Lesson Plan for Scratch Game Balloon Pop

Academy of Code

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1 Balloon Pop Lesson Plan

Students are assumed to have covered basic course in Scratch and have used messages, clones, variables, random, and if statements before. The purpose of the lesson plan is:

- to structure a game to three distinct stage backgrounds: 'game start', 'game play' and 'game over'.
- to use of messages in Scratch
- to use the Vector Graphics editor in Scratch (more control than Bitmap Editor)
- to use clones rather than multiply Sprites
- to use random variables
- to use if statements

Balloon Pop introduces the idea that we can control game play with three distinct screens:

- Game Start
- Game Play or New Game
- Game Over

Game Start includes the user instructions for the game.
Game Play is for the action of the game.
Game Over is to tell the user the game has ended.

First play the game on the Scratch account: GrahamROI and is under the Studio name: Balloon Pop Game.

Write down how the game is played and how you would to make the game yourself in Scratch.

Then check off from the list items you found.

- Three distinct screens: Game Start, Game Play and Game Over
- Background Music
- Each balloon appears at the bottom of the screen at random positions and rises to the top. Various colours, popping a balloon makes a pop noise and also changes to an exploding (star) with text,
- Clicking on the Doom Balloon stops the game.
- You score a point each time click on a Balloon to be 'pop'ed, which is displayed as Score.
- The game ends after so many turns.

Is this list complete ?
Are there any other features you found which are not listed?
Are there other features to this game you would like to add?

Before we start to use the graphics editor you need to make sure that you are using Scratch Vector Graphics Editor over the Scratch Bitmap Editor.

The next section explains the use of the Scratch Vector Graphics Editor.

2 Scratch Vector Graphics Editor

To create more space in the Graphics Editor when working with backgrounds or sprites, then tick under edit "Small stage layout".

The use of Scratch Vector Graphics editor is recommended as you have more control over editing the objects you create.

2.1 Small stage layout

To increase the amount of space available to edit your backdrop and/or sprite, select from the edit menu, small stage layout.
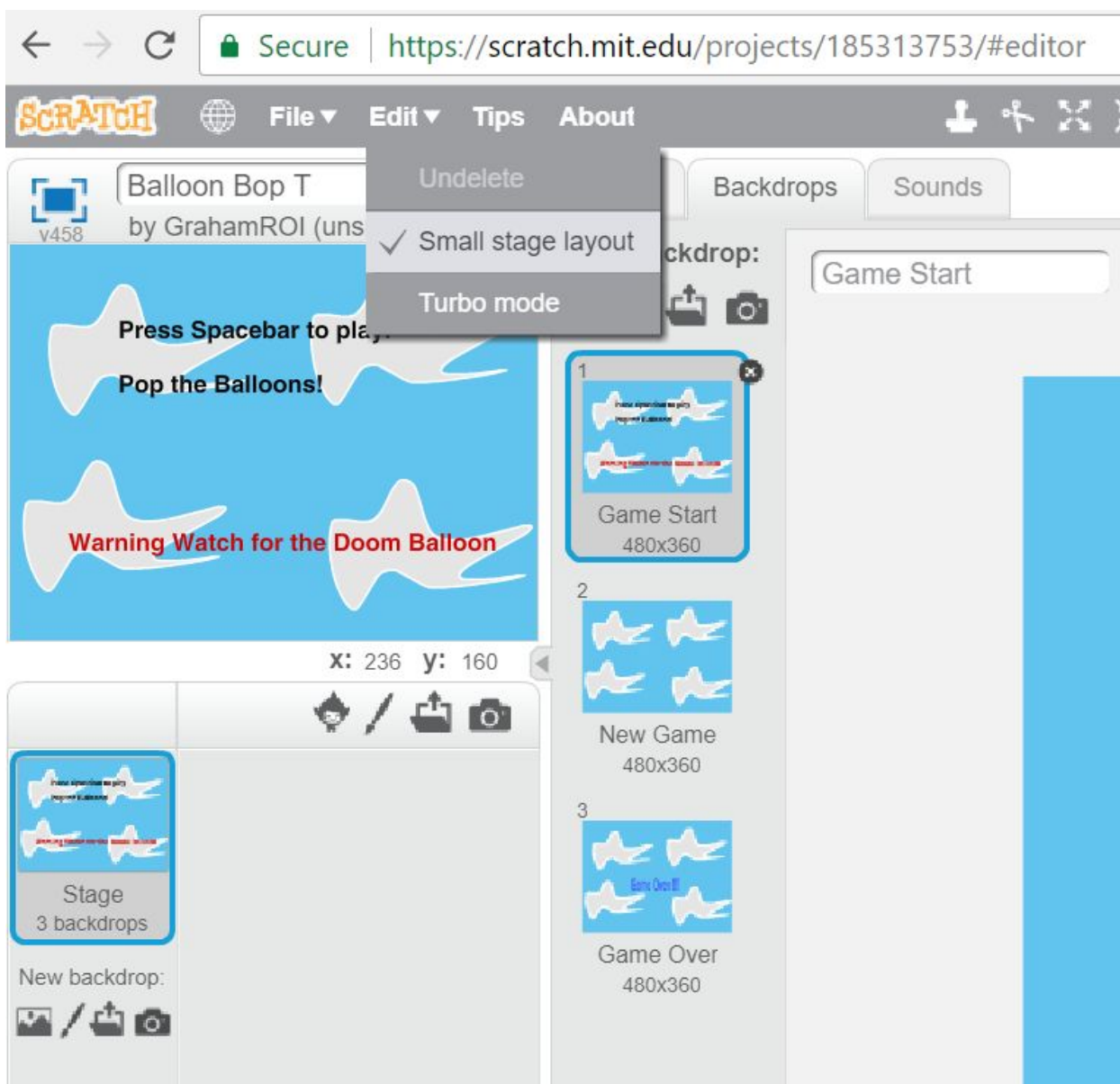

