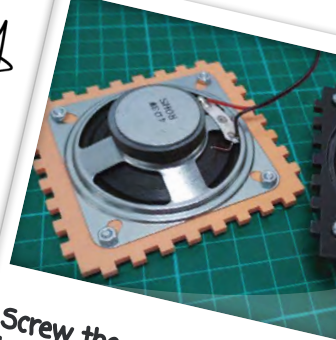




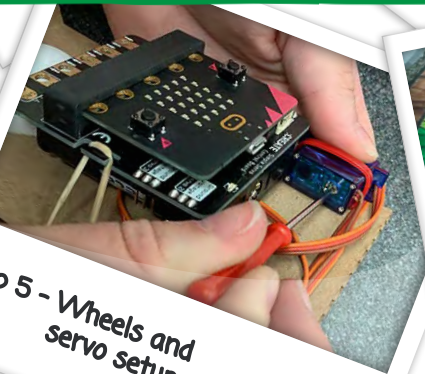
Screw the speakers onto the back of the two



THE KITRONIK

BOOK OF PROJECTS

Volume 1



5 - Wheels and servo setup



Step 8 - Plug In and test



the FREE DXF file



And away we go...

- To the l

Spring 2024

For all your D&T needs!

INTRODUCTION



Welcome to the first in a series of **Kitronik Book of Projects**!

This book is designed to inspire teachers and help them find design and technology projects that are targeted at specific ability levels at affordable prices. We appreciate that the subject is an inspiring, rigorous and practical subject and is aimed at helping students to design, critique, evaluate and test their own creations.

Each project within this book ticks a wide range of curriculum requirements, from design, the use of a variety of materials, use of different hand tools, as well as highlighting more industrial machinery, such as laser cutters and 3D printers.

Each of our projects has an approximate cost breakdown based on the materials used and stocked by Kitronik, and takes an average of 30 students per classroom*.

You can follow our simple step by step guides via our website (QR code and web link supplied) for each project.

We hope you find this booklet inspiring and we look forward to seeing the student's end results!



* Costings accurate at time of printing

Contents:



4	Clocks	22	Steady Hand Game
6	USB Memory Stick	24	Faux Leather Wallet
8	Pull Back Motor Chassis	26	Desk Lamp
10	Edge-Lit Nightlight	28	Sewable Key Ring Torch
12	Temperature Module	30	Solar Powered Jam Jar Light
14	Key Ring	32	3D Printed Rear Bike Light
16	Japanese Landscape	34	Rechargeable USB Torch Kit
18	Flickering LED Tea Light	36	LED Strip Light Stand
20	Clap-O-Meter	38	Bluetooth Amp Module Kit

Icon Key:

DESIGN

Covers design in the curriculum.

MATERIALS

Each make will use either cardboard, acrylic, woods, textiles, 3D printer filament or multiple materials.

TOOLS

Main tools needed will be glue, needle and thread, screw driver, or a soldering iron.

MACHINERY

The main heavy machine used, although some makes may require more than one machine.

DIFFICULTY LEVEL

Overall level of difficulty.

DESIGN



MATERIALS



TOOLS



MACHINERY



DIFFICULTY LEVEL



CLOCKS



Stylish and simple clock designs for your laser cutter

This make covers:



DESIGN



MATERIALS



TOOLS

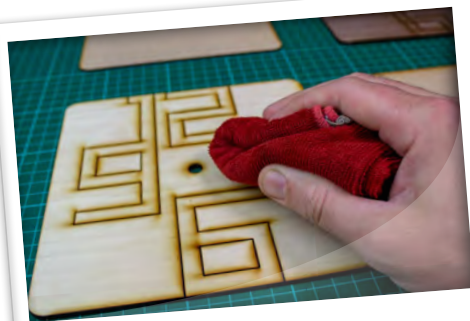


MACHINERY

WHAT YOU'LL NEED...



- ✓ Steamed Beech Veneered MDF/Pine Veneered MDF Code: 3282/32101
- ✓ 3mm laser compatible MDF Code: 3211
- ✓ Quartz Clock Mechanism Code: 2801
- Plus some wood glue and varnish.



A damp cloth takes off the brown scorched edges



Grab your glue and get sticking.



Varnish brings out the deep colours



This is an excellent product to combine a number of natural and man-made materials in an easy and satisfying clock project.



