

Tackling the Technology Gender Gap Together:

Mary Queen of Bots – Getting to know Kodu

Lesson 1

Level – Second Level

Subject area/s – Computing Science and Social Studies



Mary Queen of Bots Lesson 1 (Getting to Know Kodu)

The theme of this lesson concerns Mary Queen of Scots, but can be easily adapted to any setting, historical or otherwise. For example, if the children are reading Kensuke's Kingdom, you could swap Mary for Michael and have him collect fish, with an angry Kensuke after him. Perhaps you are learning about WW2 and wish to have your Kodu collect coins/shrapnell!

LEVEL-

Second Level

SUBJECT AREAS-

Technologies – Computing Science

Social Studies

EXPERIENCES AND OUTCOMES- Technologies Computing Science and Social Subjects

I can explain core programming language concepts in appropriate technical language. **TCH 2-14a**

I can create, develop and evaluate computing solutions in response to a design challenge. **TCH 2-15a**

I can investigate a Scottish historical theme to discover how past events or the actions of individuals or groups have shaped Scottish society. **SOC 2-03a**

I can discuss why people and events from a particular time in the past were important, placing them within a historical sequence. **SOC 2-06a**

TECHNOLOGIES COMPUTER SCIENCE BENCHMARKS-

- Explains the meaning of individual instructions (including variables and conditional repetition) in a visual programming language.
- Predicts what a complete program in a visual programming language will do when it runs, including how the properties of objects for example, position, direction and appearance change as the program runs through each instruction.
- Creates programs in a visual programming language including variables and conditional repetition.
- Identifies patterns in problem solving and reuses aspects of previous solutions appropriately for example, reuse code for a timer, score counter or controlling arrow keys.
- Identifies any mismatches between the task description and the programmed solution, and indicates how to fix them.

DURATION OF LESSON-

1 hour

COMPUTING SCIENCE CONCEPTS AND APPROACHES-

Programming- this is what we do to create our game. Kodu keeps this simple enough in a WHEN (this) DO (that) format. The screen shots provided in this guide provide examples.

Algorithms- algorithms are the set of instructions that we give to the characters and objects within our game.

Tinkering- children should be given ample opportunity to play around with the Kodu software. This will allow them a degree of freedom and indeed, *inspiration* for their own game designs in lesson 3. The best way to do this would be to allow children to play through the Kodu tutorials found in the Load World section.

Debugging- children will find that (frequently to begin with) characters and objects are not doing what they want them to! This is not the computer revolting, rather an error in the lines of code the children have entered. A vital skill is for children to review their lines of algorithmic code and look for errors. This guide contains plenty of screenshots to show what the code should look like, but by lesson 3 the children will be experimenting and will have to debug by themselves!

PRIOR LEARNING-

Children will have learned about the key events and figures in the life of Mary Queen of Scots in this case. However these lessons can be adapted easily to a range of themes.

OVERVIEW OF LEARNING-

Pupils will become familiar with the Kodu environment and will program a simple 'collect the items' style game, with loose links to the *Rough Wooing*. During Mary's childhood as Queen of Scotland, Henry VIII of England wished to exert control over Scotland. His aim was to marry his son off to Mary, thus making Edward King of Scotland and future King of England. This marked the beginning of a period of aggressive pursuit which forced Mary to flee to France where her family had strong ties. This first lesson introduces learners to the Kodu programming environment and should introduce many key concepts they will use in their own game as part of lesson 3.

PUPIL OBJECTIVES-

We are learning to-

- Add an object
- Program a character to follow keyboard instructions
- Program a character to collect items
- Create a simple scoring system
- Introduce an enemy

INTRODUCTION-

Kodu is a bright and user friendly way to introduce games coding to children. We will be considering ways we can share what we've learned about key events in the life of Mary Queen of Scots in an interactive and exciting way. Kodu contains many tutorials in the Load World section. These could be used as extension activities.