Figure (1) : Select Small Stage Layout to allow for increased editing screen space.

2.2 Vector Graphics Editor

Rename our backdrop to a meaningful name like: "Game Start" . Click on the option to select Vector Graphics, which allows for greater control when creating artwork. Discuss the difference between bitmap editor and vector graphics in a simple way .ie. the bitmap is a collection of coloured pixels (screen dots), where vector graphics allows the selection and editing of individual objects on the screen which can be layered.
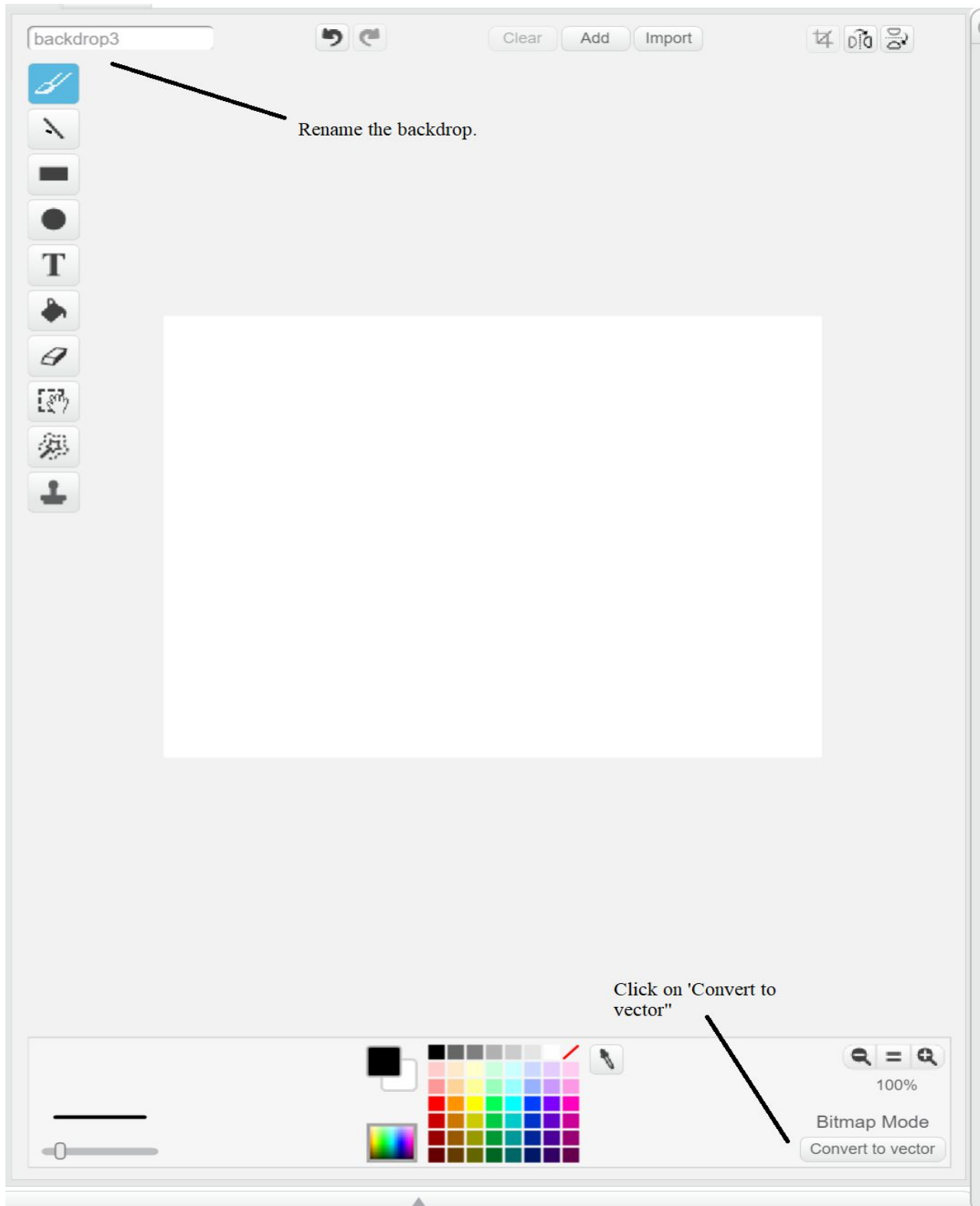

Figure (2): Rename backdrop to meaningful name and ensure we use Vector Graphics as our editor.