APPROX.
£3.13*
PER STUDENT

DIFFICULTY



*Materials used in the photos are American Maple/Black Walnut MDF, but we suggest using Steamed Beech Veneered MDF and Pine Veneered MDF to reduce costs.

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/contrast-clock



USB MEMORY STICK

Creating a housing to look like sweets

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

These laser cut sweet memory stick cases might just be the tastiest resource we've ever put together.

APPROX.

£4.58*
PER STUDENT

DIFFICULTY



* Based on the Large Lolly casing only, using value acrylic to reduce costs.
Photos use Perspex® Sweet Pastel Acrylic.

WHAT YOU'LL NEED...

- ☒ 16GB Memory Stick
- ☒ Clear Value Acrylic
- ☒ Green Value Acrylic
- ☒ Orange Value Acrylic
- ☒ Yellow Value Acrylic
- ☒ Blue Value Acrylic
- ☐ Plus some plastic glue.

Code: 4115
Code: 43200
Code: 43190
Code: 43192
Code: 43191
Code: 43189



FREE DFX file to download!



Import the design into the
laser cutter

Scan the QR Code or
type in the link below
to follow our simple
online step-by-step
guide and to get full
cost breakdown.



SCAN ME

www.kitronik.co.uk/sweet-USBs



PULL BACK MOTOR CHASSIS

Create a simple but practical chassis

This make covers:



DESIGN



MATERIALS



TOOLS



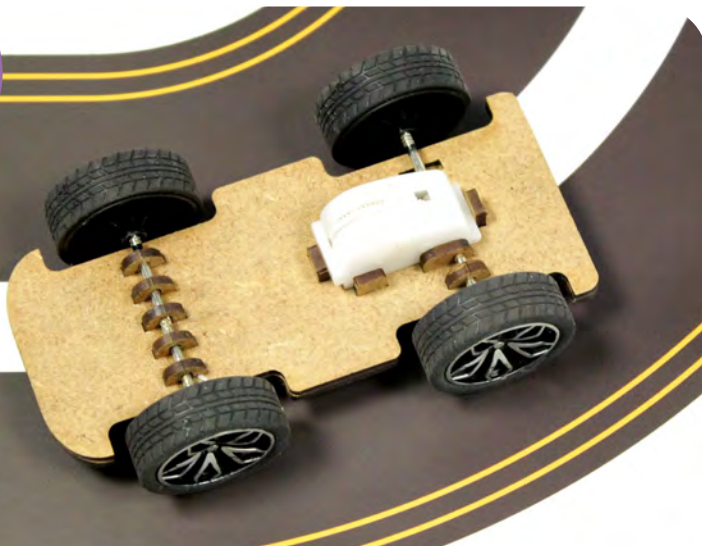
MACHINERY

Channel the toy cars you played with as a child and send your designs racing across the floor, built on top of this simple chassis!

APPROX.

£1.11
PER STUDENT

DIFFICULTY

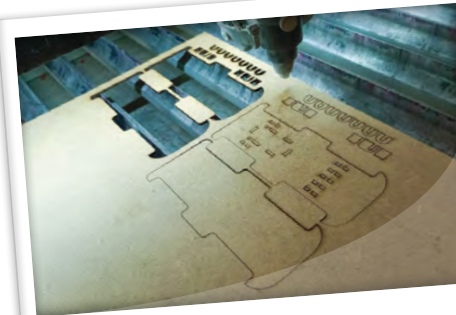


WHAT YOU'LL NEED...

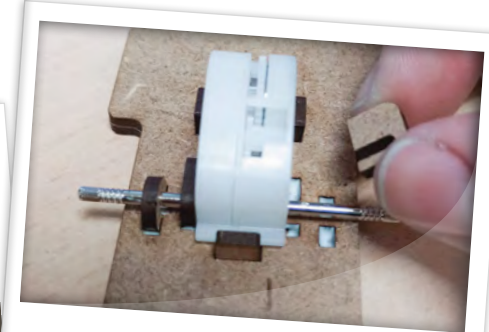
- ☒ Pull back Motor, Axle and Wheels Kit
- ☒ Sheet of 2mm Laser Compatible MDF
- ☒ FREE Kitronik DXF file
- ☐ Plus some wood glue.

