# Design challenge

## Overview

In this activity students use the insight, skills and understanding they have developed from the introductory activities to design and create a prototype of their own innovation using micro:bit to address Global Goal 14: Life under water or Global Goal15: Life on Land.

**Activities:**

**Identifying the problem**

* Recap the Global Goal(s) with students and invite them to share what they already know about the problems from their earlier research (slide 2).
* Ask students to consider with a partner the potential problems they would like to address before picking one problem as their focus.
* Give students time, if needed, to do some further research around their problem, before asking them to present their problem to the group.

**Exploring possible solutions**

* Give out large sheets of paper and invite students to write down all the possible solutions to the problem (slide 3). They may have come across some already in their research, or their own ideas. Encourage them to be creative and ‘brainstorm’, not worrying too much about whether the ideas are workable.
* Explain that to enter the **do your :bit** challenge, you would like them to work on an idea that involves using micro:bit to address the problem.

**Exploring micro:bit solutions**

* Ask students to re-look at their ideas and individually, or with a partner, pick up to 3 ideas that could use micro:bit and they could work on (slide 4).
* Give them time to develop their initial idea(s) a little, before asking their classmates to give constructive feedback and contribute to the idea(s).
* Invite students to consider which of their ideas could work best and to select their idea to prototype with micro:bit.
* Ask them to note down the following:
  + What problem their solution is solving.
  + What they will create and why.
  + Who will use their solution.
  + How it will help their community, or another community.

**Do your :bit prototyping**

* Introduce the **do your :bit** challenge to students if you have not already (slide 5).
* Explain to students that to enter the challenge, they need to create and present a prototype of their idea. If necessary explain what a prototype is – there are lots of helpful videos e.g. <https://www.youtube.com/watch?v=JMjozqJS44M>
* Highlight the ways that students can create and present their prototype according to their preference and the available resources (e.g. a paper prototype, a prototype using the micro:bit simulator or a prototype using a physical micro:bit and other materials they wish).
* Ensure they have access to a variety of different materials they need for their prototype and encourage them to get their ideas on paper first (e.g. create a simple paper prototype) before jumping into the code creation. This will enable them to show a variety of people to get feedback and make any necessary revisions.
* Once they have created, tested and reviewed their paper prototype, invite students to program, test and debug their prototype using micro:bit.

**Presenting the prototype and entering the challenge**

* Ask students to revisit their answers to the questions they completed at the start and make any necessary revisions. Explain they will need these to enter the **do your :bit** challenge.
* For inspiration, you can use links on slide 5 to show the winners of the [2018 Global Challenge](ps://microbit.org/global-challenge/winners/) which was the forerunner of **do your :bit**.
* Invite students to visit <https://microbit.org/do-your-bit/> to check the requirements for entering the challenge, including contact details for adults (teacher/supervisor and parent/guardian) and parent/guardian’s consent. (Slide 6)
* Allow students time to complete their entry to submit it to the **do your :bit** challenge (slide 7). Recap that they need to submit:
  + **a written entry** describing what is 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.
  + you can also include a **video** of your device in action if you want to.
* Once students have submitted their entry, you could have a student showcase where they present their designs to the class and evaluate their solutions, awarding your own prizes for the best (e.g. most creative, most likely to succeed, best use of technology, most appealing to the public etc.)

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