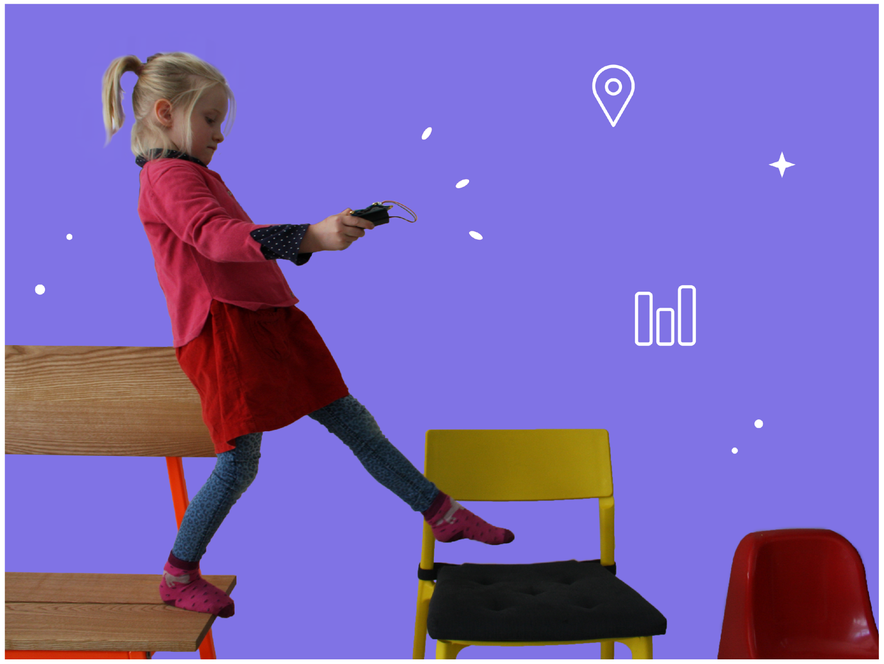
OBSTACLE COURSE

Set up an obstacle course in your home for you and your family and carry your Calliope mini through the obstacles. You have to keep the Calliope mini as straight as possible, otherwise the Calliope mini will give a warning signal and you will have to start all over again.
Who in your family is the most skilled?



CALLIOPE.CC

OBSTACLE COURSE

You need the following categories and blocks:

Action

Sensors

Control

Logic

Math

Play note
Plays the specified note.

Turn LED on
Turns on the RGB LED and changes to the specified color.

Show image
Displays an image on the LED display.

Acceleration sensor
Outputs the value for the acceleration.

Infinite Loop
Repeats the action indefinitely.

OBSTACLE COURSE

You need the following categories and blocks:

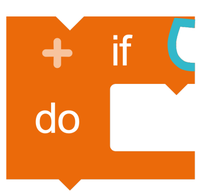
Action

Sensors

Control

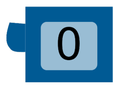
Logic

Math



If/do condition
If a condition is true, then execute specific commands.

Logic comparison
Returns true if both inputs are equal.



Value
The input value is a number.

OBSTACLE COURSE

1 Choose the block repeat indefinitely from the control category.

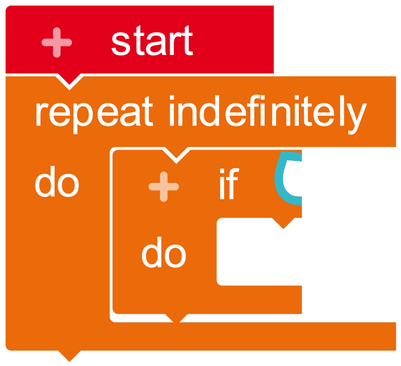
Control

OBSTACLE COURSE

2

The position sensor of the Calliope mini is designed to continuously read the acceleration values and thus determine whether you are holding it in a horizontal position (i.e. still) or not. Imagine that you have to carry a full plate of soup and you must not spill anything. First of all, use an if/do condition for this.

Control

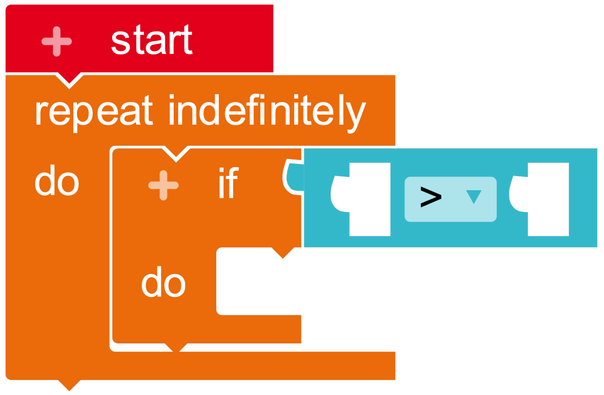


OBSTACLE COURSE

3

The comparison block > from the logic category allows you to define the if/do condition and specify when the Calliope mini should give an alarm.

