Global Challenge

Love Heart

Lesson 2
Learning objectives:

● to understand how technology can help monitor heart rates accurately and conveniently
● to create a prototype micro:bit heart monitor
● to write, test and debug detailed, accurate and efficient algorithms including iteration, selection and variables
Electronic heart rate monitors

- detect and monitor the heart rate
- tell the user what their heart rate is
- helps monitor fitness and progress
  - heart rate gets lower as fitness improves
- help user learn about how their heart responds to different activities
Your challenge

- Design a prototype heart rate monitor using micro:bit
Micro:bit heart rate monitor

- the micro:bit heart rate monitor must:
  - use the **accelerometer** to detect movement of heart
  - give **audio** output of user’s heart rate
  - give **visual** output of user’s heart rate
  - be easy to use
Prototyping

An initial, basic version of an innovation.

It allows you to quickly and easily:
● show how your innovation would work
● test and trial it
● get feedback
● decide what works and what doesn’t
Micro:bit prototype ideas

- our prototype will
  - be able to be attached to the chest
  - detect movement of the heart
  - make a beep in time with heart movement
  - flash LEDs in the shape of a heart in time to heart movement
Paper Prototyping

● On large paper:
  ○ Sketch your heart rate monitor prototype
  ○ Add feature labels and explanations
  ○ Include a detailed, accurate algorithm (pseudocode and/or flowchart)
Sample algorithm heart rate monitor

REPEAT FOREVER
  INPUT sense IF moving
    IF moving, then
      OUTPUT ‘heartbeat’ sound
      OUTPUT ‘heartbeat’ visual
    ELSE, OUTPUT ‘on’ visual

On START
  OUTPUT ‘on’ visual
Iteration
● The repetition of a sequence. Loops are a form of iteration (repeat until a certain condition is met)

Selection
● a decision to be made according to whether a condition is met. e.g. If, then, else

Variables
● used to store information, e.g. light level
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