MAIN ACTIVITY-

Introduce the concept that in our game today, Kodu will be playing the part of Mary Queen of Bots. We will already have discussed the concept of the Rough Wooing and why Mary fled to France in her youth. We will be starting simple, then add layers of code until we have a simple game. In our game, Mary will have to collect hearts to escape Scotland, with a slow moving Henry VIII chasing her!

- Open Kodu and from the main menu choose NEW WORLD. You will find a neat green patch of land for your first game. Along the bottom, you will find the icons we will be using to help us code.



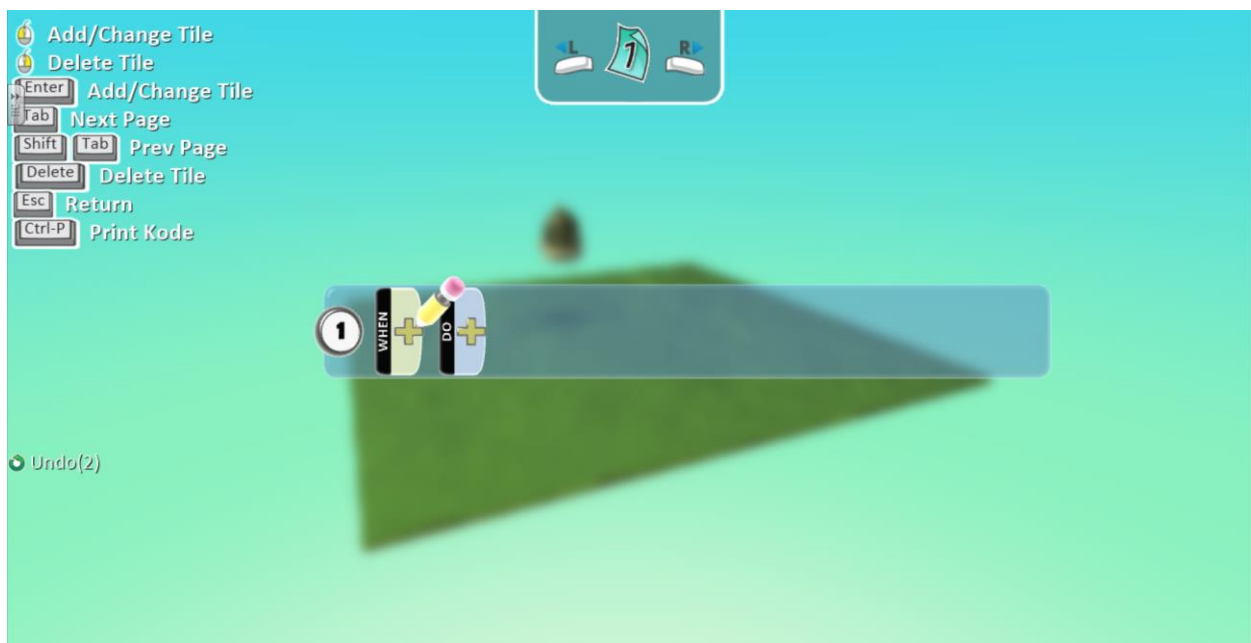
- You will automatically find yourself on the hand (Move Camera) icon. If you look in the top left of the screen you will see a description of your mouse options.
- Now click on the Kodu (Object Tool) icon. He's right next to the hand. This allows you to add objects to your land. Once you've done that, left click anywhere on the land to get the following menu. Go ahead and choose a Kodu. He'll appear on the land!



- Whilst in the Object Tool menu, you have many options. You can move Kodu by clicking and dragging him, or even change his colour!
- At this point, I like to click back on the Move Camera hand, so I can get a better view of Kodu, or in this case, Mary Queen of Bots! If you hover the mouse over Mary, you will get a couple of options. Go ahead and right click to get the following menu. Choose program.

