



# Hour of Code 2021 – Activity Guide

## Skiing

### Workshop Outline

Building a basic skiing game in Scratch where a sprite goes down-hill. The player must avoid obstacles to keep adding points, and if a collision occurs the player will lose points.

### Learning Objectives:

- Familiarity with the Scratch environment: sprite, stage and scripts
- Motion: Using the **keys** to control the main character movements
- Interaction: Sensing a specific sprite

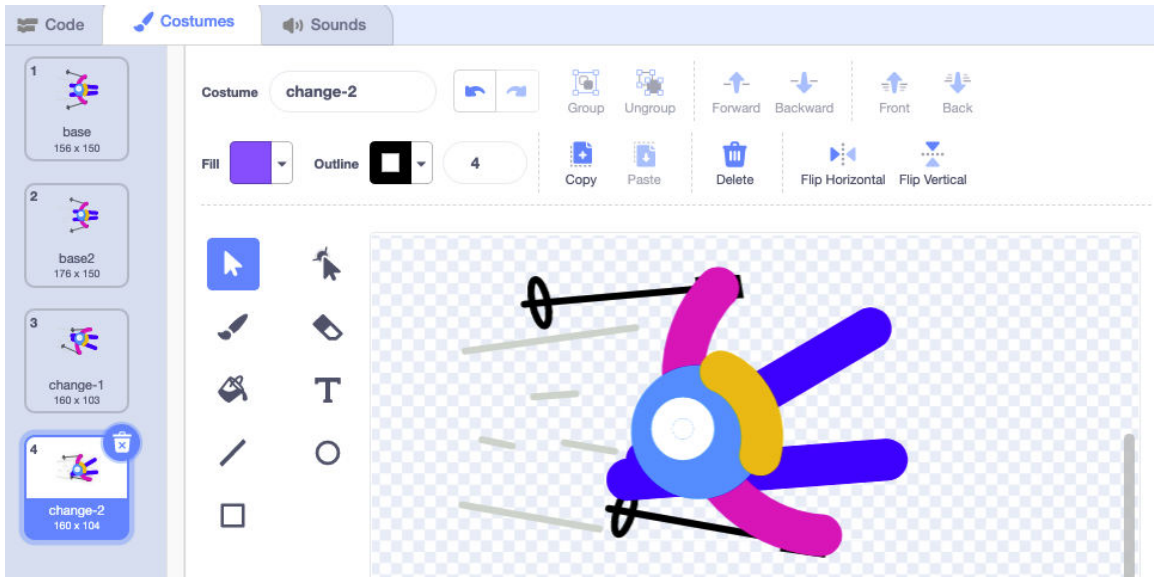
### Materials and resources:

- Scratch Account (Recommended)- Scratch info [link](#) - Account info [link](#)
- Scratch starter project OPTIONAL - [LINK](#)
- Scratch completed project - [LINK](#)

