ISSUE 1

openuk zine

The OpenUK open source how to guide

THIS EP

JINGLE G LOVE

CODE, BUILD, CREATE, COMPETE

HOLA! &
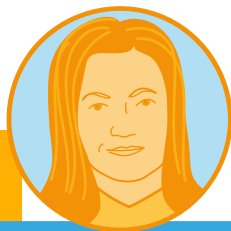
WELCOME TO THE 'ZINE

Amanda, Editor

We've pulled together some interesting content for you, to help you while away the summer hours and to support your learning and play with the OpenUK Special Edition glove. If you haven't registered for a free glove yet, you may still be able to order one at openuk.uk/openkids camp.

Hope you like the way we look! We have our Creative Director Georgia to thank for that. Episode One, is made up of our introductory 'Lesson One' narrated by the generous double Grammy Award-winning Imogen Heap, and this Ezine. We have shared our content " creative commons" so it's open and something you can take and use at your own pace. Our gift to you.

You can even re-use and modify it, but the licence requires *attribution* – don't worry, you'll know all about those by the end of the course. You'll learn a lot along the way, but mostly we hope you have fun. Don't worry if you work at a slower pace than the episode release cycle, you can work at the speed you prefer.

We have a prize draw on page 10. Like the glove kit giveaway, this was sponsored by Huawei. Complete the crossword and word-puzzle and enter to win.

Amanda Brock is CEO at OpenUK

MAKING THE GLOVE

Community Engagement Challenge
20
20 PHASE ONE WINNER 20
Presented by GNOME and Endless

LESSON 1

KEEP IN TOUCH

openuk.uk

TEEN ZINE

Femi

### Your step-by-step guide to coding genius

#01 *RECORD IT!*

Get yourself a really nice book to take notes with. It's really important to keep a personal record of what you are doing as you progress. It helps you to commit information to your long term memory and acts a point of reference to come back to later on.

Use this notebook to write down new ideas, sources of inspiration and things that you learn on your journey. It's really easy to lose information when you write it on a scrap of paper or casually try to remember it, having it all in one book is really helpful.

If you need more than one notebook then you can have different books for different projects or courses, but still have them all in one place so you can easily access and cross-reference them.

Femi Owolade-Coombes, age 14

HackerFemo
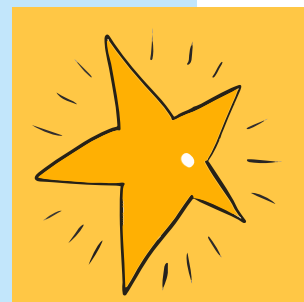
micro:bit WIZARD

Your micro:bit questions answered by micro:bit expert **David Whale!**

David

Q *How old is the micro:bit?*
Lucy (Essex)

A The idea for a new device was first announced on 28th November 2014 **https://bbc.in/33w2leG.**
The name 'Micro Bit' was announced on 12th March 2015, but the device itself looked very different back then! **https://bbc.in/3i5X5Cc.** The delivery of devices to schools started on 22nd March 2016 **https://bbc.in/2DFlDDu.** So, all in all, the micro:bit is about 5 years old.

Q *In the future how small could the micro:bit board be?*
Guy (Perthshire)

A The micro:bit is 52mm x 42mm. Squeezing everything closer together with the edge connector around the whole board, that could be reduced to 42mm x 29mm. Buttons, connectors, and LEDs take the most space – if you took those off, it could be even more "micro" at 18mm x 25mm. Routing the PCB (printed circuit board) tracks would be very hard at that size though.

David Whale is a Software Engineer

PLEASE MISS BOAL

Pamela

GET WITH THE ALGORITHM!

At the centre of the projects which you are undertaking with the MiniMU Glove, is Computer Science. Celebrity and musician will.i.am is quoted as saying "it should be mandatory to learn Computing Science". So, what concepts have you learned about in this first 'Jingle Glove' Lesson?

Sequence is a coding term which describes a basic *algorithm* where a set of steps are carried out in order. Computers need algorithms to solve problems and the algorithm must have the correct order of steps, or *sequence*, to complete the task.

flashing code is language which is used with the micro:bit. This refers to the process of downloading the code which is stored in a .hex file from the coder's device to the micro:bit.