Code: 25116

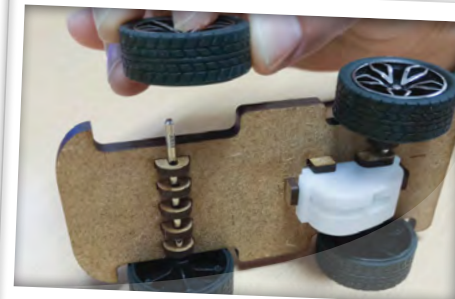
Code: 32179



Step 1 - The laser cutting



Step 5 - Glue the axle tabs



Step 9 - Final assembly



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/pullback-motor-chassis

EDGE-LIT NIGHTLIGHT

Sleeping panda night light design



This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

This is a neat little edge-lit stand for our USB LED Strip with Light Sensor, complete with a tiny sleeping panda!



APPROX.

£2.67*

PER STUDENT

DIFFICULTY



* Using blue value acrylic to reduce costs. Photos use Perspex® Sweet Pastel Acrylic.

WHAT YOU'LL NEED...

- ✓ Blue Value Acrylic
- ✓ 5mm Clear Acrylic
- ✓ Kitronik USB LED Strip with light sensor
- ✓ Plus 1x 6mm M3 flat head screw, 4x 10mm M3 pan head screws, 1x M3 hex nut, 4x rubber feet (optional).

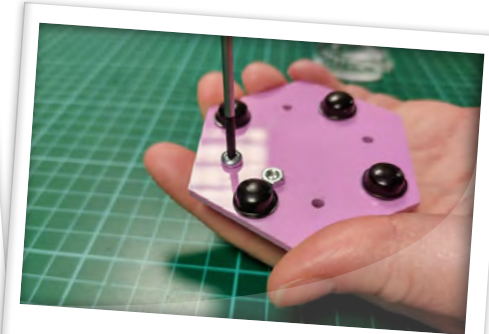
Code: 43189

Code: 43200

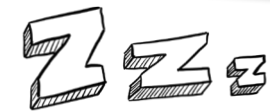
Code: 3562



Step 2 - To the laser cutter



Step 3 - Assembling the Base



Step 4 - Finishing up



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



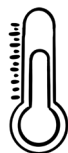
SCAN ME



www.kitronik.co.uk/led-nightlight



TEMPERATURE MODULE



House yours using green Value Acrylic

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

Create a cheery plant surround to hold your Temperature Module and keep an eye on that changing weather.



APPROX.

£2.76

PER STUDENT

DIFFICULTY



WHAT YOU'LL NEED...

- ☒ Kitronik Temperature Module
- ☒ Green Value Acrylic
- ☒ Black Value Acrylic
- ☐ Plus some super glue.

Code: 46176

Code: 43190

Code: 43186



Engrave the inner parts

Laser cut materials



PDF download of the plant

Glue it all into place



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME

www.kitronik.co.uk/temperature-plant

KEY RING

Brighten up that set of old keys

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

Create a beautiful butterfly to brighten up that dull grey set of keys using laserable materials and a split key ring attachment.



APPROX.

£0.24

PER STUDENT

DIFFICULTY



WHAT YOU'LL NEED...

- ☒ Split Key Ring Attachment
- ☒ Black Painted MDF
- ☒ Our Free DXF file
- ☐ PLUS, download your free printable worksheet!

Code: 2291

Code: 32163



Research - What's out there?



Design - Get sketching some ideas



Make your key rings



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/classroom-keyring-makes



3D JAPANESE LANDSCAPE

Using a variety of materials



This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

Create a layered Japanese landscape piece of art using a selection of our veneered MDFs and plywood as well as acrylic sheets.



APPROX.
£2.63
PER STUDENT

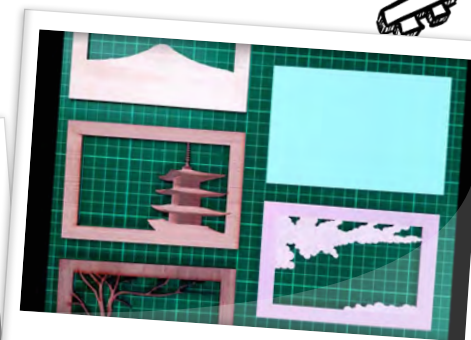
DIFFICULTY



Materials pictured may differ from materials suggested to reduce costs.

WHAT YOU'LL NEED...