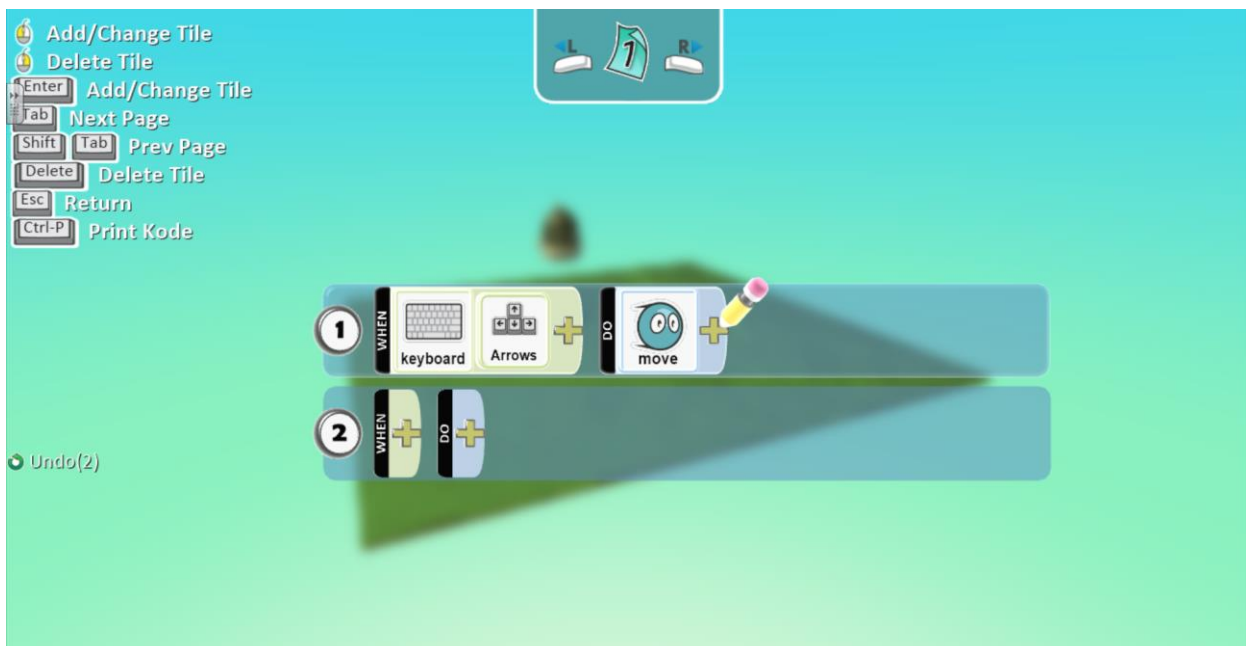


- You will be presented with the following screen, which is the meat and bones of coding Mary.



- We will be adding algorithms, or instructions, based on **WHEN X, DO Y**.