Logic

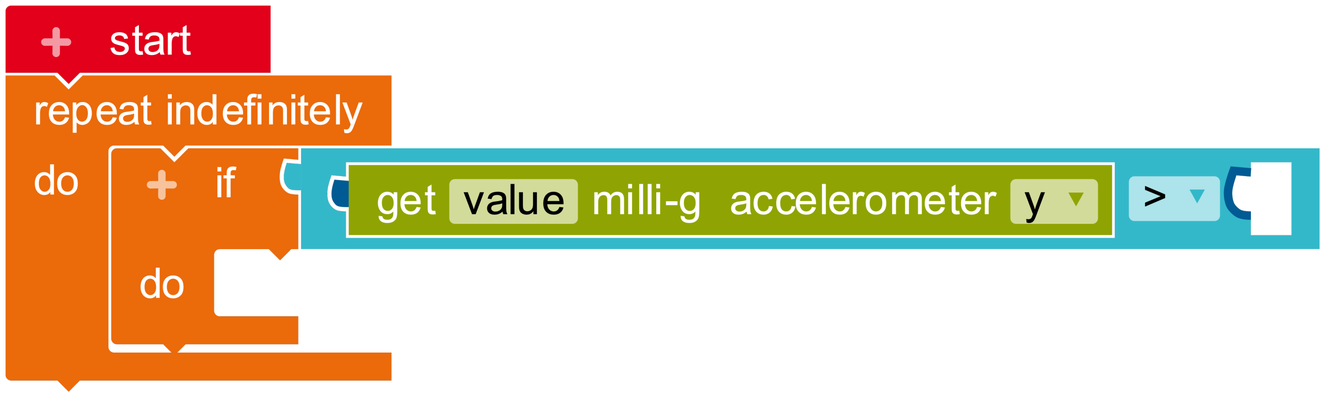


OBSTACLE COURSE

4

You will find the block get value of the accelerometer in the sensors category. The Calliope mini measures the strength of the acceleration in milli-earth gravity and displays this value as a number. You can also set the direction of the acceleration. Select the y-axis here. Drag the block to the first position of the comparison block.

Sensors



OBSTACLE COURSE

5

To set the alarm correctly, the next step is to define a so-called threshold value. This value indicates how much you can move the Calliope mini without triggering the alarm. This value must be placed in the second place on the comparison block. The smaller the value, the more difficult the exercise. Try the value "200".

Math

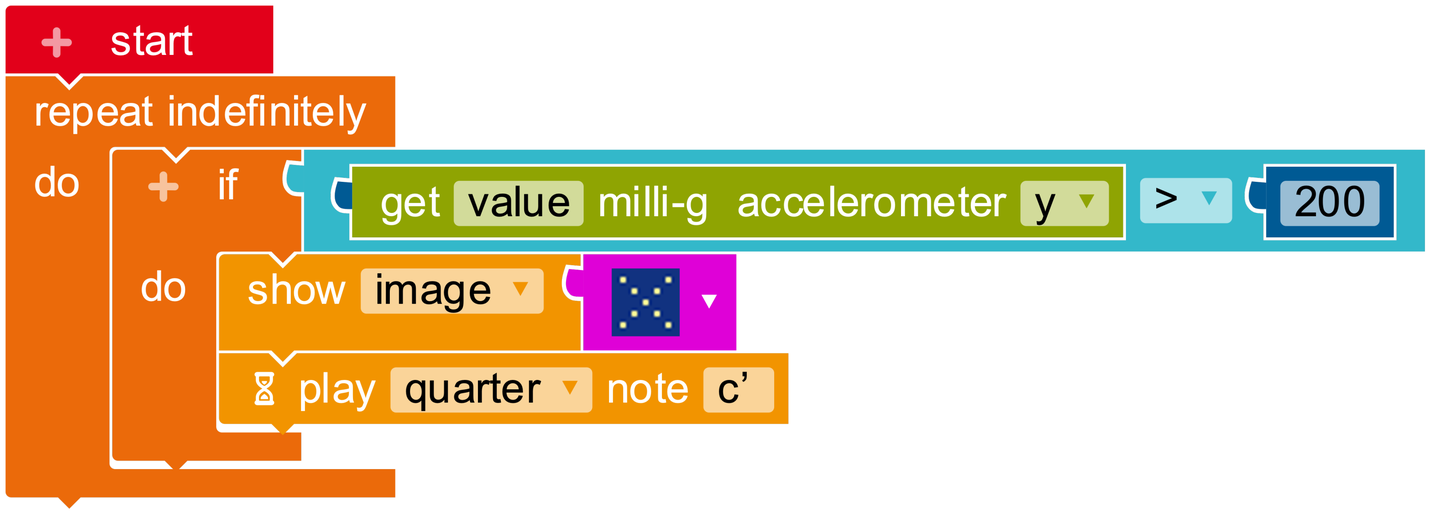
Tip: When the Calliope mini is lying flat on the table, the value for acceleration (mg) is approximately "0". If the Calliope is tilted backwards, the values become negative, if the Calliope mini is tilted forward, the values become positive. If the alarm goes off too quickly, you must increase the threshold.

