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Executive summary - ‘do your :bit’

Do your :bit is a micro:bit global challenge led by the Micro:bit Educational Foundation and supported by British Council.

This competition challenges children to get creative and invent a solution to SDG 14 Life Below Water and SDG 15 Life On Land using the micro:bit. Open to 8-14 year olds.

Children with the winning ideas will be awarded a trip to London with their parent/guardian, funded by the Foundation. There will be 6 regional winners – each from Europe, North America, South America, Asia and Pacific, Africa, and Middle East.

Dates

- Competition opens: 16 September 2019
- Competition closes: 28 February 2020
- Winners announced: 23 March 2020
What is a do your :bit – hackathon?

‘do your :bit’ hackathons are global events to support ‘do your :bit’.

These one-day events are dedicated to celebrating how the world could be improved through design thinking and innovation using the micro:bit as a tool to respond to real world challenges.

This hackathon guide has been co-created by British Council and the Institute of Imagination, a UK charity set up to champion and grow the power that imagination has to foster innovation, develop vital skills for the future and support the well-being of all generations.

We hope this guide serves as a useful suggestion of how to run an engaging hackathon – please feel free to tailor this content to suit your needs.
The aim of hackathons

The aim is to deliver immersive and engaging events to inspire children to get creative and experience the power of learning with the micro:bit.

By hosting do your :bit hackathons we hope to

- raise the profile of the Global Goals
- encourage children to submit entries to the competition
- inspire children, especially girls, towards STEM subjects
- strengthen relationships with local partners in digital education
Hackathon inclusivity

Events for all: these hackathons are designed for both students who understand micro-computing, but also for those children who have not accessed the tools and technologies before and are therefore experiencing the micro:bit for the first time.

Supportive environment: the events should provide supportive environments for children to explore the challenges through immersive and engaging workshops. Look for ways to create an environment that feels inclusive, playful and not intimidating – and is accessible to everyone.

Creative space: Underpinning a successful hackathon is the creative approach to working with children and young people. Participants should be seen as having limitless creative capacity and so the day should facilitate imagination and open ended activity.
Core values

- **Playful**: play nurtures and develops the breadth of skills that enable us to fulfil our potential and to make a positive contribution to our communities.
- **Interdisciplinary**: these events bring multiple subject disciplines together but importantly the subject disciplines can cross over and collaborate (for example technology can fuse with engineering and the arts)
- **Hands on Minds on**: activities require participants to be thinking while doing.
- **Skills development**: activities will enable participants to learn new tangible (e.g. coding) and non tangible (e.g. problem solving) skills.
- **Social good**: the events, by their very nature and content focus, are designed to have positive social impact
The materials you are able to provide during your hackathon are key to encouraging creativity. Aside from micro:bits (children can work in pairs and share micro:bits if necessary) and laptops – additional crafts and tools enable young minds to expand their thinking and prototype their ideas rapidly.

Crafts kit – suggestions (not essential)
- Cardboard: versatile, easy to shape, model and free to upcycle.
- Safety scissors: young people friendly scissors or cutting knives that can cut and shape cardboard.
- Glue guns: enabling quick builds and makes for designs.
- Junk modelling materials: upcycled materials, feathers, corks, lollypop sticks, pipe cleaners, ribbon.
- Cable ties: to attach and join materials.

Tech kit – suggestions (not essential)
- Servos: to bring motion to designs to make simple 90 degree angle turns.
- LEDs: to bring objects to life by lighting up in the dark or to use as warning lights.
- Sound: small attachable speakers, sound can alert and communicate messages.
- Sensors: additional sensors that can bring greater functionality to designs.
Hackathon agenda

See delivery slides here, feel free to save your own copy and amend to suit your event

10.00  Kick off - the challenge for the day: Global Goals
11.15  Break (15min)
11.30  Intro to micro:bit and tools / Making (part 1)
12.30  Lunch (30 mins)
13.00  Making part 2
15.30  Show & tell (parents can join this)
16.00  How to submit your entry, and end of hackathon
How to submit an entry

Children (age 8-14) are encouraged to submit to the online submission form:

Submissions should include:

• A written entry describing what your solution for? Tell us what you have created, why have you created it, who is it for and how will it help your community or another community? (no more than 500 words)

• a paper prototype or a .hex file: For paper prototypes, a photograph of your plans showing how your idea will work. You could draw your solution with notes on how it will work. a .hex file of your prototype micro:bit program.

• optional video - you can also include a video of your device in action (please just send us a video of our invention only).