### Let's Code

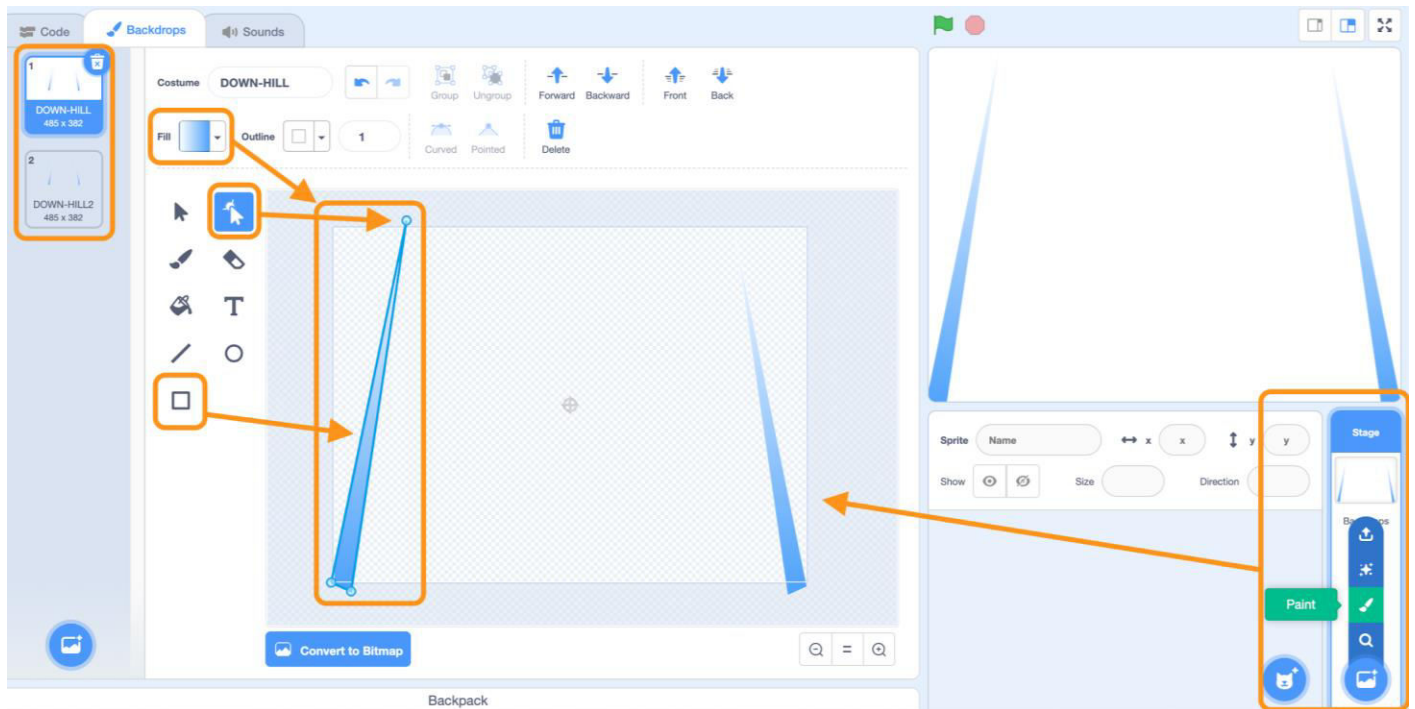
#### Customize your Skier

Change the provided skier Sprite in the starter code with colours and details that you like.



## Creating the Ski Backdrop

To create the ski backdrop we will create 2 squares which will be converted to triangles with the reshape tool. Once this is done we will add a gradient fading to white and duplicate its position with slight positional changes to add a speed effect to the main background.



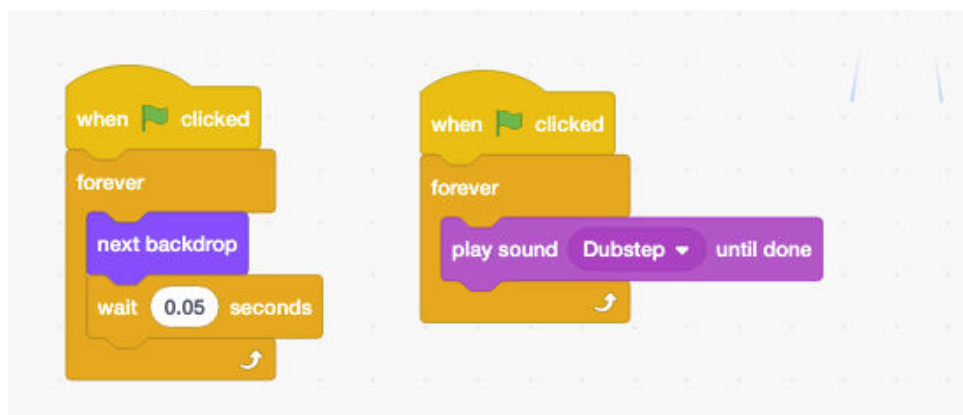
To create the backdrop, with the **Stage** selected go to the **Backdrops tab**:

1. Go to the **Square tool** and create a simple long rectangle, use the **Rotation tool** to tilt and create a sense of perspective.
2. Go to the **Reshape tool** and erase one of the vertices to create a long triangle.
3. Go to the **Fill section** and select a soft gradient from blue to white.
4. Select the triangle and, using the right mouse button **duplicate** the object and mirror it to the right.
5. Select the whole backdrop image from the left costumes panel and right mouse button **duplicate** it a second time.
6. Change slightly the position of the triangle tips to achieve a background speed effect when animating the backdrops really fast.

**Note:** Because the game has a lot of movement, the creation of the speed effect adds a huge amount of visual engagement to the game. Simple sprite duplicates and small positional changes create these increases in experience.

## Coding the Ski Backdrop

The Goal of the code is to display a constant speed effect by changing very fast between sprites and adding a constant sound to create an action atmosphere. Add the following blocks to your background code.



The blocks on the left change the background between the two designs, creating a sense of movement and the blocks on the right play a song to add atmosphere.

