National Centre for Computing Education

Raspberry Pi

Year 6 – Programming A – Variables in games

Lesson	Brief overview	Learning objectives
1 Introducing variables	Learners are introduced to variables. They see examples of real-world variables (score and time in a football match) before they explore them in a Scratch project. Learners then design and make their own project that includes variables. Finally, learners identify that variables are named and that they can be letters (strings) as well as numbers.	To define a 'variable' as something that is changeable • I can identify examples of information that is variable • I can explain that the way a variable changes can be defined • I can identify that variables can hold numbers or letters
2 Variables in programming	Learners understand that variables are used in programs, and that they can only hold a single value at a time. They complete an unplugged task that demonstrates the process of changing variables. Then, learners explore why it is important to name variables and apply their learning in a Scratch project in which they make, name, and update variables.	To explain why a variable is used in a program • I can identify a program variable as a placeholder in memory for a single value • I can explain that a variable has a name and a value • I can recognise that the value of a variable can be changed
3 Improving a game	Learners apply the concept of variables to enhance an existing game in Scratch. They predict the outcome of changing the same `change score` block in different parts of a program, then they test their predictions in Scratch. Learners	To choose how to improve a game by using variables • I can decide where in a program to change a variable

	also experiment with using different values in variables, and with using a variable elsewhere in a program. Finally, they add comments to their project to explain how they have met the objectives of the lesson.	• I can make use of an event in a program to set a variable • I can recognise that the value of a variable can be used by a program
4 Becoming a games designer	Learners will take on the role of a games designer. They will work at the 'design' level of abstraction, where they create artwork and plan algorithms. Learners first design the sprites and backgrounds for their project, then they design their algorithms to create their program flow.	To design a project that builds on a given example • I can choose the artwork for my project • I can create algorithms for my project • I can explain my design choices
5 Design to code	Continuing to use the work of games designers as a model, learners implement the algorithms that they created in Lesson 4. In doing this, they identify variables in an unfamiliar project and learn the importance of naming variables. They also have the opportunity to add another variable to enhance their project.	To use my design to create a project • I can create the artwork for my project • I can choose a name that identifies the role of a variable • I can test the code that I have written
6 Improving and sharing	Learners build on the project that they created in Lesson 5. They consider how they could improve their own projects and make small changes to achieve this. Learners then have the opportunity to add a variable independently. Finally, learners evaluate each other's projects; they identify features that they liked and features that could be improved. they identify features that they liked and features that could be improved.	To evaluate my project • I can identify ways that my game could be improved • I can use variables to extend my game • I can share my game with others