Shake, Code & Battle: micro:bit Rock Paper Scissors

Overview

In this engaging project, you'll learn how to program your micro:bit to play Rock Paper Scissors using a combination of buttons, gestures, and the LED display. We'll start by understanding the basic game logic and how to represent rock, paper, and scissors using different inputs. You'll discover how to use random selection for the computer's choice, display game outcomes using animations, and keep track of scores. Through this project, you'll develop fundamental coding concepts like variables, conditionals, and loops while creating something fun and interactive. By the end, you'll have a fully functional game that you can play with friends or challenge the computer – all powered by your micro:bit!

What you will Learn

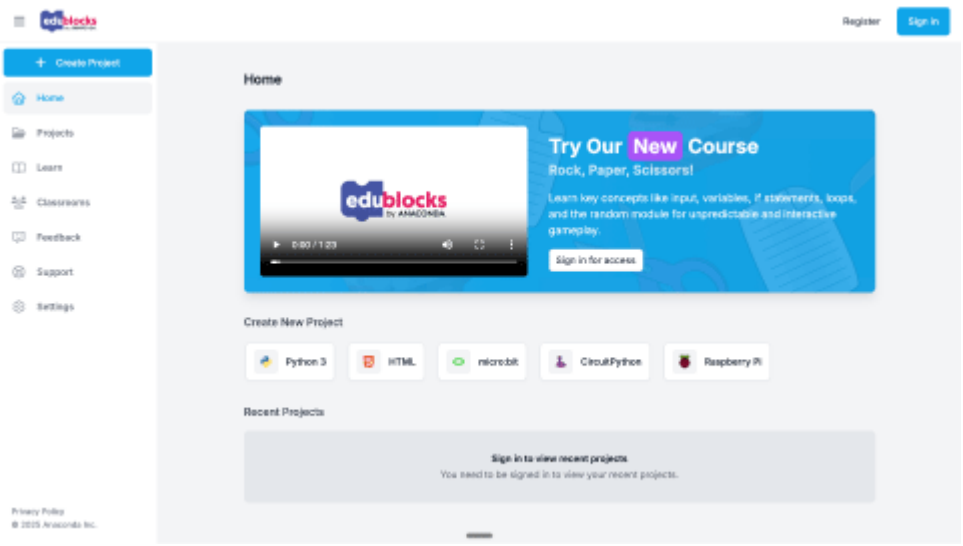
- [ ] How to create and use a Variable
- [ ] How to use the micro:bit accelerometer shake gesture
- [ ] How to display images/shapes on the LED matrix
- [ ] How to use conditional if/else statements
- [ ] How to use comparison operators
- [ ] How to randomise choices

What you will Need

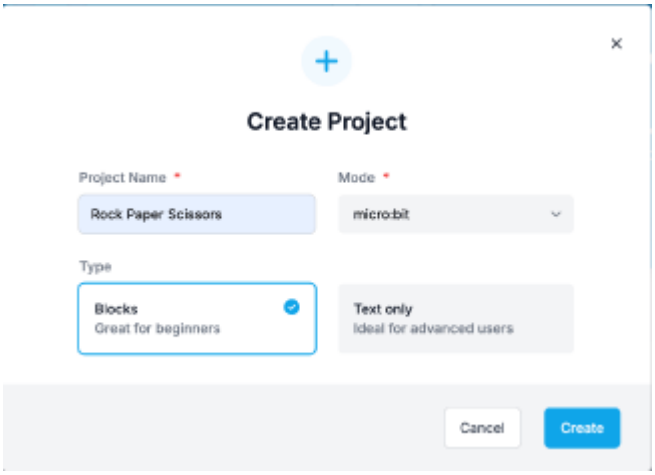
- 1 x micro:bit
- 1 x micro USB cable
- 1 x battery pack for the micro:bit (optional)