2.3 Key tools for Vector Graphics

The tools available: Select, Reshape, Pencil, Line, Rectangle, Ellipse, Text, Color a Shape (Paint Bucket) and Duplicate (Copy).
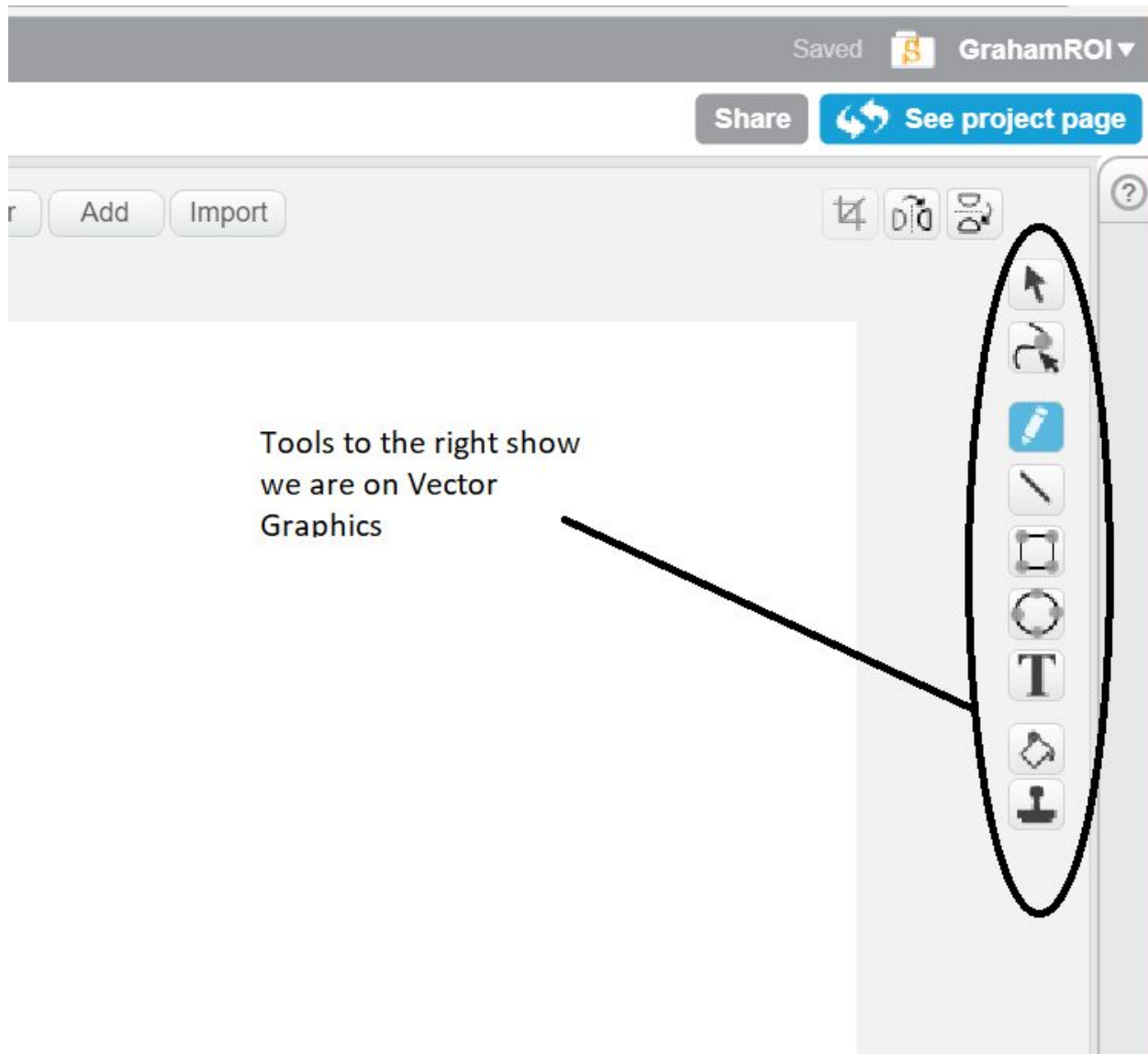

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Figure (3) : Tools available for Vector Graphics: Select, Reshape, Pencil, Line, Rectangle, Ellipse, Text, Colour a Shape (Paint Bucket), and Duplicate (copy function) .