OBSTACLE COURSE

6

In the next step the alarm signal is programmed. If the acceleration exceeds the threshold value, an "X" should appear on the LED display and a sound shall be played. Use the blocks show image and play note.

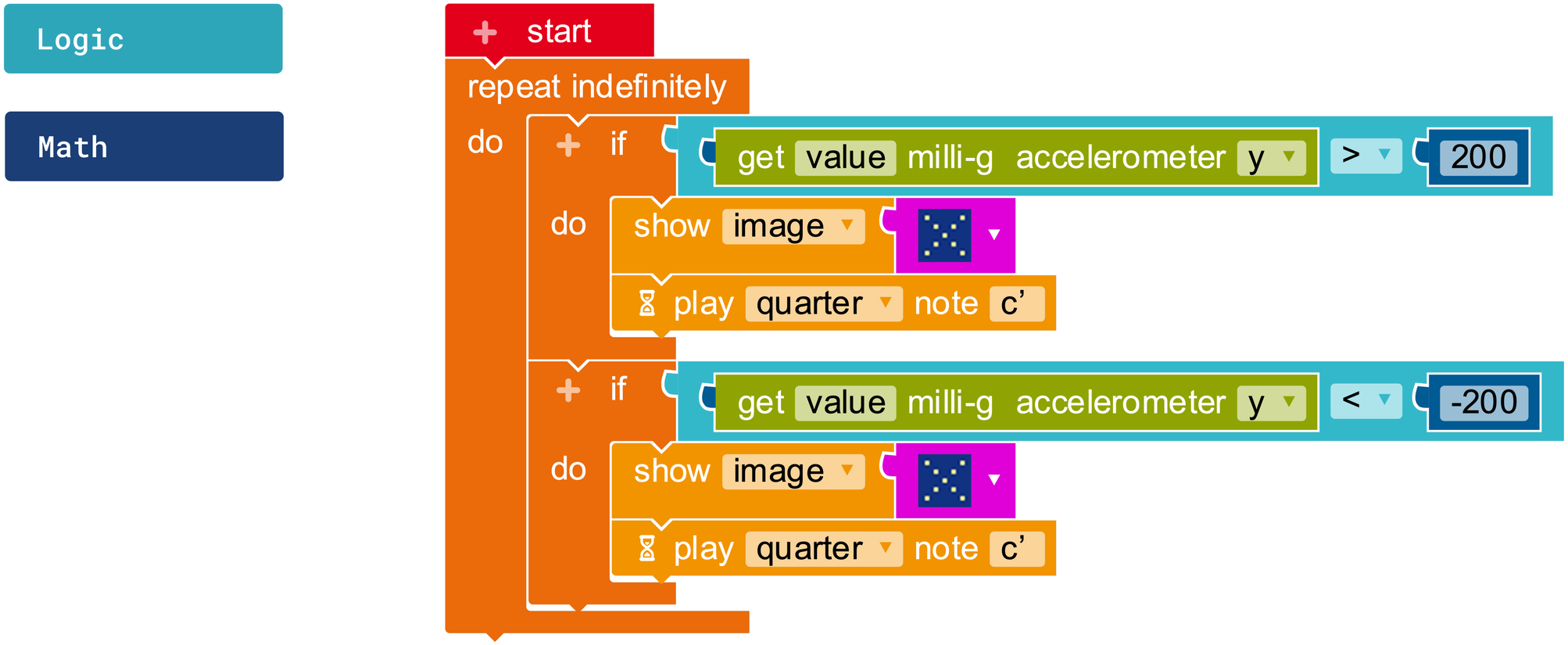
Action



OBSTACLE COURSE

7

Since the accelerometer also outputs negative values, we must also take these into account in our program. To do this, copy the entire if/do condition (right-click and copy) and paste it below the first condition. Now you only have to set the threshold to "-200" and change the direction in the comparison block to less than <.

