Using the BBC micro:bit within D&T

This guide has been produced by Kitronik, a BBC micro:bit champion
AN INTRODUCTION TO THE BBC micro:bit

The BBC micro:bit project builds on the legacy of the seminal BBC Micro, which was put into the majority of schools in the 1980s and was instrumental in the careers of so many of today’s technology pioneers. The BBC micro:bit, and the wider BBC Make it Digital initiative, aims to help redress the balance of creation and consumption in computing and digital technology.

The BBC micro:bit is a pocket-sized computer that you can code, customise and control to bring your digital ideas, games and apps to life. With 25 red LEDs to light up, simply switch it on, code it, light it up and tell it what you want it to do.

In October your colleagues in ICT will be sent a BBC micro:bit for every year 7 student and they will also get one for the D&T department.

If ICT haven’t registered for the BBC micro:bit register at:

www.bbcmicrobitschoolregistrationform.co.uk
FEATURES OF YOUR BBC micro:bit

BBC micro:bit back
- Processor
- Bluetooth Antenna
- Compass
- Accelerometer
- Micro USB Port
- Reset button
- Battery input

BBC micro:bit front
- Switches
- LEDs
- Pins
Kitronik is one of many partners working with the BBC on the BBC micro:bit project which will give every year 7 student a BBC micro:bit. Just as important as the hardware are the project ideas, resources and tutorials that will allow teachers to deliver exciting curriculum based activities using the BBC micro:bit.

Kitronik will be focusing on the use of the BBC micro:bit within D&T. We have created a range of resources which cover using the BBC micro:bit expansion connector with additional components and also using conductive thread with the BBC micro:bit. These resources give step by step instructions for project kits as well as programming the BBC micro:bit. Kitronik is also supplying free e-textiles kits for use with the BBC micro:bit which include parts for two projects as well as this booklet.
CAD MODEL & 3D PRINTED PARTS

Part of the resources produced for the BBC micro:bit includes a CAD model built in Autodesk Inventor Professional. The files will allow students to build their own cases around the model and visualise them digitally.

Example 3D printable cases and technical drawings are also provided as a resource which can be downloaded at: www.kitronik.co.uk/microbit
FREE E-TEXTILES SAMPLE PACK

We’re proud to be sponsoring the free e-textiles sample pack supplied with this booklet. The pack contains enough components to do two tutorials.

Contents

Each e-textiles sample pack includes:

• 4m Conductive thread.
• 3 White easy sew PCB LEDs.
• 3 White standard through hole LEDs.
• 4 Slim crocodile clips.
• This guide.

Resources

We have used our expert knowledge of educational electronic project kits to deliver some e-textiles tutorials with step by step instructions describing everything a student will need to do to make the project as well as the details of how to program the BBC micro:bit.
Conductive thread sews like normal thread, but conducts like a wire and can be used to connect LEDs, switches, buzzers and so on to your BBC micro:bit, allowing the BBC micro:bit to be placed at the heart of any textiles project.

To make LEDs easier to stitch into position, the legs can be formed into ‘eyelets’. This can be achieved easily by forming to legs of the LED with a pair of long nose pliers. Creating ‘eyelets’ will ensure the thread is securely attached without the possibility of it dislodging.
It is important to create tight and secure connections at the point where the thread attaches to the BBC micro:bit and LEDs. The thread must be attached tightly to these items, so that a good electrical connection is established. Each joint should be stitched through a number of times, each time it should be pulled tight to ensure this is the case.

### LED orientation
- **Must be the long leg of the LED.**
- **Must be the flat edge of the LED.**

### Short circuit
- **Do not allow positive and negative pieces of thread to touch.**

### Loose connections
- **Good, tight connection.**
- **Poor, loose connection.**
CHOOSING AN E-TEXTILES PROJECT

We have produced a number of tutorials that guide you through the process of using the BBC micro:bit in a textiles project, these are ready to print student handouts with step by step guides and templates.

Check out the full range at: www.kitronik.co.uk/microbit

*The emoji bag and pencil case.*
The BBC micro:bit has 5 large pads, which you can connect clip leads to. The BBC micro:bit can then be programmed to respond to inputs or to drive output devices. Why not try our simple tutorial that shows you how to connect a buzzer and then use the on board accelerometer to protect your BBC micro:bit from being stolen!

The step by step guide shows you how to code your BBC micro:bit with the program shown to the left to set up your alarm.
USING THE SMALL PINS ON AN EDGE CONNECTOR

There are 21 unique pins on the edge connector, these include 6 input/output pins, two power pins, the two bottom inputs as well as some more advanced connections. If you want to connect to more than three large ring connectors then you will need to plug the BBC micro:bit into an edge connector socket. There is a datasheet that details the pins and tutorials on connecting other devices like sensors and motors to the BBC micro:bit using the socket.

Collision detection buggy created using the BBC micro:bit.
A Welsh version of this booklet can be downloaded from www.kitronik.co.uk/microbit