Navigating to EduBlocks

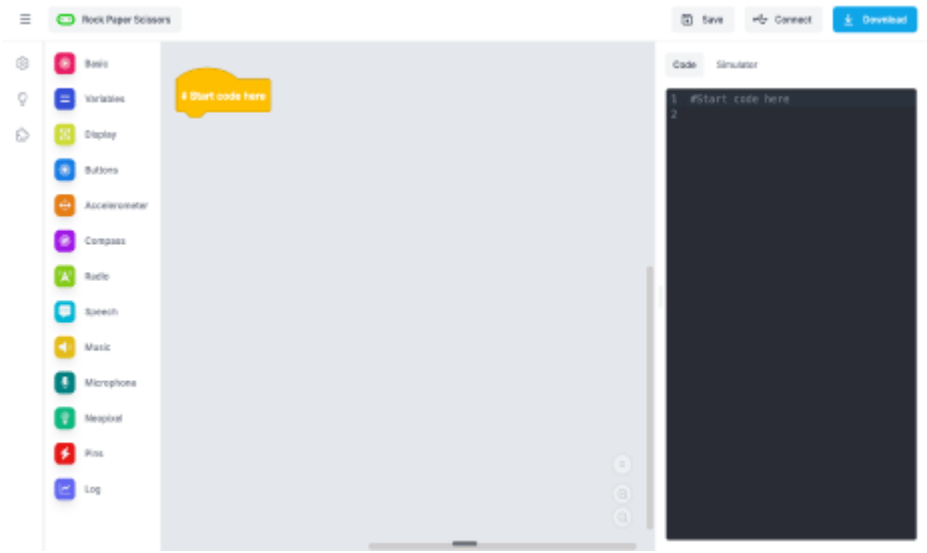
1. Open your favourite browser (we recommend Google Chrome).
2. Within the address bar of the browser type app.edublocks.org or on a tablet or phone press create code.



3. Select micro:bit under **Create New Project** to open the micro:bit coding editor. Name your project **Rock Paper Scissors** and make sure you have **Blocks** selected under **Type**. See the image below.



4. Select **Create** to open the micro:bit editor.



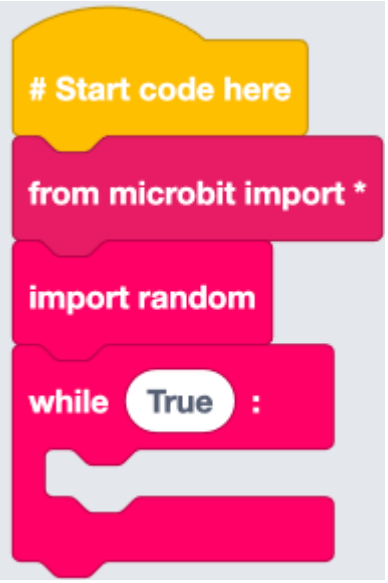
We are now ready to start coding!

Importing Python Libraries

1. Select Basic. Select and drag a `from microbit import *` block to the code area and drop it.
2. Select Basic. Select and drag an `import random` block to the code area and attach it under the `from microbit import *` block.

Creating the While Loop

1. Select Basic. Select and drag a `while True:` block to the code area and attach it under the `import random` block.

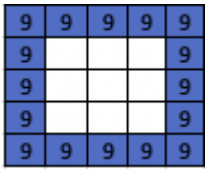


Creating the Rock Paper Scissor Variables

> WHAT IS A VARIABLE
> Think of a variable as a box that stores information that can be used throughout our program. We give variables a descriptive name so we and others can understand what is going on within our program.

Creating Paper

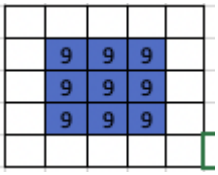
1. Select Display. Select and drag an `image =` block to the code area and attach it within the `while True:` block.
2. Drag another two `image =` blocks to the code area attaching them under the first `image =` block.
3. Within the first `image =` block create the following image to represent Paper by typing **9** (this represents the brightness of the LEDs) in the corresponding squares.



4. Select the drop-down arrow next to **image** and select **New variable** and name it **Paper**.

Creating Rock

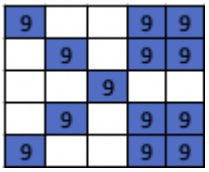
1. Create the following image to represent Rock by typing **9** within the corresponding squares. in the next `image =` block.



