Introduction

You are going to make a game in which players have to guide a wand along a course without making contact. Making contact will add one to the player's score - the player with the lowest score wins!

For this project you'll need some additional items:

- Metal wire (approx. 50cm);
- Modelling clay (Plasticine or similar, needs to be non-conductive);
- Electrical tape (optional);
- Crocodile clip leads (optional).
Step 1: Storing fails

Let's start by creating a place to store the number of fails.

✔️ Activity Checklist

☐ Go to rpf.io/microbit-new to start a new project in the MakeCode (PXT) editor. Call your new project 'Frustration'.

☐ Delete the **forever** and **start** blocks by dragging them to the palette:

☐ A new game should start when the player presses button A. Click 'Input' and then **on button A pressed**.

☐ Now you need a variable to store the number of times you fail in the game by touching the wire with the wand. Click on 'Variables' and then 'Make a new Variable'. Name the variable **fails**.
Drag a `set` block from 'Variables' and select `fails`:

```
on button A pressed
set fails to 0
```

This will set the number of fails to zero when you press the A button.

Finally, you can display the number of `fails` on your micro:bit. To do this, first drag a `show number` block from 'Basic' to the end of your script.

```
show number 0
```

Then drag `fails` from 'Variables' into your `set` block:

```
set fails to 0
```

Click 'run' to test your script. Clicking button A should display the number of fails, which has been set to 0.
Challenge: Display an image

Can you display an image for 1 second (1000ms) before the number of fails are displayed?

You'll need to use the following blocks from Basic do to this:

Step 2: Keeping track of fails

Let's add code to keep track of fails.

✔️ Activity Checklist

☐ You're going to add 1 to your fails variable every time a connection is made on Pin0. To do this, drag on pin P0 pressed from 'Input'.
Next, add 2 blocks to display a cross for 1 second when Pin0 is pressed.

You'll then need to add 1 to your `fails` variable. To do this, click the drag a `change item by 1` from Variables and change `item` to `fail`.

Finally, you can add code to display the updated number of fails. Here's how your code should look.
Test your code by pressing button A on the emulator to start your game. Each time you press Pin0 you should see your `fails` variable increase by 1.

Click 'Download' and transfer your script onto your micro:bit. You can press Pin0 by completing a circuit. To do this, place your right thumb on the ground pin (GND) and then tap Pin0 with your left thumb.
Step 3: Building your game

Now that you've coded your game, let's put it all together!

✔️ Activity Checklist

☐ First, let's make your wand. Take a piece of wire about 20cm long and bend it in half, making a loop at the top.
You can then twist the two pieces of wire together.

To make the course, take another piece of wire about 30cm long and bend the middle part of the wire into shape. You should bend up one end of the course.

If you have some electrical tape, wrap some around the two ends of the wire, leaving some exposed metal at both ends.
Slide your wand through your course, and push the ends of your wire into some putty to stand it up.

You can now connect your game to your micro:bit using a crocodile clip lead or some wire. Firstly, connect the ground pin (GND) to one end of your course.

You can then connect Pin 0 to your wand.
Test your game. Press button A and your score should be set to 0. Each time your wand touches the course, the circuit is completed and your micro:bit should add 1 to your number of fails.

**Challenge: Cheat mode!**

Can you add a cheat to your game, so that pressing button B reduces your score by 1?

**Challenge: Personalise your game**

Get some friends to try out your game. If your game is too easy, you can make it harder by:
+ Creating a longer course;
+ Adding more bends to your course;
+ Making a wand with a smaller gap.