**Sensory classroom**

**Lesson 4: Building sensory aids**

**Introduction**

In this lesson students will use their plans from the previous lesson to build their light-pattern based classroom sensory aid including programming the micro:bit. Depending on the complexity of the build and the required level of evaluation this lesson may be extended into another/several lesson(s).

**Time:** @60 minutes

**Materials needed:** Materials to make sensory aids, planning sheets from previous lesson, [MakeCode editor,](https://makecode.microbit.org/)  micro:bit, micro:bit USB connector, micro:bit battery pack, AAA batteries, evaluation sheet(s).

**Learning objectives**

* To follow a design plan to create a classroom sensory aid that meets given criteria
* To follow an algorithm to create a program using inputs, outputs, iteration and selection
* To test and debug code and develop solutions to problems that may arise
* To evaluate the classroom sensory aid effectively

**Lesson summary**

1. Introduction: learning recap (5 minutes)
2. Making and programming a sensory aid (40 minutes)
3. Evaluation and review (15 minutes)

**Introduction: What are we making? (5 minutes)**

* Give students their planning sheets from the previous lesson and allow them to look over their designs, sharing **slide 2** to recap the design criteria if you wish.
* Display **slide 3** and ask students to pair-up with another pair and discuss the questions on the slide.
* Share the learning objectives on **slide 4** if you wish.

**Making and programming a sensory aid (40 minutes)**

* If needed, revisit any concepts or programming skills that your students will need to complete their program (though a ‘tinkering’ and problem-solving approach is to be encouraged). The [**worked example hex file**](https://makecode.microbit.org/#pub:_X1WMUd7yeRPk) is a working program based on the example algorithm in the previous lesson and can be used for further explanation if helpful.
* Give students sufficient time to create their sensory aid from their plan.
* It may be helpful to create a ‘maker-space’ environment within the classroom: zoned so activities and their resources for the different aspects of the build are together.
* If setting up the classroom in this way, use the pupils planning sheets to guide the zones that are required. Typically, these would be: an area with computers/laptops where pupils undertake their programming and receive additional support if needed, an area with paints, markers pens, coloured paper, scissors, paints brushes, etc. where pupils can construct their casing; and an area with adhesive materials and battery packs where children can secure micro:bit and power-supply to their sensory aid.

**Evaluation and review (15 minutes)**

* When students have completed their sensory aid, give them a copy of the **sensory aid evaluation****sheet (slide 5)** online or on paper.
* Ask students to work independently to evaluate their sensory aid. It may be helpful to display the design criteria on slide 2 for them as they complete their evaluations.
* As students are likely to finish at different times, when they finish, ask them to record a short video or screencast to explain and present their product, and/or present their product to another group who have also finished.
* Review learning of the sensory classroom project by inviting students to answer the questions on **slide 6** and recap the learning objectives on **slide 7** if you wish.

**Extension ideas:**

* Each pair could showcase their product to the class and explain how it meets the needs of the user. You could invite a ‘judging panel’ who could award suitable prizes and certificates (e.g. most creative, most helpful to user).

**Differentiation**

**Support:**

* Students can be encouraged to create a simple working program to build their confidence.
* Students can use the **evaluation support sheet** when evaluating their product. Students may benefit from verbalising their responses, which could be scribed or recorded using a microphone or digital device.

**Stretch & challenge:**

* Students will have been challenged to design a more complex sensory aid in the previous lesson which they can build and program in this lesson, including, for example the use of variables. They can also investigate writing their code in JavaScript if they wish.
* Students can be challenged to make more deeply evaluative comments.

**Opportunities for assessment:**

* Informal observation of students’ during activities.
* Formal assessment of students’ programs, products and evaluation sheets.