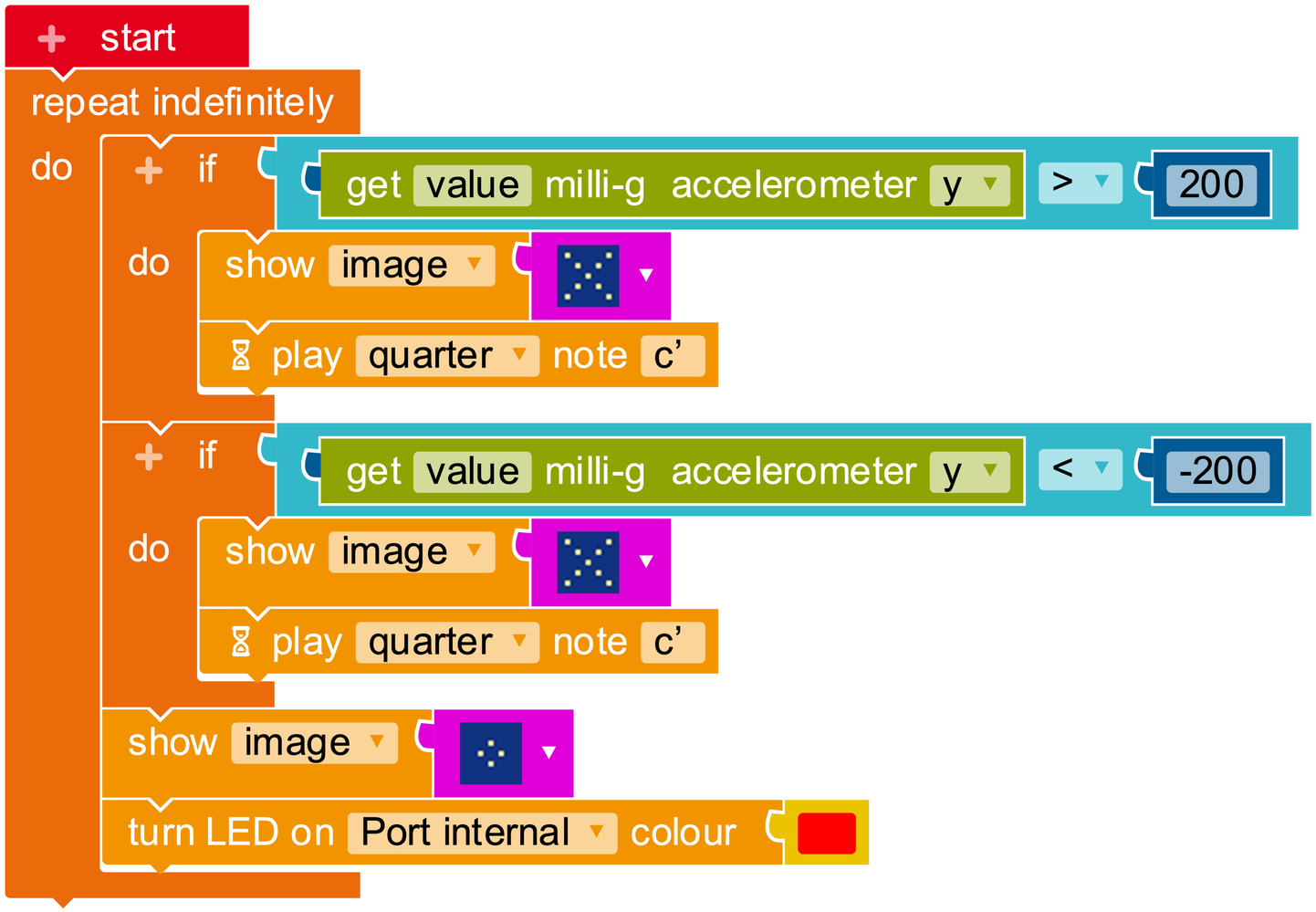


OBSTACLE COURSE

8

To make sure the Calliope mini shows something during the obstacle course, we use another show image block and switch the LED to red. Insert both blocks into the infinite loop.

Action



OBSTACLE COURSE

9

Upgrade: Up until now, the program has only considered the position in one direction (y-axis). Can you extend the program so that the acceleration is also measured on the x-axis? Try it out.

If you want to know what this upgrade can look like, download the .xml file from the Calliope website. You can then open and view it in the Open Roberta Lab.