- ✓ Veneered Walnut 4mm MDF Code: 3280
- ✓ Veneered Cherry 4mm MDF Code: 3259
- ✓ Ash Veneered Plywood Code: 32122
- ✓ Blue Value Acrylic Code: 43189
- ✓ Baby Pink Perspex® Sheet (Opaque) Code: 43309
- Plus some superglue (WARNING: don't glue fingers to the artwork, you'll ruin it!).



Step 2 - Cut and engrave each layer



Step 3 - Get gluing

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/japanese-landscape

FLICKERING LED TEA LIGHT



Simple but effective!

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

A great way to introduce students to laser cutting using this simple but effective flickering LED tea light.



APPROX.

£0.59

PER STUDENT

DIFFICULTY



WHAT YOU'LL NEED...

- ☒ Yellow Candle LED
- ☒ CR2032 3V Coin Cell, pack of 5
- ☒ 6mm Poplar Laser Plywood, 600mm x 400mm
- ☐ Plus download our simple FREE DXF file.

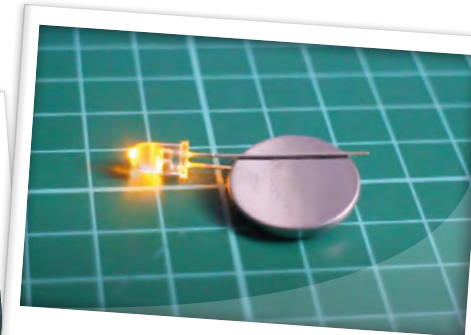
Code: 3590

Code: 2262

Code: 32147



Step 1 - Download the FREE DXF file



Step 3 - Wedge a CR2032 coin cell in the slot



Step 4 - Insert into the slots

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/led-tealight

CLAP-O-METER



Using the Simple Servos Starter Pack for BBC micro:bit.

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

This simple make reads the sound level using the microphone on the BBC micro:bit V2, which will trigger different angles on the servo. Will also cover some basic coding.

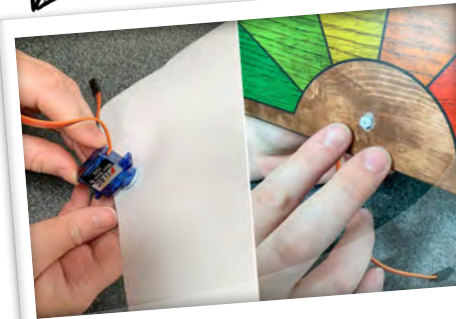
APPROX.
£9.25*
PER PAIR

DIFFICULTY



WHAT YOU'LL NEED...

- ✓ Kitronik Simple Servos Starter Pack Code: 56112
- ✓ BBC Micro:bit V2 (Board Only) Code: 56100
- Plus some cardboard, a ping pong (table tennis) ball, 2x cable ties, an elastic band and some glue or tape.



Code with Microsoft MakeCode

Attach the servo



Attach the pointer



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME

www.kitronik.co.uk/clap-o-meter

* Based on two students sharing and does not include a micro:bit

STEADY HAND GAME

Assemble the kit and build a sturdy enclosure



This make covers:



DESIGN



MATERIALS



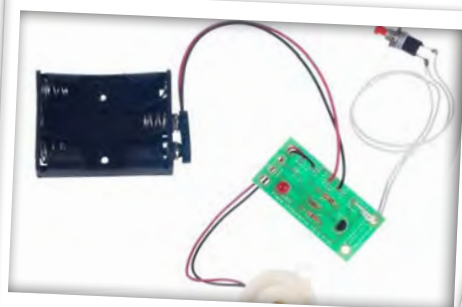
TOOLS



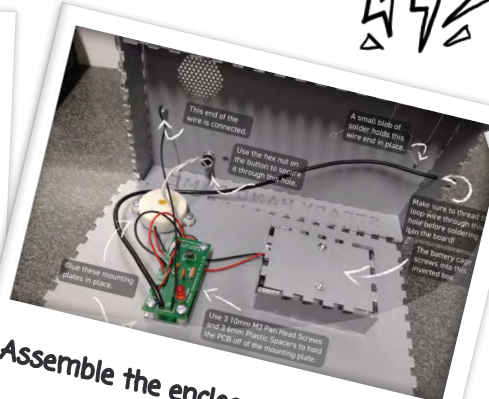
MACHINERY

WHAT YOU'LL NEED...

