

Contents



102

LENS

31

Create a product

Go from prototype to world domination. It's easy!

44

How I Made: Tag jousts

Design and 3D-print a game

50

Interview: Alex Glow

How to make electronics without feeling like a jerk

58

Improviser's Toolbox Concrete

The perfect outdoor build medium for this summer

62

In the workshop

Adding colour with sublimation printing

06

SPARK

06

Top Projects

Wonderful world, beautiful projects

18

Objet 3d'art

Give this idea a big hand...

20

Meet the Maker: Ryan Downes

Zen and the art of bicycle wheel construction

26

Letters

Sympathy for a broken 3D print

28

Kickstarting

Build a supercomputer from Arm boards

Cover Feature

CREATE A PRODUCT

Turn your one-off project into something that people will want to buy

32

Tutorial

Build a swing-wing rocket glider



94

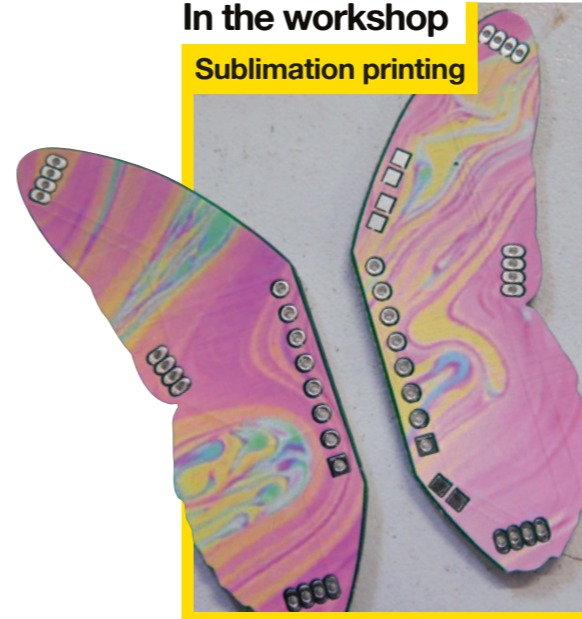
The ideal build for kids who played with Transformers



110

In the workshop

Sublimation printing



62

Liven up your PCBs' boring old solder mask

67

FORGE

68

SoM NeoPixels

Use dithering to control the brightness of LEDs

74

SoM Firefly

Mimic an insect's mating call with Raspberry Pi Pico

78

SoM Raspberry Pi

Read sensors on a Sense HAT with CDP Studio

82

Tutorial Polyhedrons

Use maths and 2D paper to make 3D shapes

88

Tutorial Laser cutter – beyond the K40

We love the smell of burning wood in the morning

94

Tutorial Swing-wing rocket glider

Stick a rocket on a balsa wood glider – to the stars!



18

112

Interview

Alex Glow



50

Make better stuff, in a more sustainable way – here's how

88

101

FIELD TEST

102

Best of Breed

Musical diversions for makers

110

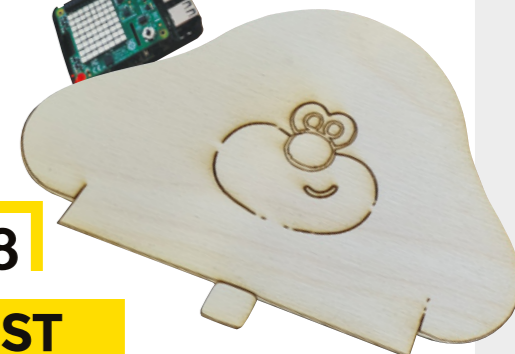
Review Phyx Space Shuttle soldering kit

Your very own PCB Space Shuttle Discovery

112

Review Prusa SL1S SPEED

All the detail of resin printing, with none of the hassle



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, Maurice Wilkes Building, St. John's Innovation Park, Cowley Road, Cambridge, CB4 0DS, 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.