2.4 Reshape Tool

When adding clouds to the background mention the Reshape tools which is a powerful tool to edit a basic shape as allows control points to pull or push and change the shape of our artwork, in the example shown, there are 8 small control points, shown as small white circles, to add more control points click on the edge or boundary of the object to add more.
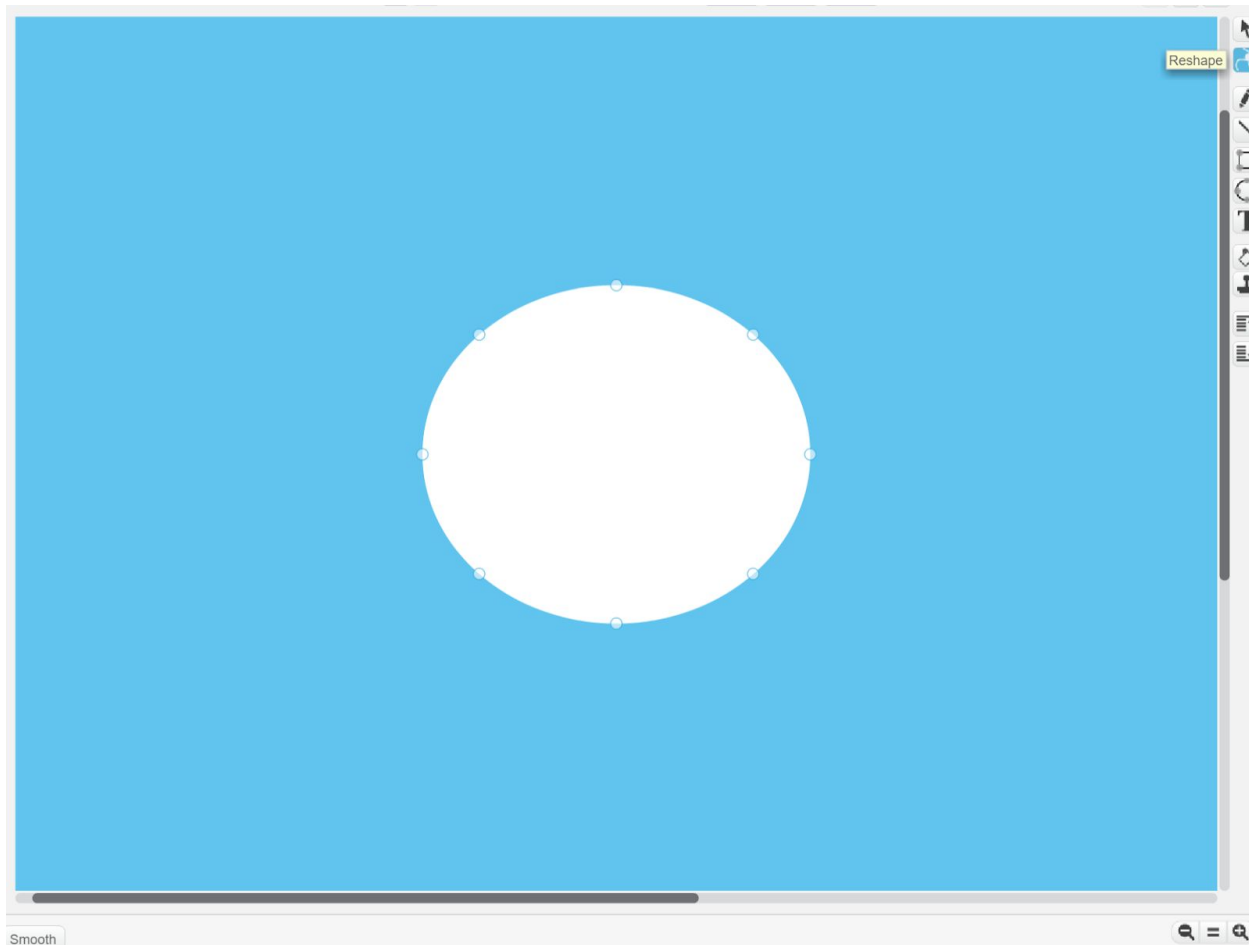

Figure (4) : Select an ellipse tool, then use the Reshape tool and notice that small white circles appear in the edge of the object, these can use to manipulate the shape of the circle.

3 Stage Artwork and background

Next you need to create three backdrops: Game Start, Game Play and Game Over.

Once you have these examples made you can change as you develop your own version of this game.

