Running a Computing/STEM club with the Kitronic LAB:bit primary enrichment tray

Image of Kitronic LAB:bit used with kind permission of Kitronic Ltd

The Kitronic LAB:bit is an excellent resource to help you run a computing club in your school, which counts towards your teach primary computing certificate! Available to loan from your local computing hub so you can try before you buy, the kit extends the capabilities of the micro:bit.

The LAB:bit comes with seven online tutorials. Each tutorial contains a limited number of blocks to support the pupils. When the tutorial is complete, the full block library is shown so pupils can extend their projects.

- Make your own switch
- Making a dice
- Colouring a rainbow
- Traffic lights
- Controlling motor speed
- Scare the micro:bit
- Parking sensors
Make your own switch

Pupils follow the tutorial to create a switch which activates when the A button on the LAB:bit is pressed. Pupils learn about the importance of the pause command, and that a micro:bit can be controlled with an input (press A).

Pupils can then use this to test conductivity. When the two pins for A switch input are connected with an object that conducts electricity, the switch will activate. Pupils can connect a crocodile clip to each of the input A connectors, and test the switch by connecting the crocodile clips with different objects. If the object conducts electricity, the switch will activate. As a challenge, can pupils make the LAB:bit make a noise, as well as flash an image, when the switch is activated?

Making a dice

Pupils follow the tutorial to create a 1-6 dice which activates when the LAB:bit is shaken. They learn to use the sensing capabilities of the micro:bit (on shake) and to use a ‘random’ variable.

Once they have programmed their dice, they could create (or play an existing) game using their LAB:bit dice. There is a snakes and ladders style game in the packs which could be used.

Or, as a challenge, can they use variables to make the same number display on the Micro:bit screen?

Colouring a rainbow

Pupils follow a tutorial to make the ZIP LEDs on the LAB:bit light up in a rainbow pattern. They are introduced to repetition through forever loops, and that computers always start counting from 0 not 1.

Once they have created their rainbow, pupils can change the pattern, colour or movement of the lights. Instead of a rainbow, pupils could create flashing disco lights.

Traffic Lights

Pupils follow the tutorial to create their traffic lights. They are introduced to the importance of sequence.

As a challenge, pupils could code the traffic lights as a crossing. The lights are green, until a button is pressed to tell them someone is waiting to cross. To make this even trickier, they could code traffic light 2 as the one seen by the pedestrian.
**Controlling motor speed**

Pupils follow the tutorial to make the analogue dial control the motor speed. They are introduced to creating their own **variable**.

From here, pupils can create their own Zoetrope. A blank Zoetrope base and sides are included on the USB stick as part of the lesson Speed Control. Instructions on creating a Zoetrope are provided in the kit.

You will need one base and two sides printed onto cardboard per group.

**Scare the micro:bit**

Pupils use the tutorial to create a sound sensor. When the volume gets too high, the image on the micro:bit changes. They are introduced to **selection**.

When pupils have completed the tutorial, challenge them to change what happens when the sound gets too loud. Pupils can use what they have learnt in previous tutorials to help them. Could the traffic light change colour, or the motor speed change?

**Parking sensor**

Using the tutorial, pupils build on their knowledge of **variables** and **selection** to build an ultrasonic distance sensor.

Once this project is completed, pupils could use the ultrasonic piano sheet included in the kit to further build on this. Further guidance on this, including the code, can be found on the USB stick.

**Own project**

Now your pupils are familiar with what the LAB:bit can do, why not give them a chance to design and develop their own project? For example, can they turn their LAB:bit into a measuring device using the distance sensors and LED screen? Or, can they use the microphone input and traffic lights to create a device which tells them when the classroom is getting too noisy?

Instead of opening a pre-made tutorial, pupils will need to open a **new make:code project** and choose extensions. From here, they will be able to add the Kitronic LAB:bit extension, and access all the blocks they have been learning how to use.