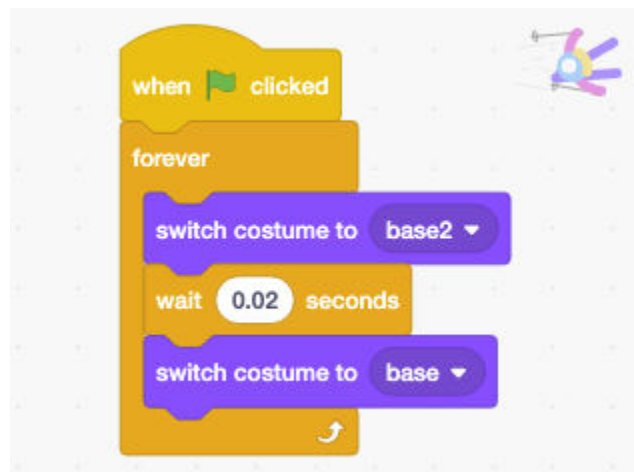
## Coding the Skier Sprite

The Skier will have multiple blocks of code, each one with a different purpose. First, we will set the initial position of the Sprite and secondly, we will add a speed effect by changing costumes as we did on the previous step.

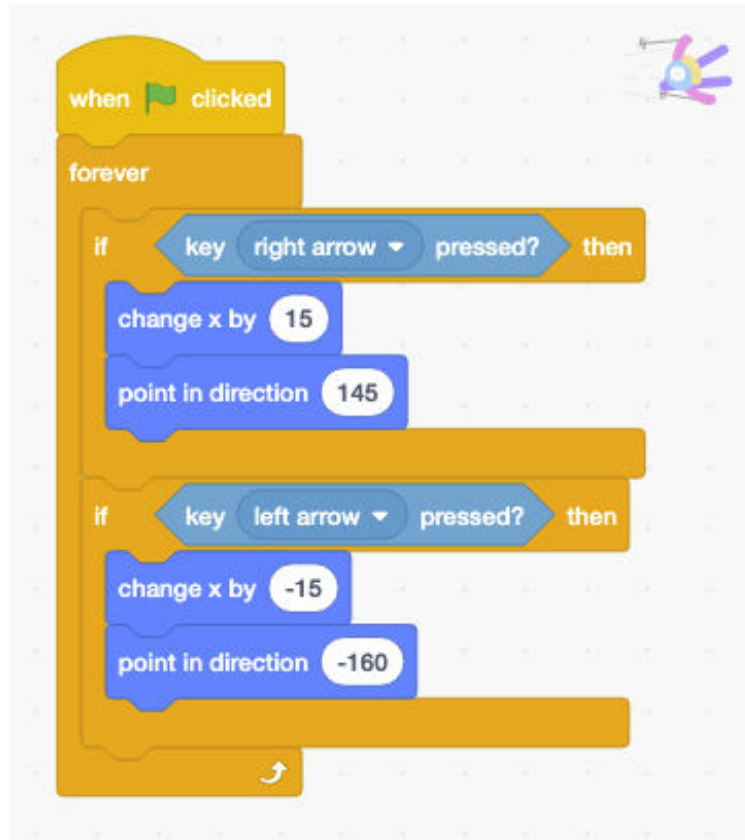
1. The following code sets the starting position for the skier Sprite to a random position on the top of the screen:



2. Add the illusion of speed by continuously changing the costume of the skier while the game is playing:



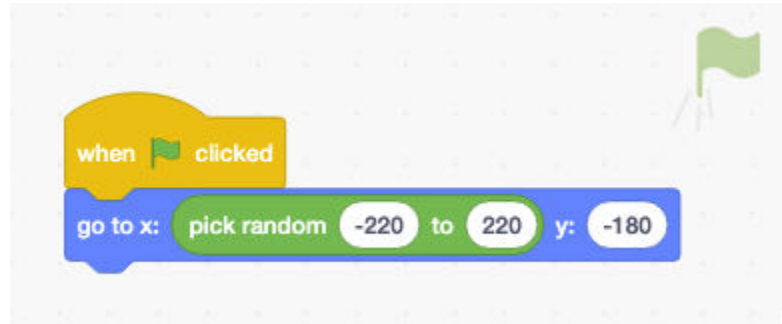
- Control the skier position with the arrow keys. The program will continuously (forever) listen for an arrow key being pressed and will react according to the instructions in the **if then** block:



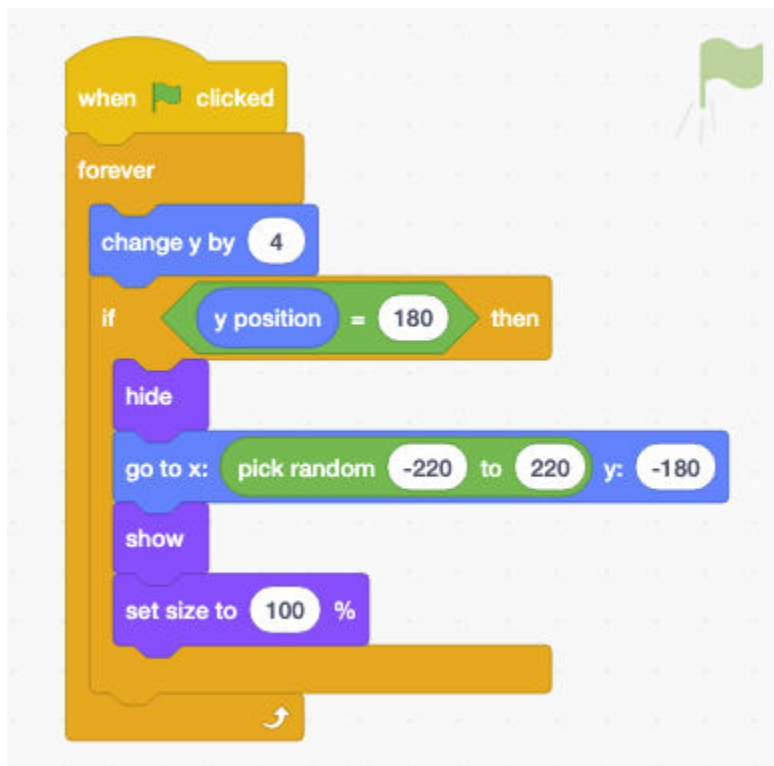
## Coding the Flag Sprite

We provided in the starter project a Flag Sprite with two costumes. You may customize it anyway you like. When you are done changing it, add the two sets of blocks shown below. The first one will control the initial position of the Sprite and the second one makes the Flag move down on the Stage, and when it reaches the bottom (y greater than 180) it makes it go back to the top and start again.

- Setting the initial position:



2. Move the Flag on the screen:



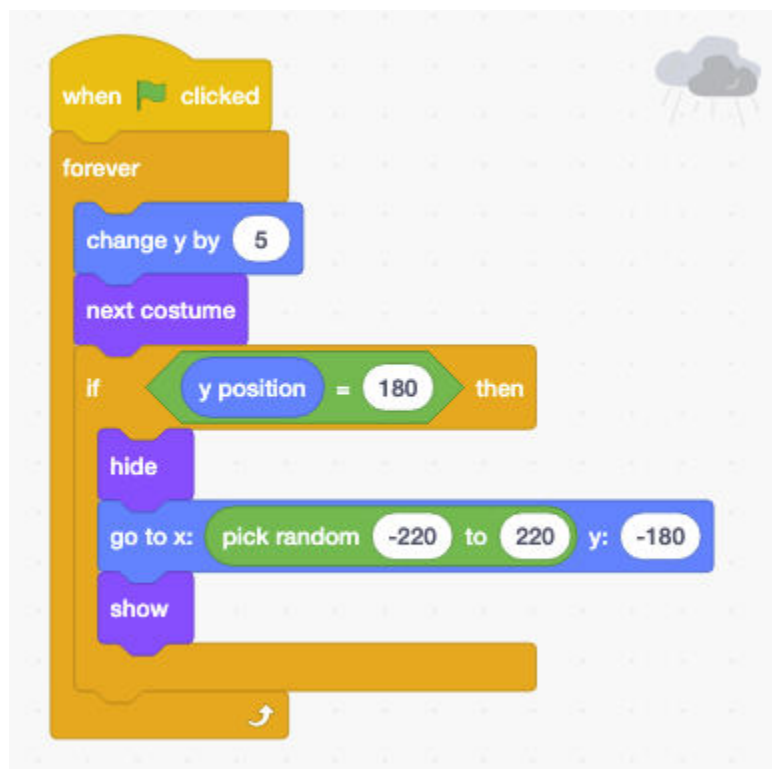
## Coding the Rock Sprite

We provided in the starter project a Rock Sprite with two costumes. You may customize it any way you like. When you are done changing it, add the two sets of blocks shown below. As you may see the blocks for the Rock Sprite are almost identical to the Flag Sprite, except for the speed. The Rock in this case moves faster.