We will look at the idea of .hex files in a later Lesson. Open Source refers to human-readable code which is made freely available on an Open Source Initiative-approved licence, like the MIT one you will see in your Lessons.

The code is shared through public code storage spaces called *repositories*, like GitHub or GitLab where it may be shared and edited by other *developers* or *programmers* (both mean the same thing).

Now that you can explain Sequence, *Flashing code* and Open Source you have taken the first steps on your journey to learning Computer Science. Keep Coding!

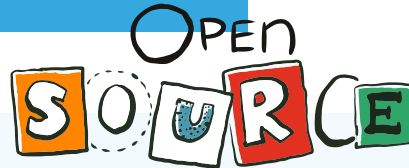**Pamela Boal is an Educationalist**

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INDUSTRY INSIDER

WHAT IS THIS OPEN SOURCE STUFF ALL ABOUT?

Remember how you made your first .hex file while following lesson 1? The .hex file you built was a program. Nice work!

This program made your glove play Twinkle Twinkle Little Star! In industry, companies can sell programs that they make to run within their own products like phones/game consoles/laptops/toys which then do all sorts of cool stuff. Can you think of a few programs you have used at home today?

For a long time, companies tried to create all these programs by themselves. This kind of program-making where the code is not shared on an open licence is called *proprietary* or *closed source* software.

The problem with trying to do everything on your own in industry is that a single company is then limited to what they can create. Because the source code in Open Source programs is on an open licence anyone can share and change it together. In industry, this sharing of the "source code" enables more and more people with many different skill sets to work on even bigger programs collectively.

Open Source is all about communities, sharing a desire to innovate and create together. Our company allows us to participate in these communities, and we get to build programs with loads of creative people.

Mihail Popov is a Software Researcher

OPEN SOURCE HERO

Hello! I'm Helen Leigh, and I designed the MiniMU, a make-it-yourself, gesture-sensing musical glove for children. The MiniMU was a collaboration between Imogen Heap, the MiMU glove team, the super-awesome people at Pimoroni, and myself. I am a creative technologist and a writer, which means my job is to invent and make all sorts of cool things, then write articles and books about them.

I first saw the MiMU glove on YouTube and I got really excited about the idea of making a DIY version so children could make music with code and movement. I couldn't stop thinking about this idea, so I contacted Imogen to ask if she'd mind if I designed a project for young people inspired by their technology. To my surprise, Imogen loved the idea and asked if I could make a prototype for her in time for an event she was running. I said yes, then spent a very busy ten days designing, prototyping

laser-cutting, sewing, coding, testing, and making the first sets of MiniMU gloves.

Once the prototype was ready, we showed it to a lot of people who also loved the idea! So, we got in touch with my friend Paul at Pimoroni to ask if they would be interested in working together to make our ideas and prototypes into a real product.

HELEN LEIGH/ CREATING THE MiniMU GLOVE

Making ten prototypes is a very different process than making a thousand boxed products, so we all agreed to work together to make the MiniMU a reality.

Making the MiniMU was a wonderful experience for me, and I really enjoy hearing from young people and musicians all over the world who have made and played with our musical glove. I hope our work inspires you to get creative with technology – I can't wait to see what you make!
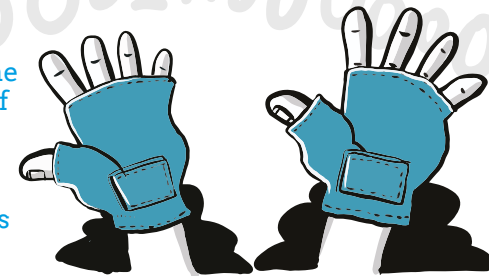
Helen Leigh is a creative technologist and author

WELL BEING

SCREEN TIME & TAKING A BREAK

Matthew

When was the last time you stayed away from your phone, tablet, PC, TV, or any screen for more than 24 hours? Can you even remember?

Adults call you "Gen Z" or "those lucky kids" born after 1995, who've known how to use pretty much any tech device since they were super-young.

Technology can be truly amazing: it allows you to learn, create, and communicate with everybody wherever they are. Let's be honest though, if you spent a little less time in front of a screen, you'd have much more time to play sports, meet friends, read and learn new skills!

