Using Open Source Technology in STEM Assignments

Nick West

Free Software

Cheap Generic Hardware

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Nick West's presentation

* tech gets in the way
* lockout screen locks you out and you cannot change the settings
* open source is good

FreeCAD www.freecadweb.org

OpenSCAD

Jay Atwood's presentation

* What is the point of graphing when categorisation is inconsistent (junk vs healthy food classified by students)?
* How does Google come up with the formulae suggestions based on what you type?
* What is the data flow?
* What happens with the data?

Why not use….?

TinkerCAD, Fusion360, Sketchup?

Circuits.IO, Make123

Online solutions can disappear or change to freemium or subscription models

Kicad (www.kicad-pcb.org)

* open-source electronic design tool
* Schematic capture, BOM management???
* Supported by CERN
* It has a steep learning curve - thus not easy for beginners

Fritzing - honourable mention

* can output PCB for "printing" from Fritzing
* But more limited in capabilities than kicad

Laser Cutting - Inkscape

The Digispark

* tiny cheap, integrated USB for programming and debugging
* Of course, its open source

New Requirements

* easier to solder
* forgiving
* fits in the cases (free)
* Original is out of stock

Solving the original problem

* To prevent screen locking we need to press a key or jiggle the mouse every 10 minutes
* Digispark clone solution
* Custom Board
* Fits in case
* Programmed

Solve other problems - obsolete hardware

Schools data loggers are no longer supported by the manufacturer

Advantages

* cheap
* free lessons to educate yourself
* Sparkfun
* Madmaker

You need a PC with admin privileges

E.g. your Nan's old laptop