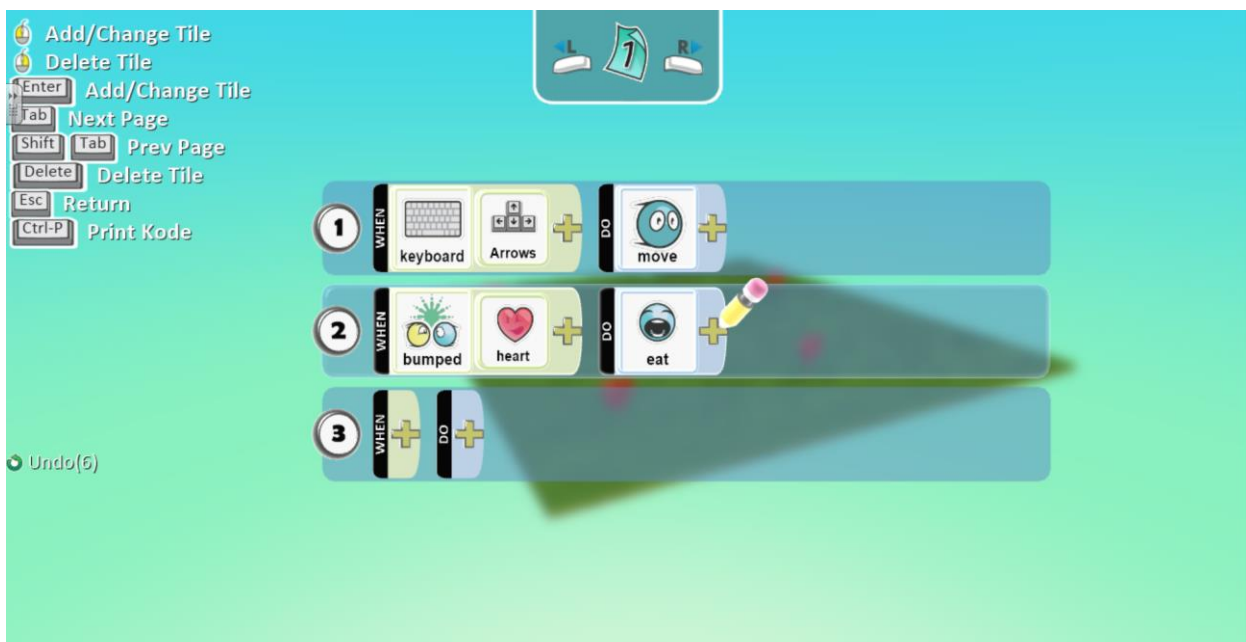
- Click on **WHEN**, and then choose KEYBOARD. Now click on the plus sign on the keyboard tile and choose ARROWS. What you have coded, is *when the keyboard arrows are pushed...*
- Now we need to enter what we want Mary to **DO**. Go ahead and click on the plus sign next to DO. Now choose move. You have now entered *when the keyboard arrows are pushed... move*. Don't worry if you have made a mistake. Ctrl-Z will undo, but you can also delete a tile. To do this, just make sure the pencil is on the tile you wish to delete then hit the delete key.



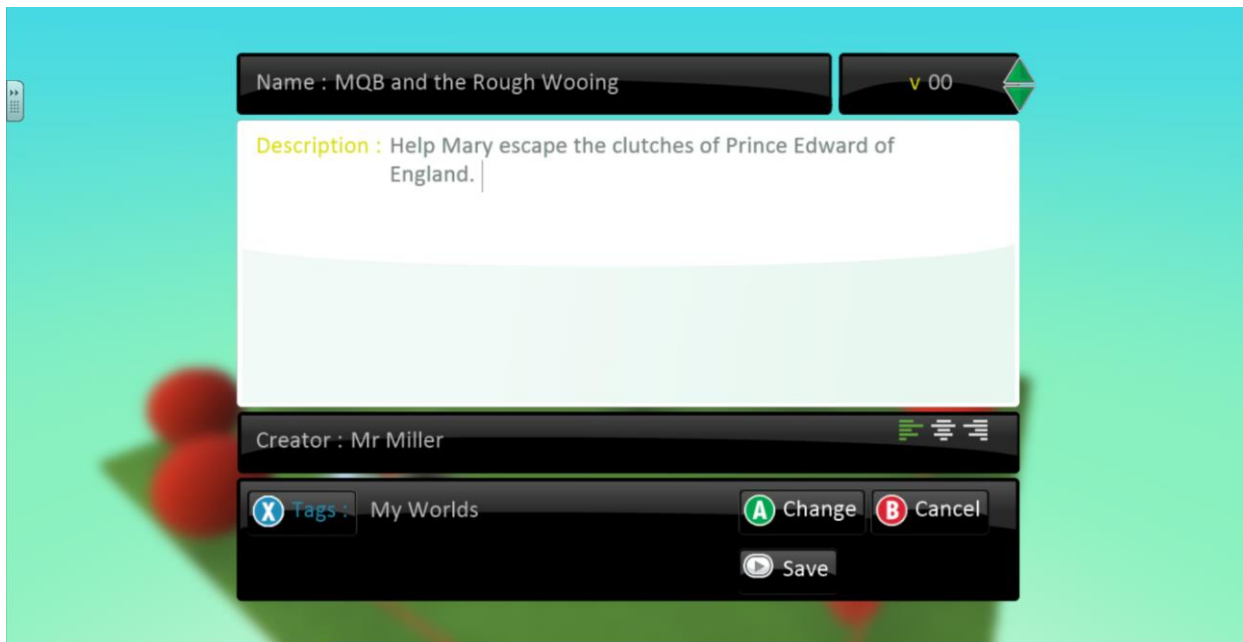
- Now hit ESCAPE to take us out of the program menu.
- On this main screen, hit the play icon to the left of the hand. This will take us into the game. Well done- you've programmed Mary to move when you use the arrow keys on your keyboard! This is, quite frankly, a rubbish game. We need to add objects for Mary to interact with. So press escape to return to the main screen to edit.
- Click on the Kodu (Object Tool) again and click anywhere on the land to add an object. Any option that has the darker green triangle at the end has a sub-menu of more choices! Let's choose the option at the bottom, to get the sub-menu that has hearts and add a heart.