Did you know that on average UK kids spend 6 hours a day on their phone?

The truth is, app creators employ top neuroscientists and behaviour experts to ensure you never want to put the phone down. You have to be careful though, because spending too much time in front of a screen is linked to mental health issues like anxiety, depression and loss of sleep.

Luckily, phones now allow you to track your screen time.

How about you try halving it for a week and spend that time to develop your offline passions?

Matthew Springer is a Founder

micro:bit REUSE

Wise words from the bit brain

micro:bit

INTRODUCTION TO THE BBC micro:bit

It's really simple to get started with the micro:bit. Learn about its many hardware features and functions and tell it what to do with code. Create your program in an online code editor and transfer it as a .hex file, the version of your program that your micro:bit can read.
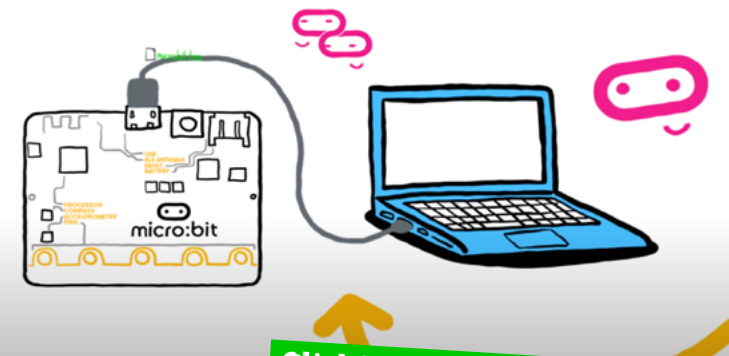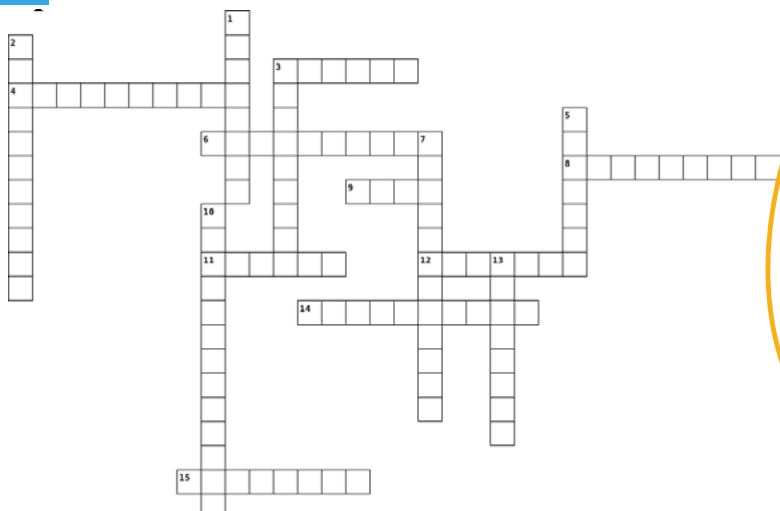
Click here to view the film

Just email your finished puzzles to enter
ezine1@openuk.uk

Crossword courtesy of crosswordlabs.com

Word search

Z	C	H	E	L	E	N	E	Y	J	B	T	I	Y	C
Z	F	O	M	N	Q	J	A	A	I	P	H	N	T	A
O	P	E	N	K	I	D	S	C	A	M	P	S	I	G
N	G	I	I	T	I	Z	I	U	R	Y	A	P	S	I
O	O	J	H	L	R	N	E	E	E	C	Q	I	R	V
O	K	T	O	S	T	I	P	M	H	K	S	R	E	E
K	P	H	E	E	R	O	B	I	A	U	V	A	V	A
G	Y	E	R	B	L	E	E	U	M	R	N	T	I	W
K	L	N	N	E	O	V	D	M	T	E	G	I	D	A
U	E	O	V	U	E	O	E	A	P	I	S	O	K	Y
T	Z	E	V	M	K	R	K	O	E	Q	O	N	R	E
P	D	R	E	E	N	I	G	N	E	L	Y	N	H	P
S	Q	N	Y	G	O	L	O	N	H	C	E	T	J	M
T	T	J	U	I	N	C	L	U	S	I	O	N	Q	A
B	I	N	A	R	Y	Y	C	N	O	I	S	I	V	C

