

## Start Scratching Session 8

### Description

This session introduces the concept of variables through the specific example of keeping score in a game. The key concepts of variables in Scratch are explored using a simple game.

### How is it tailored for 5-7 year olds?

- The general concept of variables is not developed, rather a readily understandable use case is employed
- Similarly with negative numbers, the specific use case is described (a way to make the score smaller) rather than the general concept
- The game purposely starts in a very simple form that isolates the use of variables, but has many incremental improvements to suit a wide variety of ability

### What is covered

- Variables through a simple game
- Resizing sprites

### Steps

1. **Open a new project, get rid of the cat and choose one of the balls as a sprite**  
The first ball will be the one used to increment the score in the game. Ideally it would be large (relative to the other ball), but resizing will be used if necessary.



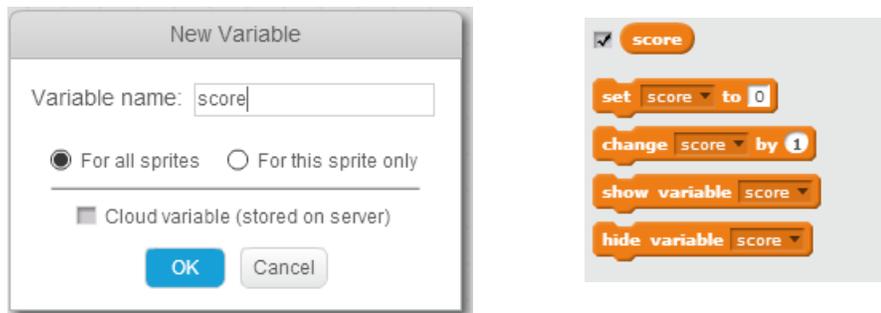
2. **Make a variable**

First click on the 'Data' category, and mention that this is one of the few categories that we have not used yet. Explain that this category is odd, because there are not any blocks in it yet. Point out the 'Make a Variable' button, and explain that we will be making our own block to use as the score in our game.



### 3. Call the variable 'score'

Ask the students to click the 'Make a Variable' button, and type the word 'score' in as the variable name. Ask the students to then click 'ok', and some new blocks for the variable should appear.



### 4. Make the score go up when the ball is clicked

Explain that for our game, we would like the score to increase when the ball is clicked. **Ask the students which of the new blocks we have just created will allow our score to change by 1.** Once the 'change score by 1' block has been dragged out, **ask the students to go to the 'Events' category and find the top hat block that we can use to make something happen when this sprite is clicked.** Have the students click the two blocks together as shown below, and check if indeed the score (shown on the top left of the stage) increases when the ball is clicked.



### 5. Set the score to zero at the start of the game

Explain that we would like our game to start when the green flag is clicked. **Ask the students what the score should be at the beginning of a game. Then ask how we could set the score to zero when the green flag is clicked.** Demonstrate this feature working, i.e. the game starting when the green flag is clicked and the score going to zero.



6. **Create another sprite that makes your score go down when you click it**

Say that our game is much too easy, and to make it a little harder we will introduce another ball. Ask the students to pick another ball as a second sprite. Resize the sprites if necessary.

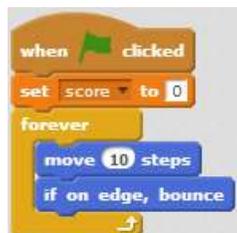


**Ask the students how we can make the score go down by 1 every time the second ball is pressed. This is a very tough question, but it is useful to see if they have suggestions.** Explain that we can make the score go down by putting a minus sign beside the number. Say the '-1' is like the number '1's brother. Changing by 1 makes the score go up by one, changing by '-1' makes it go down by one.



7. **Make the game harder by having the balls move**

Say that the game is still too easy, and ask the students to make the balls move around so that it is harder to click on them. Explain that this game should really be played in 'full screen' mode, because otherwise clicking sometimes causes the sprites to drag.



**Extra Challenge: Add a 'Turn 15 degrees' block to your sprites to make them move all around the screen, making the game even harder.**