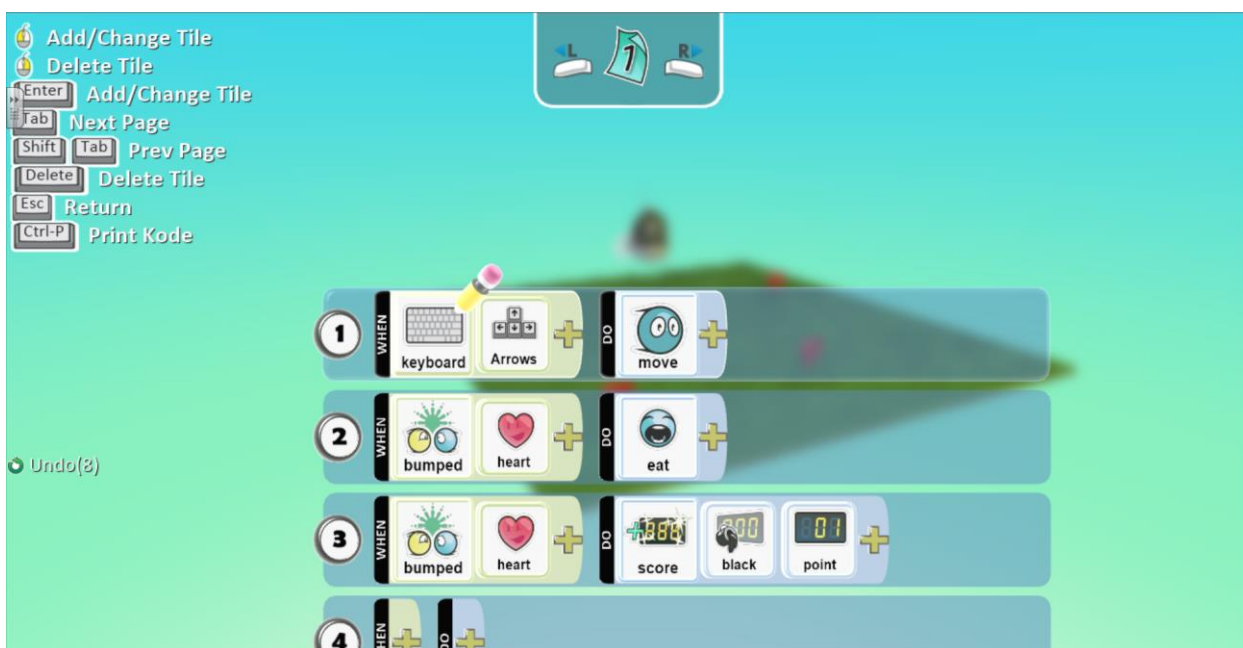
- You should now have a heart on your land that you can move around. Repeat the last few steps to get another 3 hearts on your land. That's 4 hearts in total.
- Now right click on Mary again to PROGRAM further algorithms.
- Choose **WHEN > BUMPED > HEART** **DO > EAT**