- ✓ Steady Hand Game Project Kit Code: 2108
- ✓ Black Value Acrylic Code: 4318c
- ✓ Plus some rubber feet, 10mm M3 Pan Head Screws and 6mm Plastic Spacers. Requires 3x AA Batteries, not included.



Solder together the kit



Assemble the enclosure



Stick on the rubber feet and pop in some batteries!

When building a project kit, having an attractive and sturdy case to house it makes the outcome that much more rewarding.

APPROX.
£7.02*
PER STUDENT

DIFFICULTY

2



* Pictured using Silver Mirrored Acrylic. Black Value Acrylic suggested to reduce costs

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/steady-hand-game

FAUX LEATHER WALLET

Stylish and simple card holder



This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

This project demonstrates the versatility of our new Faux Leather, which is fully laserable and engraves like a dream!



APPROX.

£7.80*

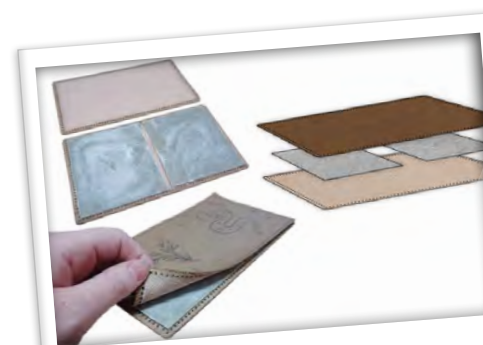
PER STUDENT

DIFFICULTY

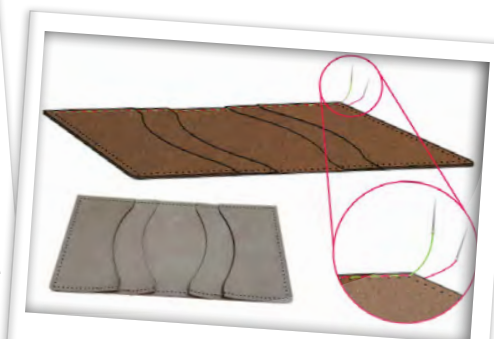
2



* Cost includes optional magnetic fastener



Step 3 - Structure



Step 5 - Sewing

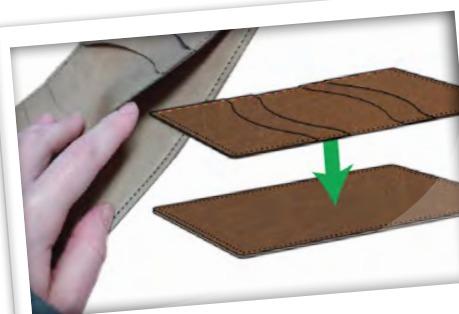


WHAT YOU'LL NEED...

- ☒ Brown Laserable Faux Leather
- ☒ Magnetic Fasteners (Optional)
- ☒ FREE DXF file
- ☐ Plus 2x needles, wax thread and thin card.

Code: 5522

Code: 2755



Step 6 - The edges

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/faux-leather-wallet



WARNING! HOT SURFACES

Kitronik

DESK LAMP

Created by Neve Spurr at Carlton-Le-Willows School



This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

Creating a working desk lamp to light the way on your multitude of ideas and creations.



APPROX.

£2.16*
PER STUDENT

DIFFICULTY



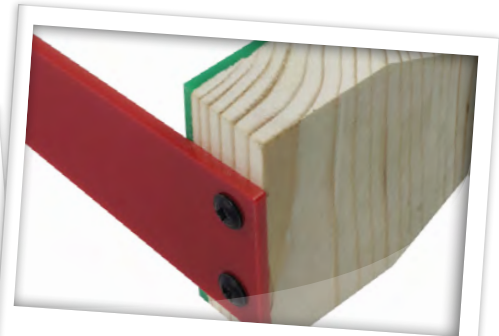
* Does not include wood or screws

WHAT YOU'LL NEED...

- ✓ USB LED Strip Kit with Power Switch Code: 2176
- ✓ Green Value Acrylic 3mm x 600mm x 400mm Code: 43190
- ✓ Red Value Acrylic 3mm x 600mm x 400mm Code: 43188
- Plus some pan head screws and some wood glue, a micro USB power supply and some timber.