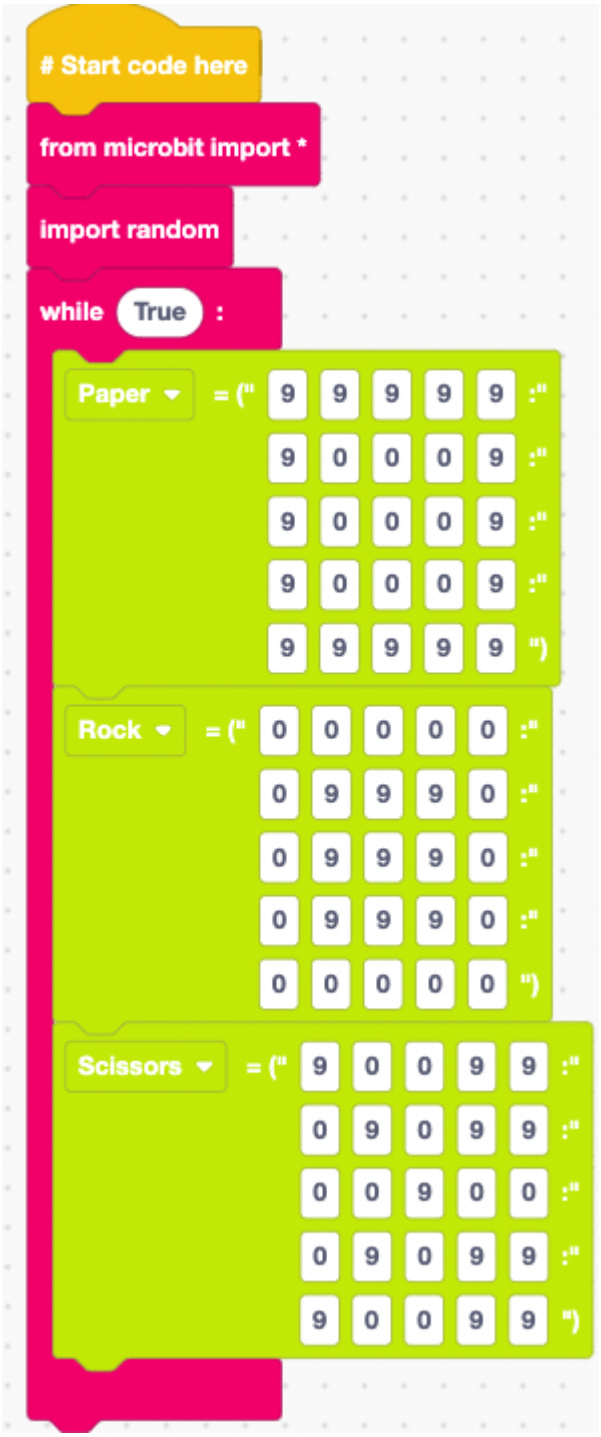
2. Select the arrow next to image and Select **New variable** and name it **Rock**.

Creating Scissors

1. Create the following image to represent Scissors by typing **9** within the corresponding boxes in the remaining `image =` block.