3.1 Game Start

Figure (5): Game Start Stage Backdrop
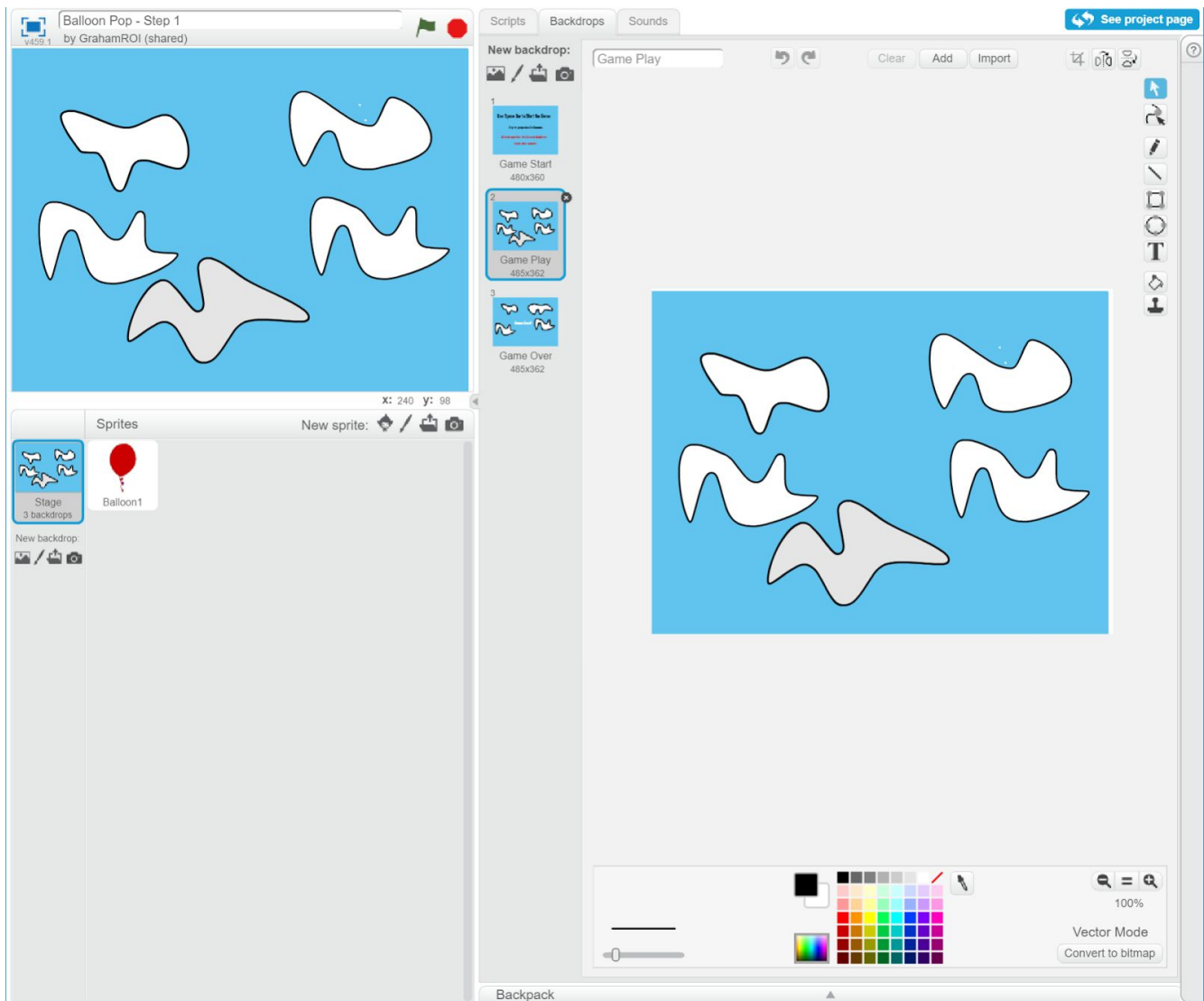
3.2 Game Play

