

“THE LIE DETECTOR”

Subject: Science (Biology)

Level: Sec 2

Unit: Respiratory System

Topic: Skin - Sweat Glands

Summary

Students to create a simple lie detector machine, which works by measuring the electrical conductivity of our skin. On feeling nervous (when someone lies), our skin’s electrical conductivity will increase, and the moisture sensor to detect the changes in humidity (sweat). This allows us to determine if a person is telling the truth or not.

<Please insert a photo here that is representative of the lesson idea. This photo will be used as the thumbnail of the lesson idea when it is posted on the Digital Maker website.>

Prior Knowledge:	<p>Students should already know:</p> <ol style="list-style-type: none"> 1. Logical Operators in Visual Coding 2. Random & IF functions 3. Boolean function
Learning Objectives:	<p>By the end of the lesson, students should be able to:</p> <ol style="list-style-type: none"> 1. Create the lie detector using the “humidity sensor” 2. Test one another on a series of questions to determine if the person is lying

Time	Teacher Activities	Purpose	Resources Needed
Introduction/Pre-activity			
5 mins	Teacher shakes a microbit several times to demonstrate that the image changes with every iteration.	Teacher explains that random objects can form interesting storyline.	Mictobit with a battery supply.
Lesson development/Main activities			
5 mins	Students are grouped in pairs.	Think-Pair-Share.	

Lesson Plan

20 mins	Instruct students to program microbit based on an Initial Reading and 2 IF conditions <ol style="list-style-type: none"> 1. an initialisation value which corresponds to the value when a subject is telling his/her name 2. condition 1: if Test Reading > Initial Reading; show string "Lying" 3. condition2: if Test Reading <= Initial Reading; show string "Not Lying" 	Programming phase.	Microbit Laptop LED (ThinkerAcademy) Humidity Sensor
15 mins	Student 1 & Student 2 alternate between themselves testing the lie detector asking questions and fine tuning the device.	Testing device	
10 mins	Teacher queries if the lie detector can be improved by taking average readings instead of a single reading. Teacher also shows a digram of the sweat gland and skin cross section.	Enhancing program.	
Closure and consolidation/Post-activity			
5 mins	Students are quizzed on other projects where the humidity sensor can be used.	Homework. Creative Thinking	

Please send this template, together with any additional resources, e.g. Powerpoint slides, worksheets and .hex file, to: digital_maker@imda.gov.sg.

Contributed by:

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