2. Select the arrow next to **image** and select **New variable** and name it **Scissors**.

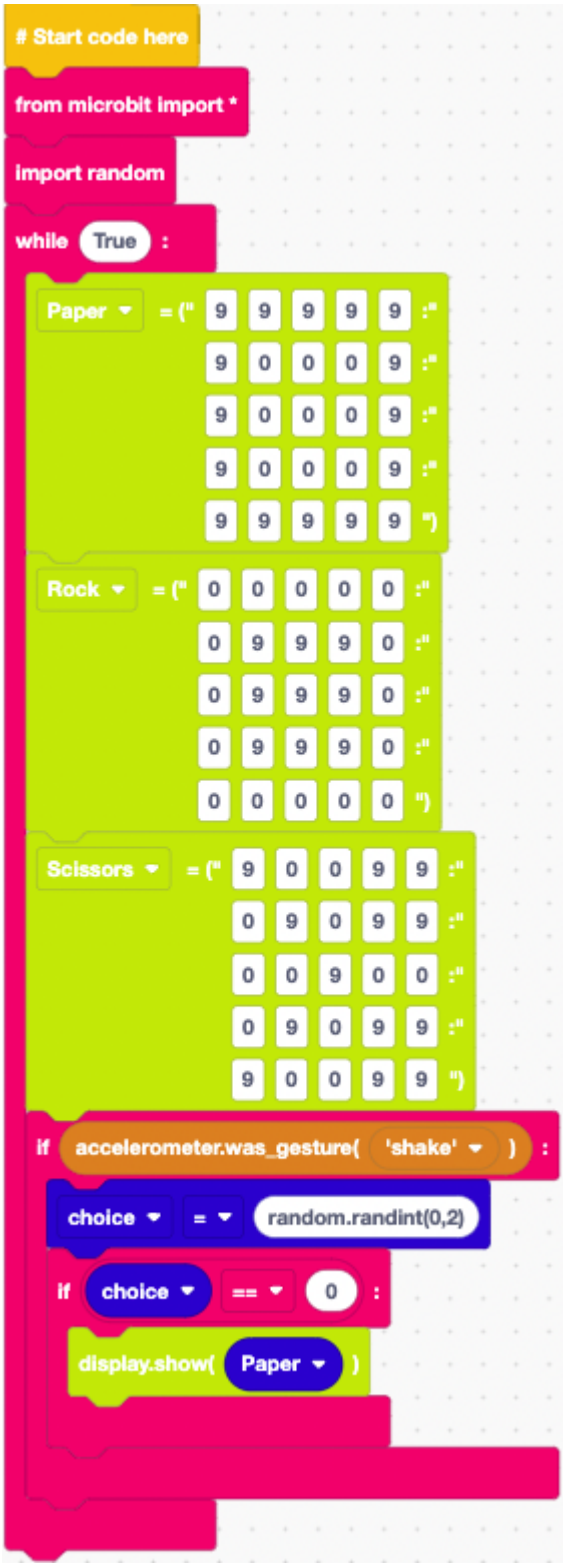


Creating the on shake Action

1. Select Basic. Select and drag an `if True:` block to the code area and attach it under **Scissors**.
2. Select Accelerometer. Select and drag an `accelerometer.was_gesture('shake')` block to the code area and attach it within the **True** of the `if` block.
3. Select Variables. Select create variable and name it **choice**. Select OK or press **Enter** on the keyboard.
4. Select Variables. Select and drag a `choice =` block to the code area and attach it within the `if accelerometer.was_gesture('shake')` block. Within the blank space type **random.randint(0,2)**.

Creating the Choice = 0 Condition

1. Select Basic. Select and drag an `if True:` block to the code area and attach it below the `choice = random.randint(0,2)` block.
2. Select Basic. Select and drag a `0 == 0` block to the code area and attach it within the **True** of the `if` block.
3. Select Variables. Select and drag a `choice` block to the code area and attach it within the first **0** of the `if`block.
4. Select Display. Select and drag a `display.show(Image.HAPPY)` block to the code area and attach it within the `if choice == 0:` block.
5. Select Variables. Select and drag the `Paper` block to the code area and attach it within **Image.HAPPY**.