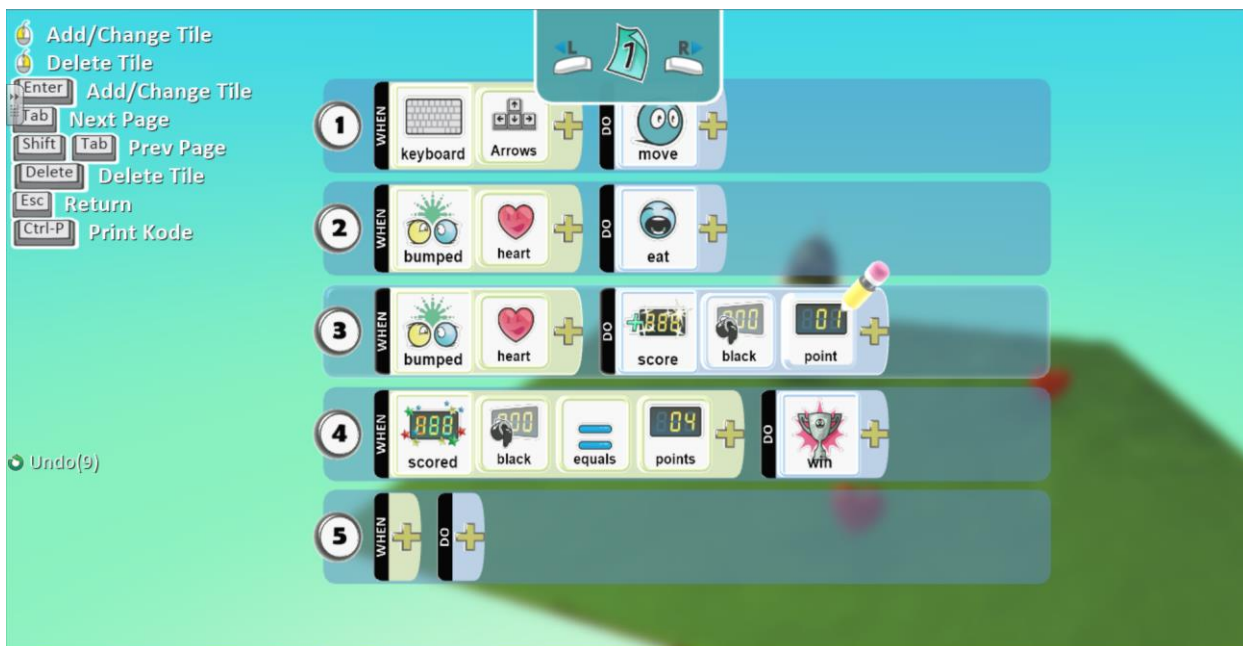
- Choose ESCAPE to return to the main menu, then PLAY to have a go at your game! We are slowly building up a game here!
- Like anything on the computer, we should save regularly. To do so click on the Home Icon at the bottom and choose save my world.



- Now let's give points to Mary every time she eats a heart.
- Escape back to the main menu. Let's choose the Object Tool then right click on Mary to get to the program menu again.
- In a new row of code, enter: **WHEN> BUMP> HEART> DO> GAME> SCORE> BLACK> POINT 1**



- ESCAPE to the main menu, play your game and see how the points rack up in the top right corner!
- So how do we win? We most likely want the game to end when Mary gathers 4 hearts. Then she can escape to France.
- Head back into the program menu. In line 4, we will enter the following algorithms:



- This means when we have scored 4 points, the game is over and we've won!
- Now I want to program a baddie for the game. Select the PATH TOOL, which is the blue one to the right of the OBJECT TOOL. Once selected, if you click on the land, you can add a path. Loop it round your land and right click to end the path.
- Now we need to program Henry VIII to follow this path.
- Now we want to add in a bad guy who will try to stop Mary. Let's call him Edward.
- Choose the object tool to add a new character to be Edward. I've chosen a cycle. Remember, While on the Object Tool icon, click anywhere on the land to add an object. I chose a Cycle.

