

Getting active

Lesson 5: Programming an activity picker



Introduction

In this final lesson, pupils apply their understanding of variables and setting random numbers by programming a useful gadget to promote fitness; they explain which outputs in a program are the most and least likely and use their algorithms from the previous lesson to program a micro:bit to help a family select which activity to partake in. After testing their solution, they evaluate their solution to identify its strengths and areas for improvement.

Time: @60 minutes

Learning objectives

- To debug programs involving random number variables
- To write programs that use random number variables
- To evaluate a solution effectively

Materials needed: lesson presentation, printouts of slide 3 and help cards (slides 7 and 8), printouts of ‘evaluating your solution’ worksheet, algorithms and plans from the previous lesson, computers or laptops with access to MakeCode editor, micro:bits (optional), MakeCode project hex files:

- [images predictions](#)
- [activity selector example](#)
- [activity selector support](#)

Lesson summary

1. Introduction: Image predictions (10 minutes)
2. Programing the micro:bit (40 minutes)
3. Evaluating your solution (10 minutes)

Introduction: Image predictions (10 minutes)

- Display **slide 3** and provide pupils with a printout of the slide. Ask pupils to work with a partner to discuss their responses to the questions on the slide (see speaker notes for suitable answers).
- Open the file [images predictions project](#) in the MakeCode editor and invite pupils to use this to provide justifications for their answers when giving feedback to the questions.
- Invite pupils to show how they would debug the program so that each image has an equal chance of being chosen.

Programing the micro:bit (40 minutes)

- Give out the algorithms pupils created in the previous lesson and display **slide 4**. Invite pupils to refer to their work from the previous lesson to recall the problem they were presented with and the solutions they developed including how they intend to use a micro:bit as part of their solution.
- Explain to pupils that they are going to work with their partners to program a micro:bit using the MakeCode editor so it provides a solution to help a family become more active. Remind pupils that they should use the simulator to test their program, testing and debugging as they go.
- Give out sets of **help cards** to pupils (**slides 7 & 8**) and explain that they can use these to help structure their program. Remind pupils that before they can use a variable in their program that they must create one. Invite a pupil to demonstrate how to create a variable. Hints on how to do this are contained within the **help cards**.
- Give pupils time to work in pairs to program micro:bits using the MakeCode editor, following their algorithms from the previous lesson.
- If you have access to physical micro:bits, when pupils are happy that their program works, ask them to download their progra, file and transfer it to their micro:bit to test how it works on the device.

- An example of how the program may look can be found with the lesson downloads and in MakeCode: [activity selector example project hex file](#)

Evaluating your solution (10 minutes)

- Display **slide 5** and explain to pupils that they are going to evaluate their solution to the problem to identify its strengths and the areas that need to be improved.
- Give out copies of **evaluating your solution worksheet** and ask pupils to work with their partners to identify the aspects of their solution that they are happy with and how their solution might be improved. Pupils' improvements should not be governed by their knowledge of how to write the program.
- Invite pupils to share their evaluations with the class. Ask other pupils if they had selected similar strengths/areas for improvement and invite ideas from pupils as to how the identified improvements could be made. (A possible area for improvement could be to remove each activity once it has been chosen and then reset once all the activities have been selected).
- If you wish, use **slide 6** to review the learning objectives of the unit.

Extension ideas

- Pupils could write a set of instructions to allow a family to personalise the device: change the names of the activities that are selected; change the range of numbers from which the random number is selected to reflect the number of people in the family.

Differentiation

Support: Pupils write a shorter program selecting three activities as identified in their planning from the previous lesson. Pupils could be given a scaffolded program ([activity selector support project hex file](#)) to offer further support with writing the program.

Stretch & challenge: Pupils could be challenged to replace the words/images used to communicate the activity selected with a short animation.

Opportunities for assessment

- Informal observation of pupils understanding of how variables are used and their evaluations through class discussions and paired activities.
- More formal assessment of pupils' programs if wished.