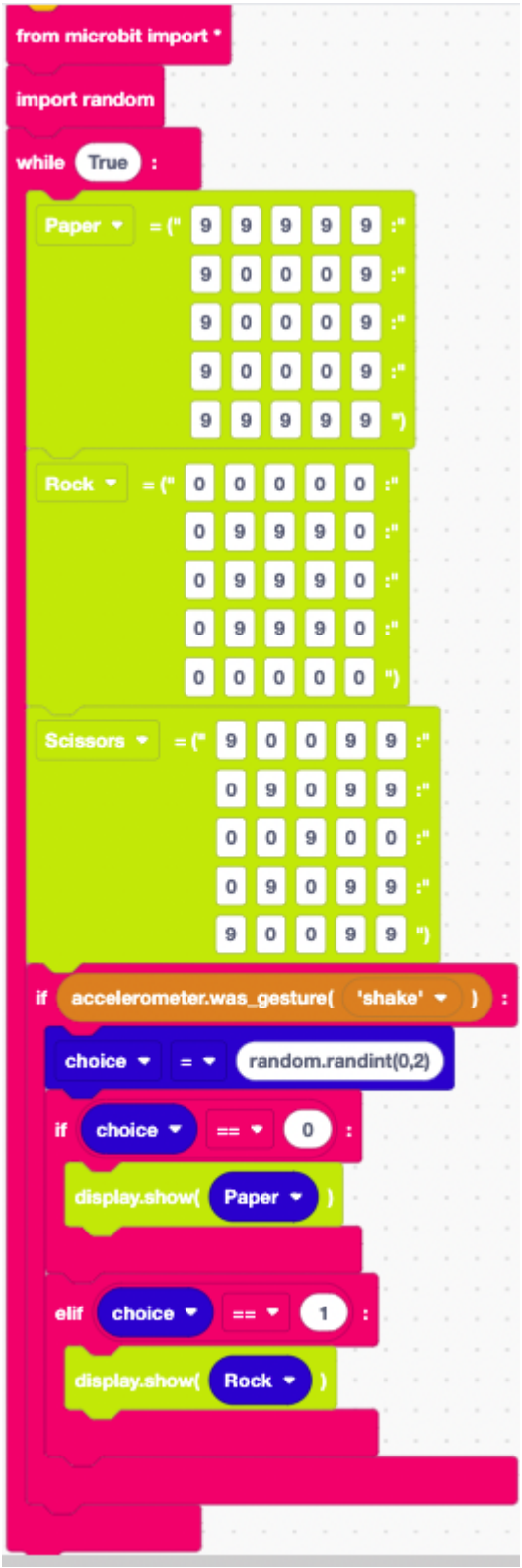


Creating the Choice = 1 Condition

1. Select Basic. Select and drag an `elif` block to the code area and attach it below the `if choice == 0:` block.

2. Right-click on `choice == 0` and select **duplicate**. Attach the duplicated block within the **True** of the `elif` block. select **0** and type **1**.

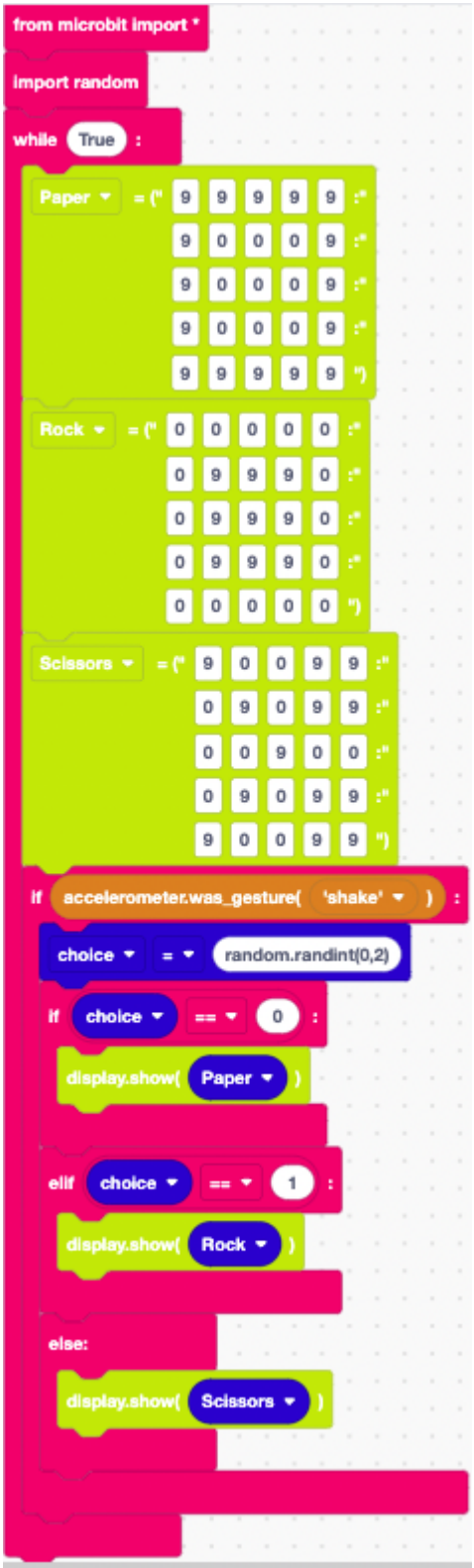
3. Right-click on the `display.show(Paper)` block and select **duplicate**. Attach the duplicated block within the `elif choice == 1:` block. Select **Paper** and choose **Rock**.



Creating the Choice = 2 Condition

1. Select Basic. Select and drag an `else:` block to the code area and attach it under the `elif choice == 1:` block.
2. Right-click on `display.show(Rock)` and select **duplicate**. Attach the duplicated block within the `else:` block. Select **Rock** and choose **Scissors**.