Gather the acrylic



Attach the base



Line bend the acrylic

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/desk-lamp

SEWABLE KEY RING TORCH



Using e-textiles, light up the moon

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

Reach for the stars with this simple but effective rocket key ring torch.



APPROX.

£3.98*

PER STUDENT



DIFFICULTY

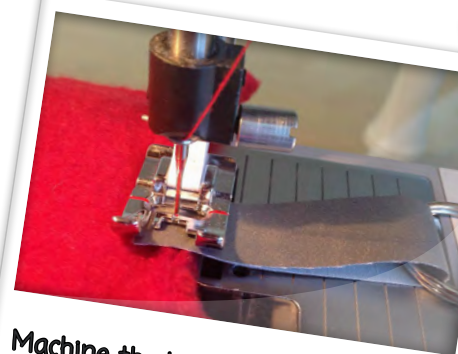


* Excludes stuffing, fabric, tape sew, eyelets, and popper.

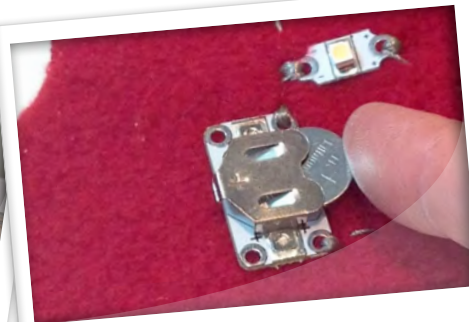
WHAT YOU'LL NEED...



- ✓ Miniature Coin Cell Holder Code: 2718
- ✓ Push Switch Code: 2708
- ✓ 3M per student Conductive Thread Code: 2722
- ✓ Sewable LEDs, Blue, White & Sakuru Code: 2713, 2714, 2726
- ✓ Plus CR1220 3V Coin Cell Battery, 30cm x 30cm fabric e.g. fleece. 10cm of 5cm wide tape sew in reflective tape, 3 metal eyelets, stuffing, small popper and a key ring.



Machine the key ring hanger onto the rocket



Push the cell into the holder



Lightly stuff the rocket to give it shape



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/rocket-keyring

SOLAR POWERED JAM JAR LIGHT

Simple and effective garden lamp



This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

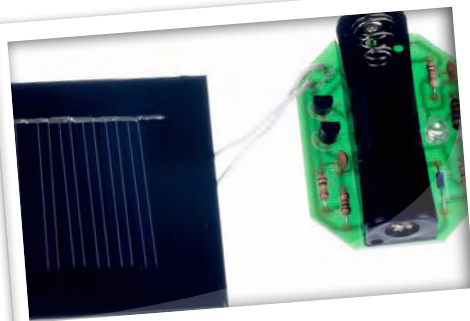
WHAT YOU'LL NEED...

- ☒ Solar Garden Light with Battery
- ☒ Sheet of Transparent Polypropylene
- ☒ Sheet Silver Mirrored Acrylic
- ☐ Plus a jar with a lid wider than the board.

Code: 2134

Code: 43229

Code: 4393



Assemble the Solar Garden Light Kit



Cut the DXF out, and roll them up into the jar



Put in the sun to charge, and you're done



Brighten up the garden using the power of the sun. This solar powered jam jar lamp is simple and effective.



APPROX.
£6.21
PER STUDENT

DIFFICULTY

2



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/solarjar



3D PRINTED REAR BIKE LIGHT



Printed for all to see (at night!)

This make covers:



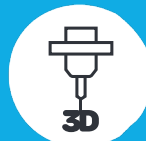
DESIGN



MATERIALS



TOOLS



MACHINERY

WHAT YOU'LL NEED...

- ☒ Kitronik Deluxe Bike Light Kit
- ☒ 4x M3 12mm screws
- ☐ Bring your own bike... (and 3x AA batteries - not included)

Code: 2167

Code: 2311



Step 4 - Fitting The Assembled Rear Bike Light To Your Bike

Go. Go. Go.



Step 3 - Fitting The Rear Bike Light Kit Into The Case

These 3D printed deluxe rear bike light cases have been designed to fit our Rear Bike Light Kit.



APPROX.
£3.25*
PER STUDENT

DIFFICULTY



* Does not include printer filament

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.