Figure (6): Game Play Stage Backdrop
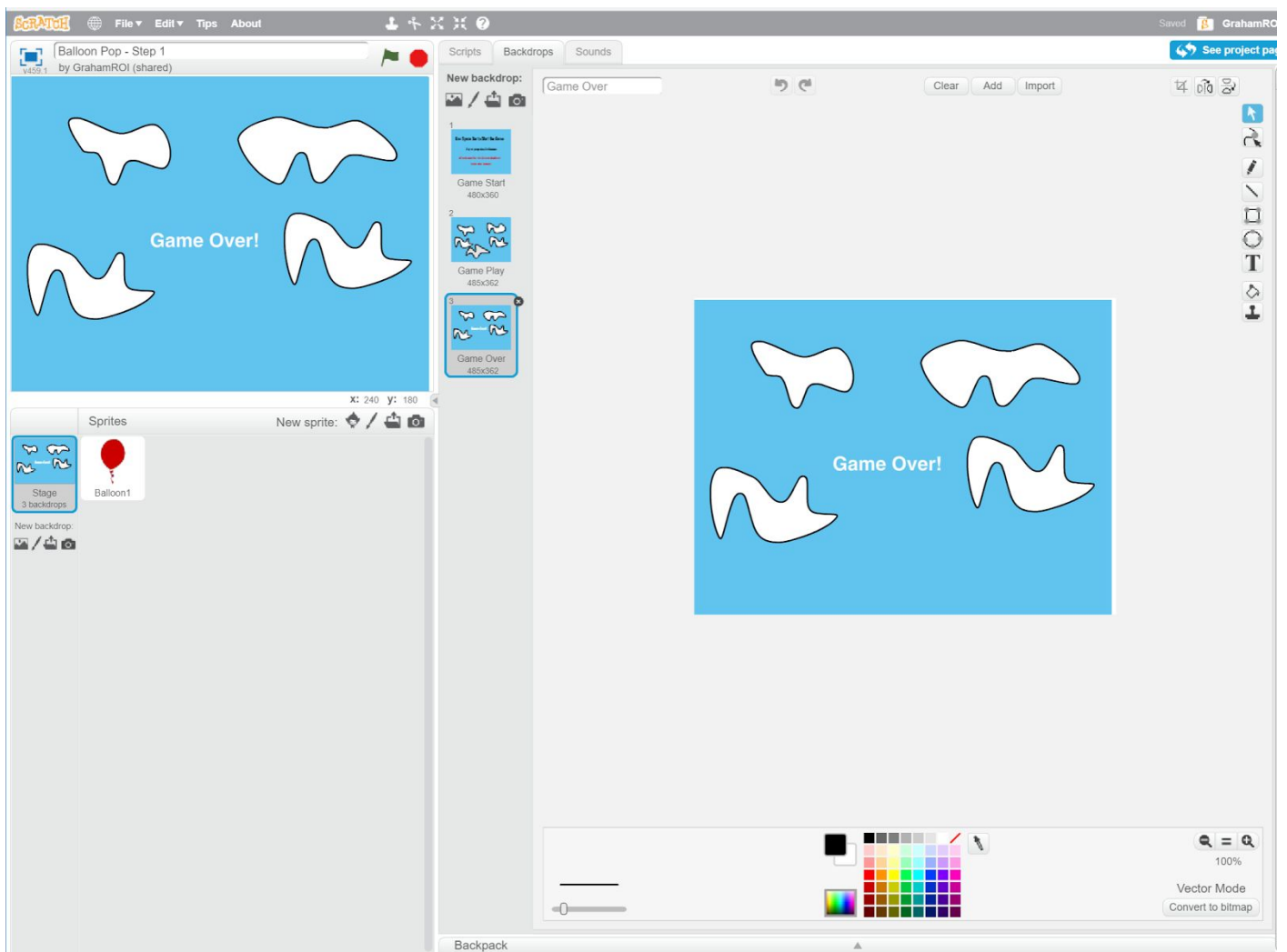
3.3 Game Over

Figure (7): Game Over Stage Backdrop

4 Code for the Stage

There are three states shown in this game are: 'Game Start', 'Game Play' and 'Game Over', where 'Game Play' is our Game Play state.

Issue a message Game Start with when 'Green Flag' Clicked. So all actions for the backdrop and for the Sprite when the message 'Game Start' is given. So the Backdrop must switch to 'Game Start' backdrop.

Figure (8): Code for the Stage.

By now you should have the code for Stage 1 … You can check your work against the online example: "Balloon pop - Step 1"

5 Code for the Balloon Pop

There are four events which can be used to control on the Balloon Sprite:

When 'Green Flag' Clicked
When I receive a 'Message' (Game Start, Game Play, Game Over)
When I Start as a Clone.
When this (cloned) Sprite is clicked.

5.1 When 'Green Flag' is Clicked

We have already dealt with "When 'Green Flag' is Clicked" in the code for the Stage and only need to respond to the message: 'Game Start'.