We encourage all children to submit their idea!
2018 winners and their ideas

AFRICA
Joseph designed a system that detects the temperature of students in a class and lets their teacher know. He designed the device so that students can be treated quickly if they are ill and don’t miss school.

EUROPE
Team Veliki created ‘spine:bit’ - a device that tells you if your posture is incorrect. The micro:bit sits in a lightweight backpack and detects when the wearer is sitting incorrectly and sets off an alert.

ASIA AND PACIFIC
The Food Waste Watchers designed a device that will help to reduce food waste. The device measures the amount of food thrown away and if it’s more than 30g it displays a message to not waste so much food!

NORTH AMERICA
Kathellen noticed that a lot of rubbish was thrown into the rivers in her city. She has designed an ‘anti-trash buoy’ to help keep the rivers clean. The micro:bit uses noise and lights to alert when rubbish is thrown in the river.

MIDDLE EAST
Zayd has created a Doctor robot that helps kids with an illness such as asthma. The robot gives the child medicine on time and contains a dust sensor to alert the child to a dusty environment.

NORTH AMERICA
Elizabeth designed a low cost home security system using the micro:bit. The system detects movement and emits a high pitched noise and displays flashing lights to scare burglars away.
Practical advice for your hackathon

See delivery slides here, feel free to save your own copy and amend to suit your event

Participants
We recommend your hackathon has between 10 and 20 participants.

Educators, mentors and volunteers
You will need at least one educator who has a good understanding and experience of using a micro:bit. In addition it is helpful to have mentors or volunteers who are trained up in using micro:bit. We recommend a minimum of one educator/mentor/volunteer to 10 participants but have more will support your day.

Learning space set-up
The ideal set up for your hackathon should involve a large screen, a communal seated area and a workspace with workshop tables and stalls. You will need a number of ‘stations’ to demonstrate different materials and tools. You will also need an area for participants to place their belongings.

Organiser
Your hackathon will be have a lead organiser who be responsible for planning and running the day. As an organiser you will be responsible for managing a budget for your event.
Intro to the micro:bit

It’s a good idea to help students understand what the micro:bit functions are, so they can invent with a broad range of creative options. We recommend setting up areas of the room displaying different micro:bit demo stations, and letting the students look at each demo – 10 mins in total.

Some demo station suggestions:
- Dice [https://makecode.microbit.org/projects/dice](https://makecode.microbit.org/projects/dice)
- Thermometer [https://microbit.org/guide/temperature/](https://microbit.org/guide/temperature/)
- Music [https://makecode.microbit.org/reference/music](https://makecode.microbit.org/reference/music)
- Tin foil circuit (same as frustration code) [https://codeclubprojects.org/en-GB/microbit/frustration/](https://codeclubprojects.org/en-GB/microbit/frustration/)
- Compass [https://makecode.microbit.org/projects/compass](https://makecode.microbit.org/projects/compass)
- Morse Code [https://makecode.microbit.org/v0/15232-16274-78022-97685](https://makecode.microbit.org/v0/15232-16274-78022-97685)
- Frustration (wire game) [https://codeclubprojects.org/en-GB/microbit/frustration/](https://codeclubprojects.org/en-GB/microbit/frustration/)
...we find the frustration wire game is a fun micro:bit demo to set up for the students, as you can see here – set up on a beach!
Working with your local partners

If you have a local partner capable of co-organising and co-locating the hackathon, then they can register as a do your :bit community partner here (optional).

Partners could include schools, after-school and weekend clubs or youth groups, local universities, training institutions, industry or educational mentors. They also might include existing festivals and events.

Partners can help amplify your impact, by reaching more children through teaching support, or by providing a venue to host your hackathon, or funding the purchase of micro:bits and/or accessories (see materials page 8).

A do your :bit hackathon is a great opportunity to reach out to local environmental organisations and invite them to talk to your students (even just for 15mins) about their work and the importance of looking after our planet.
British Council in Mauritius hosted a do your :bit hackathon and invited a local oceanography institute to talk to the students for 15mins about the problems caused by climate change to the island of Mauritius.
Slides to support your hackathon...

See these delivery slides here
Feel free to save your own copy and amend to suit your event.

Good luck and happy hacking!
**British Council** are founding partners of the Micro:bit Educational Foundation, a UK-based not for profit organisation. We support the Foundation in their vision to inspire every child to create their best digital future.

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**Institute of Imagination** a UK charity set up to champion and grow the power that imagination has to foster innovation, develop vital skills for the future and support the well-being of all generations.

[www.ioi.london](http://www.ioi.london)

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co-created by the British Council
and the Institute of Imagination