ACHIEVEMENT	BINARY	CAMP
CONTRIBUTION	DEVELOPER	DIVERSITY
ENGINEER	EZINE	GIVEAWAY
GLOVE	HELEN	HOLIDAY
INCLUSION	INSPIRATION	INTERNET
LEADERSHIP	NOTEBOOK	OPEN
OPENKIDSCAMP	OPENUK	PROGRAM
SUMMER	TECHNOLOGY	VISION

Across

3 Name of the make-it-yourself glove kit

4 What is it called when you give others permission to use your source code?

6 List of instructions written by people telling computers how to do certain tasks

8 A group of people sharing the same interests, attitudes or goals

9 Programme instructions

11 Portable computer

12 Format of the file you download to your micro:bit (2 words, 3 letters and 4 letters)

14 Who narrates episode 1?

15 Programmes and other operating information used by a computer

Down

1 Web app you use to drag and drop blocks of code onto

2 The process of writing computer programmes

3 What do you put in the pocket of your glove with the cut out arches under the speaker?

5 Different kinds of permission to re-use code

7 Piece of code that senses that something happens in your micro:bit (2 words, 5 and 7 letters)

10 Working with someone to produce something

13 What is transferring code to your microbit called?

PRIZE

Win a Huawei MatePad T8

HUAWEI MatePad T ⑧
Everything You Need, On The Go

To enter the prize draw you must submit the completed Crossword and Word Puzzle from Ezine1, by email to **ezine1@openuk.uk**. All entries are subject to our terms and conditions which you can read **https://openuk.uk/ezine-1-competit...s-and-conditions/**.
By entering you agree to them and confirm that you have parental or guardian permission if you are under 16 years of age. One winner will be drawn from completed entries received by 10 September. No cash alternative. UK residents only. Judges decision is final. No correspondence will be entered into. Surname and county of prizewinners will be made available on request. Promoter, OpenUK

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OpenUK MiniMU INSTRUCTIONS
LESSON ONE

Amanda has a problem to solve: she desperately wants to dance and perform music on the stage, but cannot play a musical instrument. She has discovered this MiniMU glove and wants some help building and coding it to play music while she dances.

In today's lesson you will help Amanda.

By doing this you will learn:
- [ ] how to sew together your MiniMU glove;
- [ ] how to assemble it and attach your BBC micro:bit;
- [ ] flashing your first program to the glove;
- [ ] using a simple event handler to detect when the glove moves,
- [ ] how to play a jingle of notes using sequences of instructions;
- [ ] You will also learn a little bit about what source code is.

You will need:
- [ ] a MiniMU glove kit;
- [ ] a BBC micro:bit;
- [ ] access to the MakeCode web coding editor;
- [ ] a pair of scissors.

Figure 1: The MakeCode web coding editor
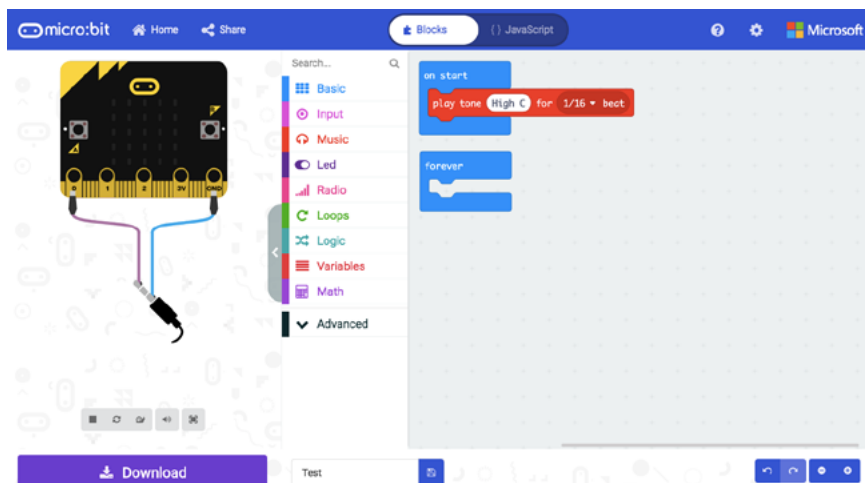
Figure 2: Playing a note when the micro:bit starts