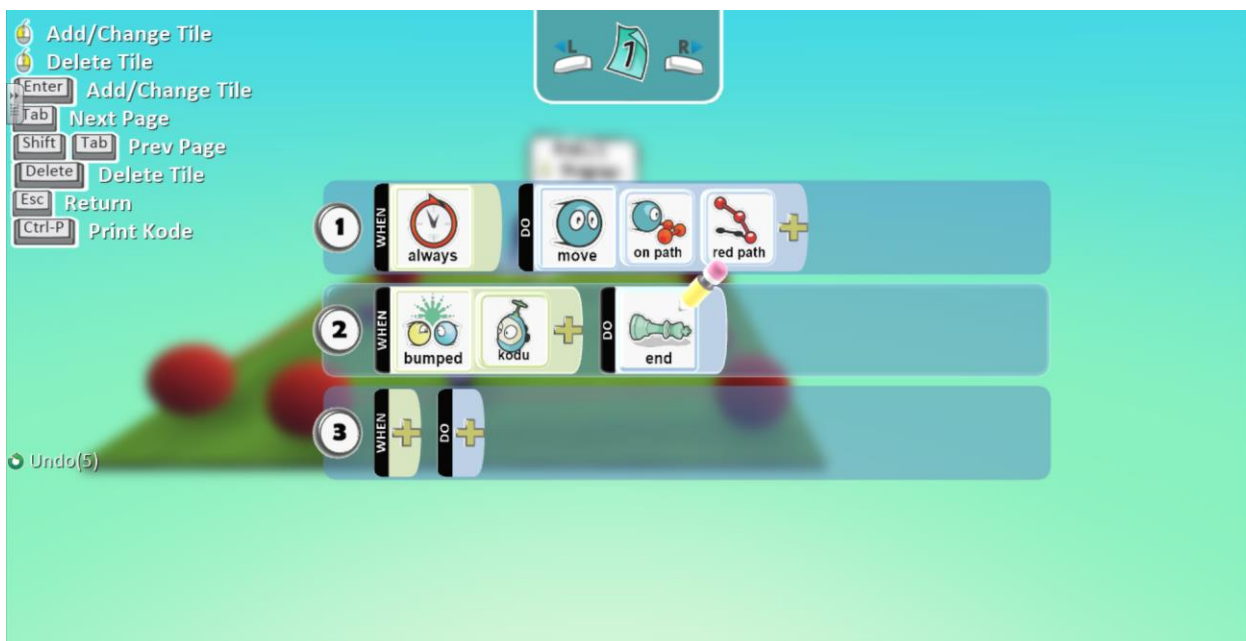


- He was initially too big, so by right clicking I have the option to change his SIZE and make him smaller.

- I want to make Edward follow a path. To do this I use a new icon- the Path Tool. It's to the right of the Object Tool. Click on this icon to select it.
- By clicking on the land with the left mouse button, I will add a path. To end the path I click with the right mouse button.



- By hovering over one of the path nodes, the colour palette appears at the top. Use the arrow keys on your keyboard to change this to another colour- in this case red. You can have different characters following different paths and having unique path colours makes this possible.
- Now we need to code Edward to follow the path- and we want to add an element of danger, so program him with the following algorithms. You'll find always in the more submenu.



- You will now have a simple game that you can win... or lose!

PLENARY-

Reflect on the real Mary Queen of Scot's story. How might skills learned in this lesson be applied to another part of her story? Think about perhaps the murder of David Rizzio, the escape from Loch Leven or even the Babington Plot! Discuss the key concepts of tinkering (playing with the technology), debugging (finding and fixing errors in their code) and algorithms (the steps or instructions in their code).

EXTENSION/TINKERING-

Kodu has a variety of tutorials for extension tasks. Encourage children to start at the beginning though as later tutorials build on prior learning. Allowing children the opportunity for 'tinkering' will supply them with ideas for their own game later on!