1. Setting the initial position:



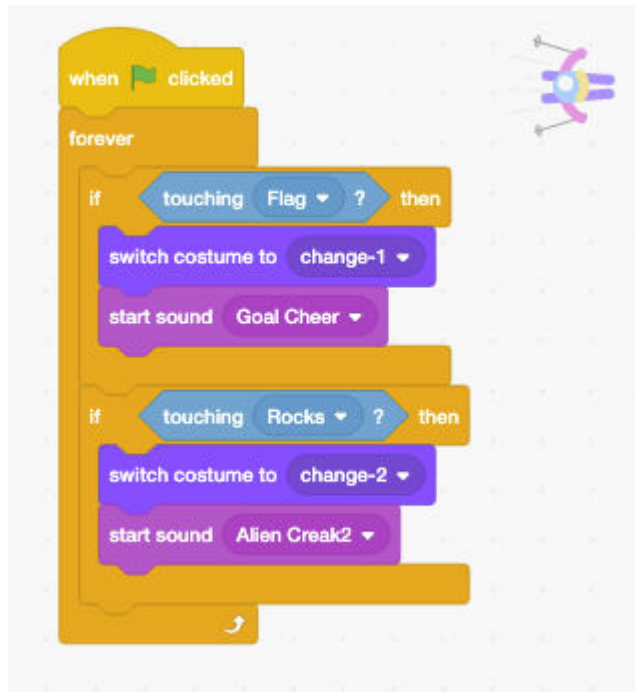
2. Move the Flag on the screen. The rock moves 5 steps each time:



## Detecting Skier Collisions with Rocks and Flags

In this part, you will add code that makes the game more exciting! The game needs to detect if the Skier is touching the Rocks or the Flag and react with a costume change and a sound.

The code will run for as long as the game is playing (forever) and will use the Sensing block to determine if any two Sprites are touching. Add the following blocks to your Skier Sprite:



## Keeping Score

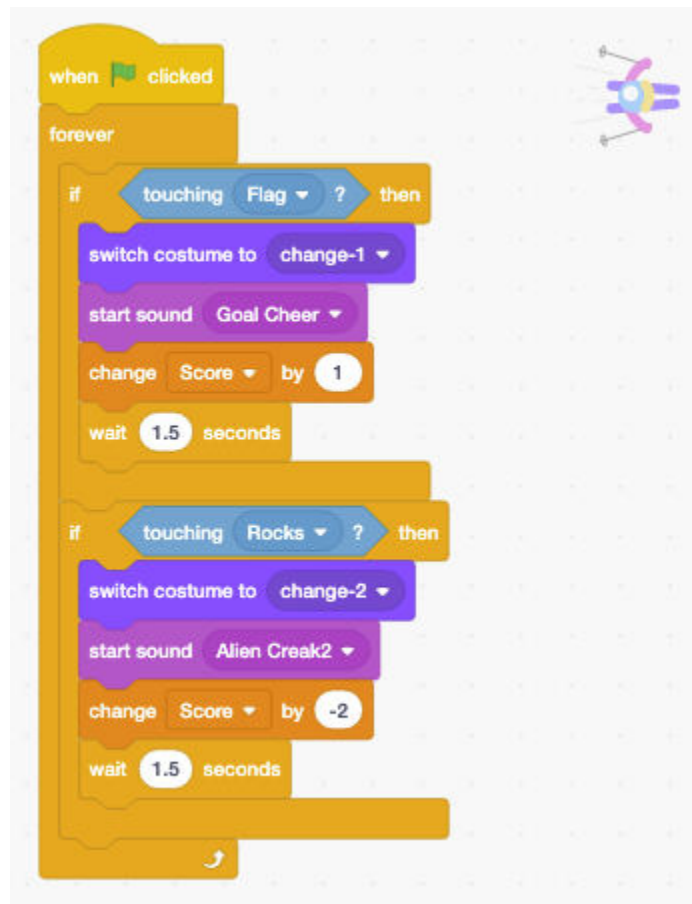
Adding a score involves two steps. First, there needs to be a place to store the numbers. Create a variable **Score** and add it to the start Skier code you created before. Set the value it contains to zero, as you can see on the image below.





The second step involves modifying the code that detects the Skier hitting Rocks or Flags and changing the number of points the player gets depending on what object was hit. If the object is a Flag, the player gets one (1) point, but if the object is a Rock, the player loses two (2) points.

In the example below you'll see that there is another new block, the **wait 1.5 seconds** block. The game needs this block to accurately keep score. Try the game with and without this block and see what happens.



Great work! You have created a Skiing game using Scratch. Try some of these extensions:

### Extensions

1. Add a timer that ends the game after 1 minute
2. Change the speed of the Rocks to make the game harder when the score increases
3. Add special bonus objects appearing on the screen for the skier to capture or avoid