5.2 When I receive a 'Game Start' message

When the 'score' variable is introduced then have to set score to zero and hide the variable.

First we need to hide the Balloon Sprite.

Figure (9) When I receive a 'Game Start' Message

5.3 When I receive 'Game Play' Message

So when we have received 'Game Play' message we need to show the variable score on the 'New Game' screen and also we need to show the 'Game Play' Stage backdrop, which is shown on the code for the Stage.

Think about which is better to place the code on the Sprite vs Stage.

Do you think that if not associated with the sprite then should be placed on the Stage ?

Figure (11): When I receive 'Game Play'

What happens when we run this code?

How can we stop all the balloons appearing all at once ?

How can we make sure that the balloons use different colours?

Later we will add the: Pop'ed sprite and "Doom" Balloon costume.

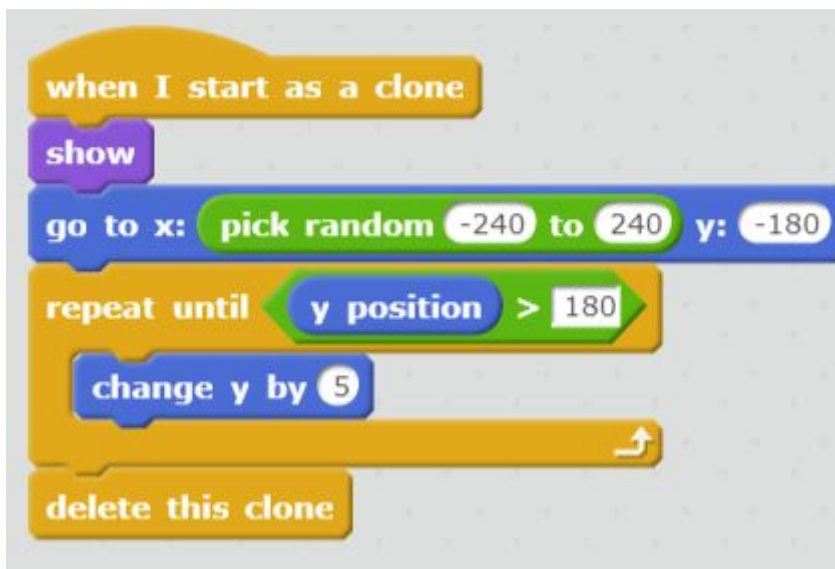## 5.4 When I start as a Clone

Figure (12): When I start as a Clone.

5.5 When this Sprite is clicked

This is the initial code for When this Sprite is clicked, this needs to be adjusted as the game play does not flow, with some balloons not being 'Pop'ed.
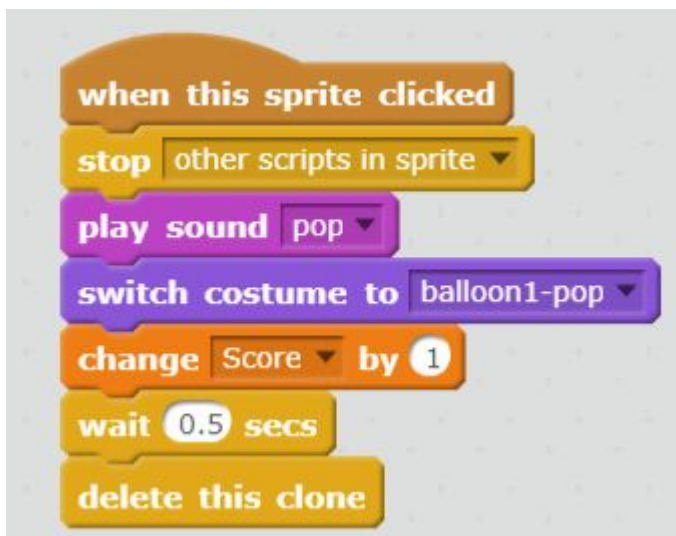

Figure (13): When this (cloned) Sprite is clicked

We also need to add in the code for the 'Doom' Balloon to end the game by broadcasting 'Game Over'