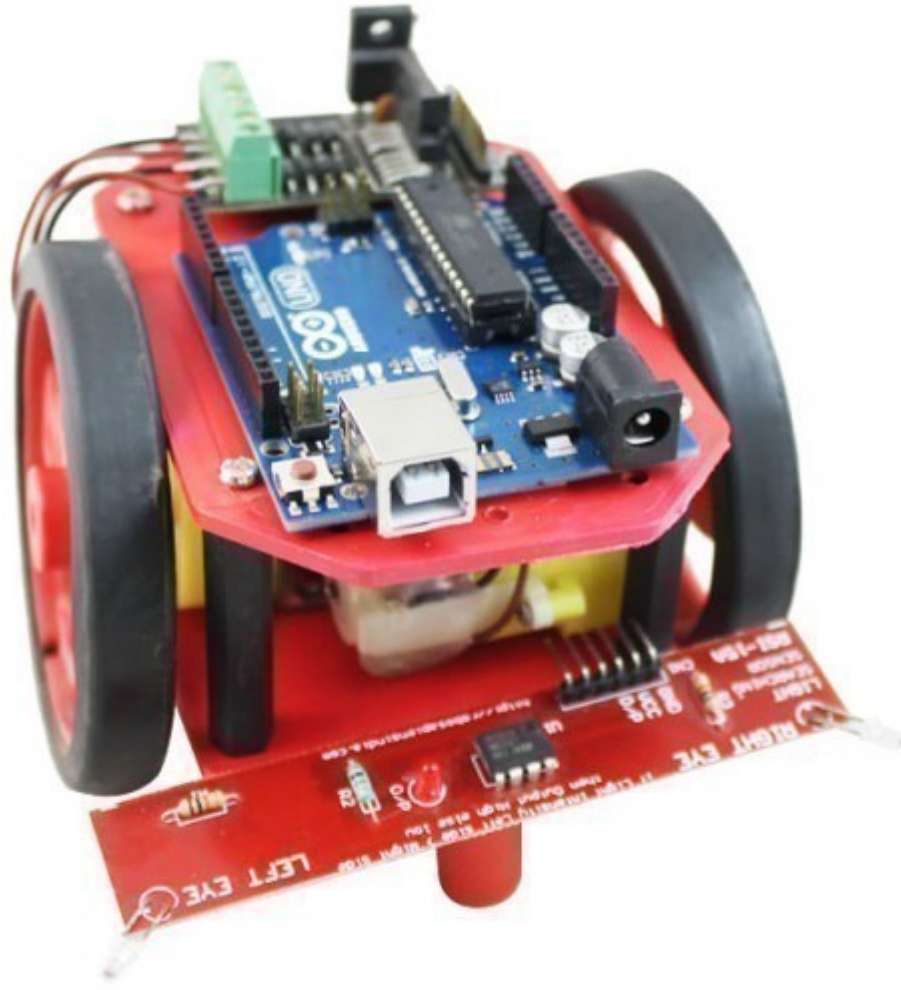
# Marcenaria



# Eletrônica



# Robótica





# Internet Das coisas



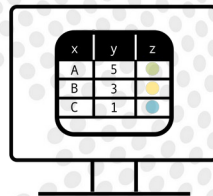


# Fabricação digital

## Digital Fabrication Process

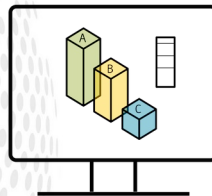
### Input

Spreadsheet



**Bits**

Computer Aided Design



**Bits**

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

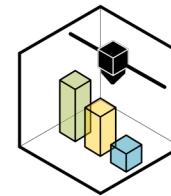
G-Code Generation



**Bits**

Convert CAD outputs into appropriate machine-readable formats

Production

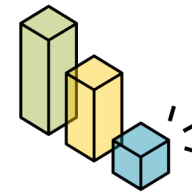


**Atoms**

Craft the physical objects, using additive or subtractive techniques

### Output

Physical Object



**Atoms**

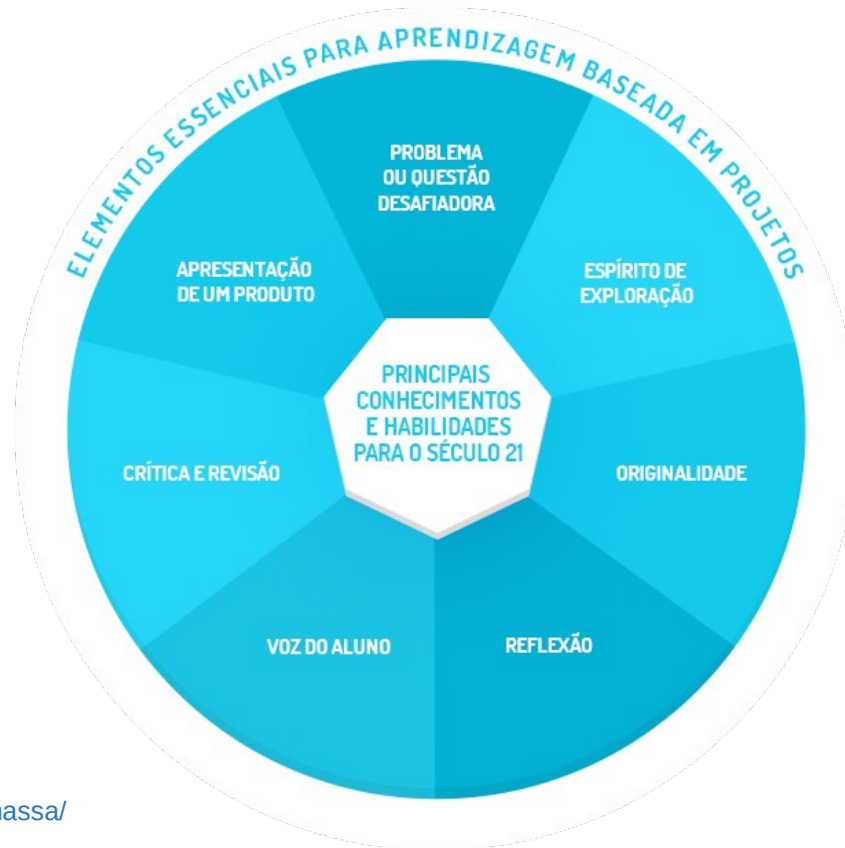
# Fablabs e Makerspaces





# 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



# 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

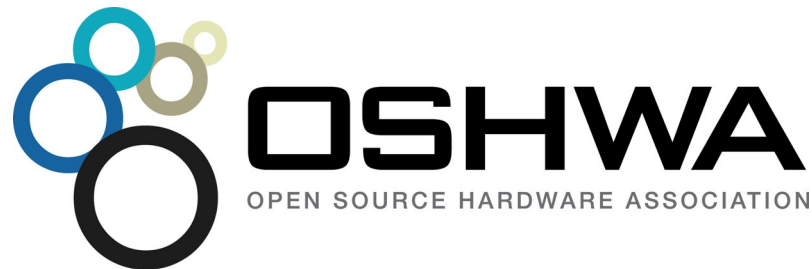


**open source  
hardware**

# 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

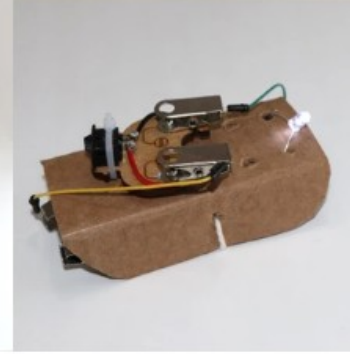
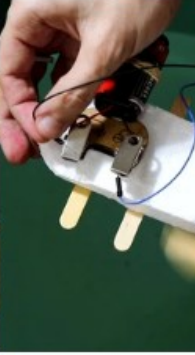
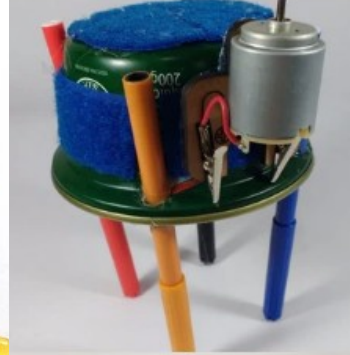


# Rute



<http://rute.io/>

# Scopabits



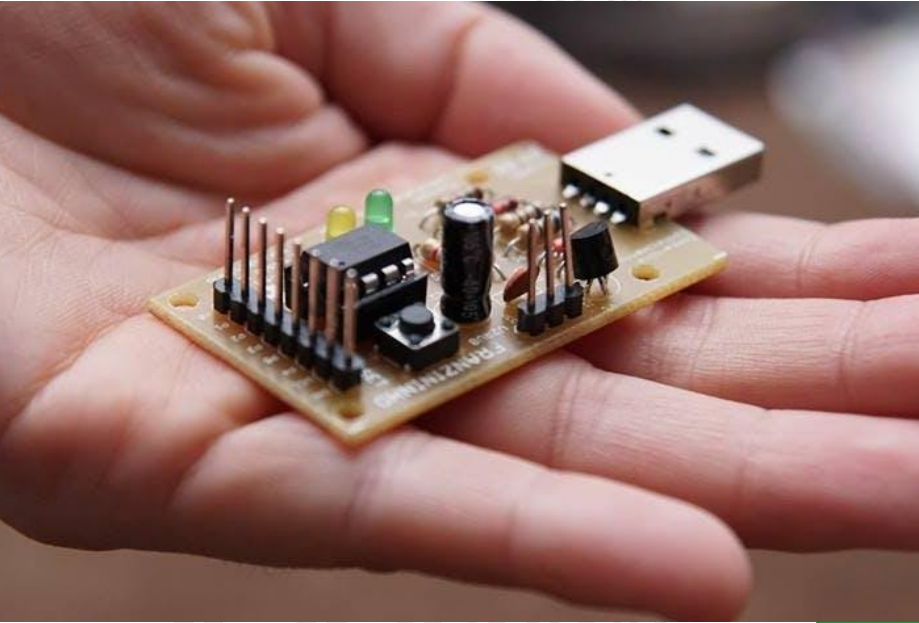
<http://scopabits.mystrikingly.com/>

# Mauablocks





# Franzininho DIY



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

# Como então aproveitar tudo isso na educação?



# Materials 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. A user profile icon and the text 'Following' are on the right. Below the navigation bar is a header section with the Instructables Teachers logo, buttons for 'Projects' and 'Community', and links for 'CONTESTS', 'CLASSES', and 'PUBLISH'. A search bar with the placeholder text 'Let's Make...' is also present. The main content area features a large banner image of two children wearing safety goggles and conducting a science experiment. Overlaid on the banner is the text 'A PROJECT FOR EVERY LESSON' and 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 is a row of five colored buttons representing grade levels: 'GRADES K-2' (purple), 'GRADES 3-5' (teal), 'GRADES 6-8' (red), 'GRADES 9-12' (yellow), and 'UNIVERSITY+' (green). At the bottom of the banner area is a row of seven dark gray buttons representing subject areas: 'ELA', 'MATH', 'SCIENCE', 'SOCIAL STUDIES', 'ENGINEERING', 'CODING', and 'ELECTRONICS'. A right arrow icon is visible on the far right of the subject buttons.

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