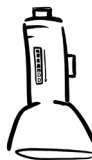


SCAN ME



www.kitronik.co.uk/3dprint-bikelight

RECHARGEABLE USB TORCH KIT



Recharge your own little light source

This make covers:



DESIGN



MATERIALS



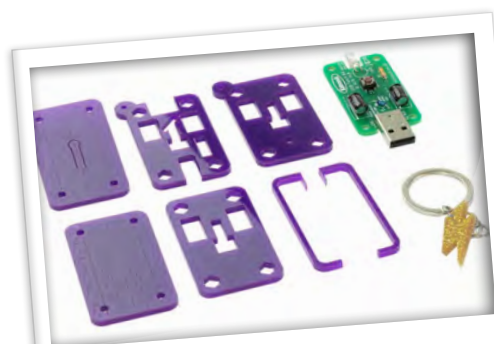
TOOLS



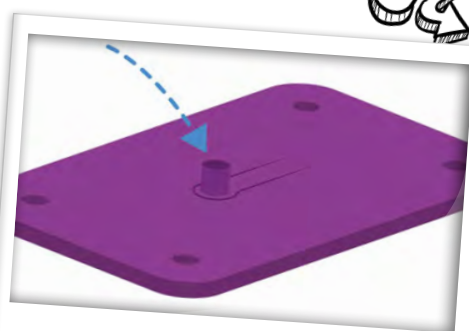
MACHINERY

WHAT YOU'LL NEED...

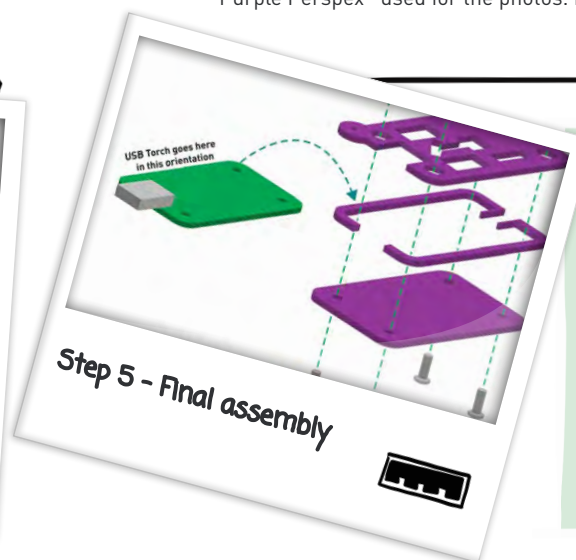
- ✓ Kitronik USB Rechargeable Torch Kit Code: 2178
- ✓ Blue Value Acrylic Code: 43189
- ✓ 3mm Gold Glitter Acrylic Code: 43167
- ✓ Plus 4x 6mm M3 Pan Head Screws, 4x 10mm M3 Pan Head Screws, 4x 8mm Plastic Spacers and a keyring.



Step 2 - To the laser cutter



Step 4 - Switching it up



Step 5 - Final assembly

This is a simple enclosure for you to use as a jumping-off point for your own design or perhaps just for some inspiration!



APPROX.
£4.18*
PER STUDENT

DIFFICULTY

2

* Purple Perspex® used for the photos. Replaced with Blue Value Acrylic to reduce costs.

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/usb-torch-case

5V MINI LED LAMP MODULE



Creating that perfect desk lamp

This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

Keep filling those journals at any time of day, with this lamp module, a perfect desk lamp!



APPROX.

£3.07

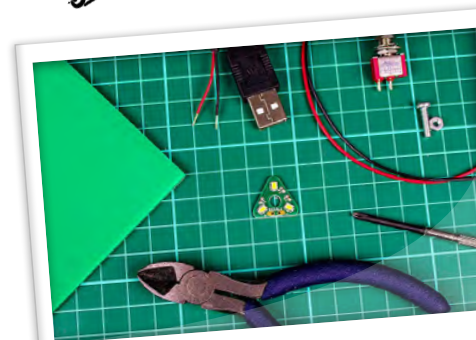
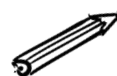
PER STUDENT

DIFFICULTY

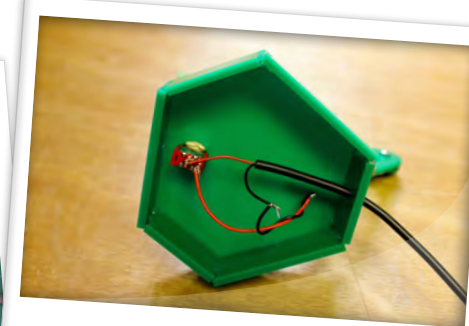


WHAT YOU'LL NEED...