Completed Code:



We have now finished coding rock paper scissors the next step is to download our code to the micro:bit.

Downloading the code to the micro:bit

1. Take the micro USB cable and connect the micro:bit to the computer.
2. Select **Connect** and follow the pop-ups on screen to pair the micro:bit to the web browser.
3. Select the **Download** button to download your code to the micro:bit.

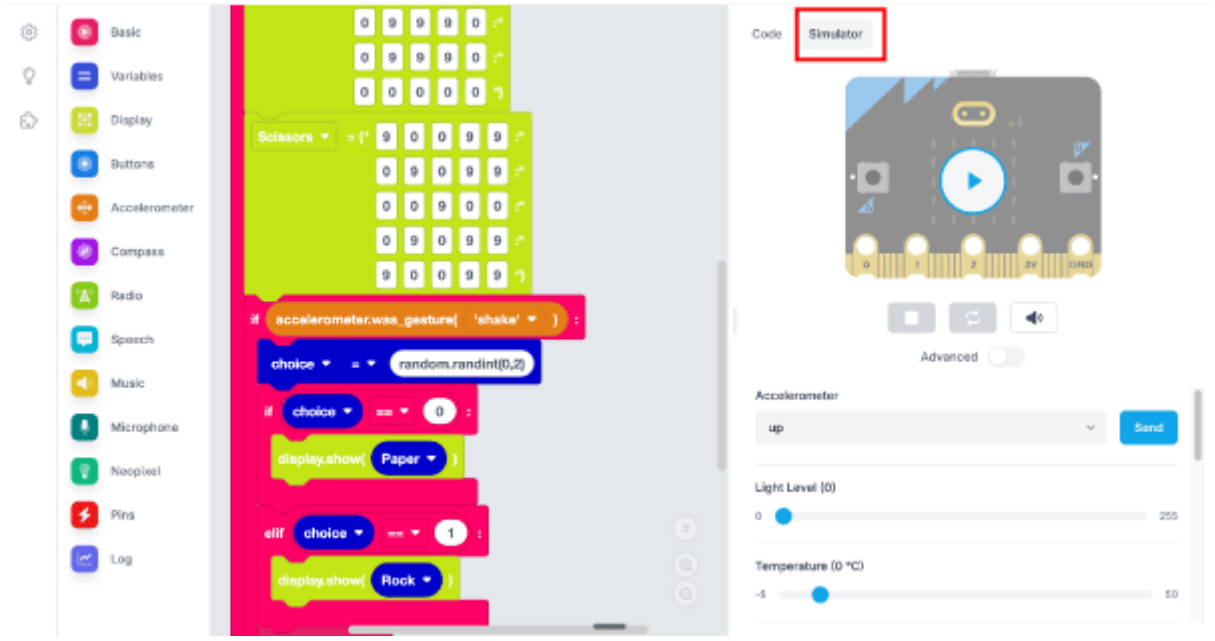
Well done you have created your very own Rock Paper Scissors game for the micro:bit.

How to Play

Web Browser

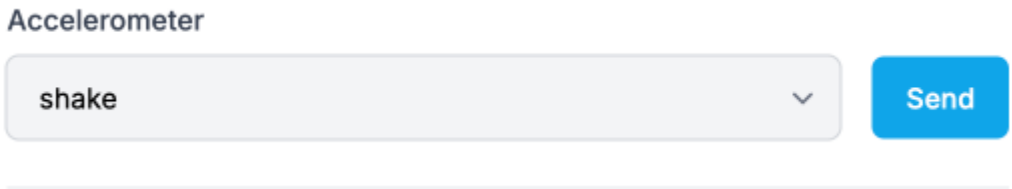
The EduBlocks Editor has a built-in micro:bit simulator so you can use this if you don't have a micro:bit handy.

1. On the right-hand side of your screen select **simulator**.



2. From the **Accelerometer** menu below the simulator select **shake**.

3. Select **send** this will now simulate a shake of the micro:bit and display either rock, paper or scissors on the micro:bit simulator.



Using the micro:bit

Once you have downloaded the code to your micro:bit you can shake the micro:bit and see a rock, paper or scissors image appear on it.

Find a partner and start playing or play against yourself.