Contents



LENS

18 Best maker tech
The ultimate toys to improve your making

28 How I Made: Cocktail machine
Let an Arduino mix your drinks this Christmas

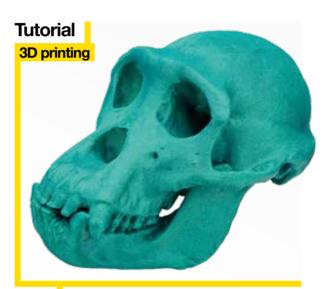
36 Interview: Jude Pullen
Why single-use vapes portent the apocalypse

44 Objet 3d'art
A mechanical computer made of plastic

46 Letters
The youth of today







Browse the Natural History Museum from the comfort of home





It's like the Beastie Boys told us – you've got to fight for your right to repair



FORGE

50 SoM Modular Pico

Add MIDI input to a DIY synth

Tutorial Raspberry Pi
Do more with a Raspberry Pi Camera Module

Tutorial KiCad
Explore difference PCB substrates

Tutorial 3D printing

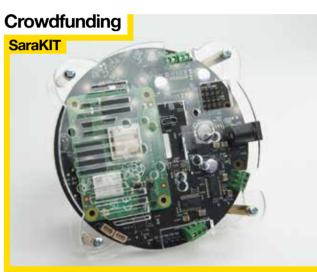
The ethical way to surround yourself with skulls

Tutorial Camera modification
Use new tech to restore old tech

72 Tutorial Hull Pixelbot A robotic programming platform

Tutorial Bike lights
Stay safe with RGB LEDs





Break out the power of the Raspberry Pi Compute Module



FIELD TEST

86 Best of Breed
Circuits to make rockets fly straight and true

Review Porthcurno recycled nylon filament Print with old fishing nets

6 Crowdfunding
Control the way you apply ink to T-shirts

Some of the tools and techniques shown in HackSpace Magazine are dangerous unless used with skill, experience and appropriate personal protection equipment. While we attempt to guide the reader, ultimately you are responsible for your own safety and understanding the limits of yourself and your equipment. HackSpace Magazine is intended for an adult audience and some projects may be dangerous for children. Raspberry Pi Ltd does not accept responsibility for any injuries, damage to equipment, or costs incurred from projects, tutorials or suggestions in HackSpace Magazine. Laws and regulations covering many of the topics in HackSpace Magazine are different between countries, and are always subject to change. You are responsible for understanding the requirements in your jurisdiction and ensuring that you comply with them. Some manufacturers place limits on the use of their hardware which some projects or suggestions in HackSpace Magazine may go beyond. It is your responsibility to understand the manufacturer's limits. HackSpace magazine is published monthly by Raspberry Pi Ltd, 194 Science Park, Cambridge, CB4 UAB, United Kingdom. Publishers Service Associates, 2406 Reach Road, Williamsport, PA, 17701, is the mailing agent for copies distributed in the US and Canada. Application to mail at Periodicals prices is pending at Williamsport, PA. Postmaster please send address changes to HackSpace magazine c/o Publishers Service Associates, 2406 Reach Road, Williamsport, PA, 17701.