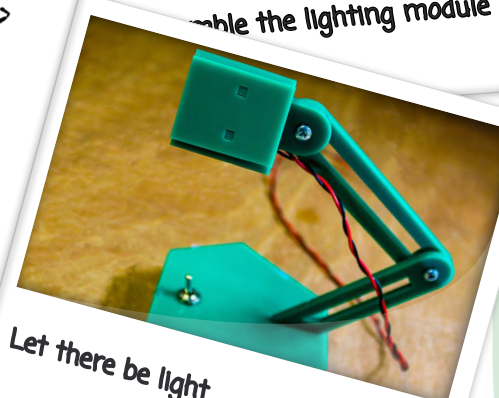
- ✓ Kitronik 5V Mini LED Lamp Module Code: 35137
- ✓ 3mm Value Acrylic Code: 43190
- ✓ USB Power Lead Code: 4101
- ✓ SPST Toggle Switch Code: 3425
- ✓ Plus 12mm M3 Pan head screws x3, M3 Hex nut x5 and our DXF files, as well as soldering iron and solder, wire cutters/strippers and a hot glue gun.



Assemble the lighting module



Attach the power source



Let there be light



Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME



www.kitronik.co.uk/minilamp

BLUETOOTH AMP MODULE CASING

Concert feel at home with this guitar amp build



This make covers:



DESIGN



MATERIALS



TOOLS



MACHINERY

A more advanced make for the Kitronik Bluetooth Amp. Challenge your students using an array of materials.



APPROX.
£15.13
PER STUDENT

DIFFICULTY



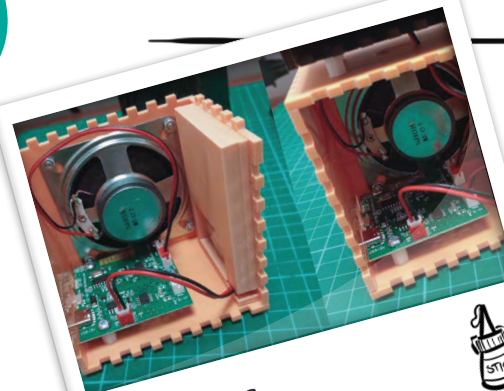
Laser cut the design

Screw on the speakers



WHAT YOU'LL NEED...

- ✓ Bluetooth Amplifier Kit Code: 2182
- ✓ Gold Metalgraph Laminate Sheet Code: 43304
- ✓ Black on White Laser Laminate Sheet Code: 32177
- ✓ Black HIPS Sheet Code: 5711
- ✓ Black Painted MDF Sheet Code: 32177
- ✓ Maple Veneer Sheet Code: 3251
- ✓ Perspex® Sweet Pastels Orange Fizz Sheet Code: 43289
- ✓ Plus 24x 6mm M3 Pan Head Screws, 4x 16mm M3 Pan Head Screws, 12x M3 Hex Nuts, 8x 8mm Plastic Spacers and 4x Rubber Feet.



LAST PANELS

Scan the QR Code or type in the link below to follow our simple online step-by-step guide and to get full cost breakdown.



SCAN ME

www.kitronik.co.uk/amp-enclosures

Hi there, it's Kitronik!

With the New Year, comes our newest!
projects and heaps of kits and materia
something to inspire your next project



FEATURED PROJECT

GUIDE TO ADDITIVE COLOR
To demonstrate the basic concept
behind our TriColour LED strip!



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06

MAKING AN ICE LOLLY EN
This fun enclosure for our new
allows just how eff
acrylics on



ART DECO CLOCK
Create your own Art Deco clock with
Temperature Module using
Metalgraph and acrylic.



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CREATE A LAYERED JAP



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FOR INSPIRATION



r Football Fields



een a version of this football pitch at t
l, or this exact pitch at SETT 2023. Toda
it's made so that you can make your c
of robot football with our: MOVE Moto

CHECK OUT THE BLOG!

THE DXF FILE



When you open the DXF file in your laser cutting so
an outline of the below image - this version is sha
easier to see. This will be cut from the materials sp

HOW TO ASSEMBLE THE PITCH

Follow the instructions in the blog below to mak