Figure 3: Downloading the 'hex' file.
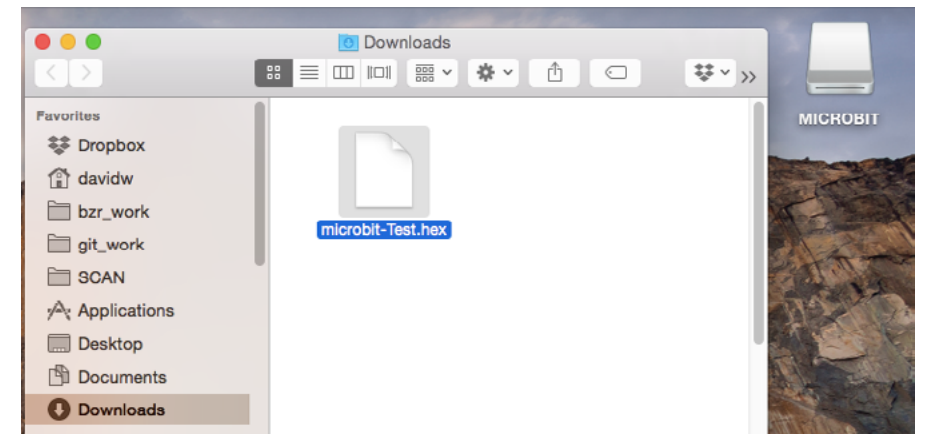
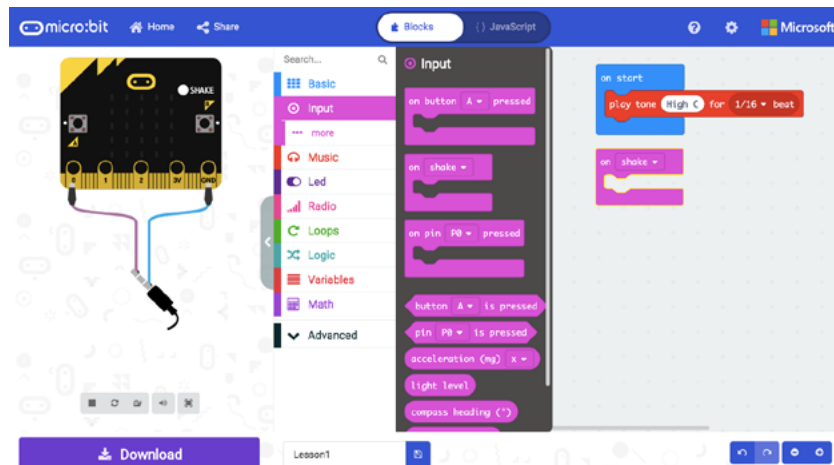Figure 4: Drag and drop hex file to micro:bit drive

Figure 5: The 'input' palette, for the 'on shake' block
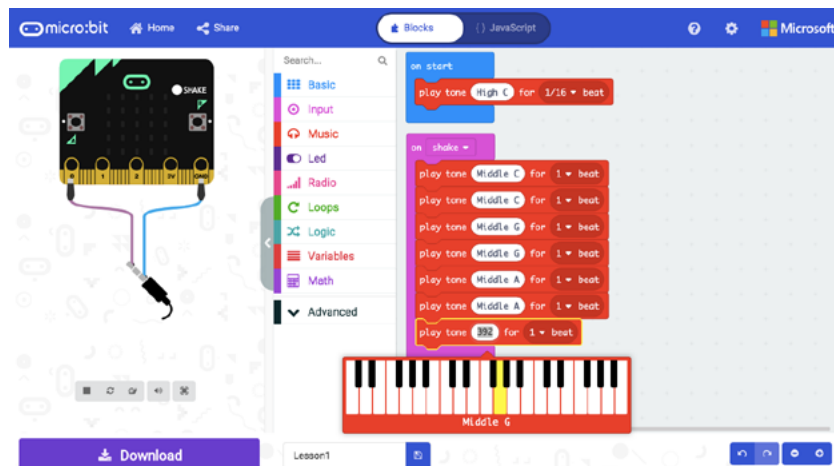
Figure 6: Play a sequence of notes when the micro:bit shakes.