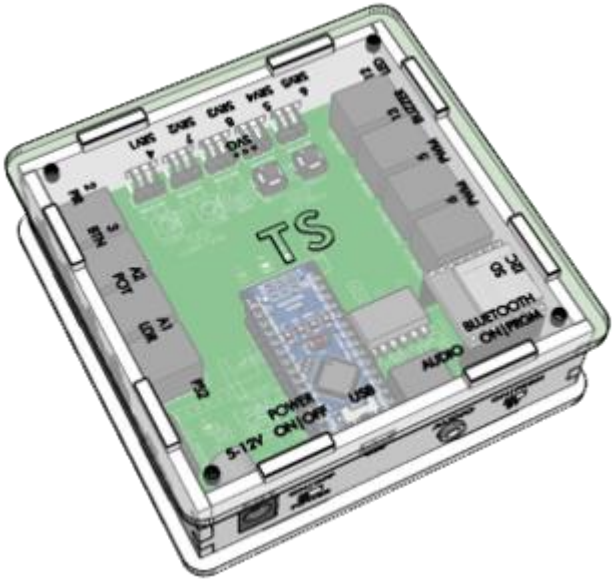


mBlock

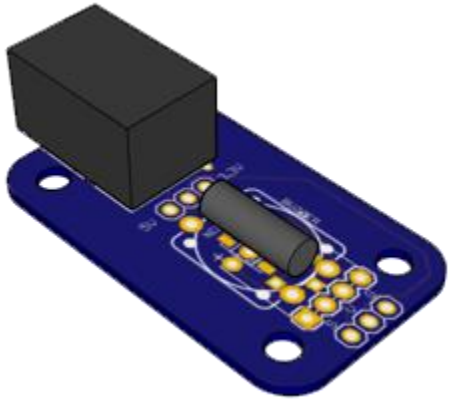
TScratch Basics

Coding with mBlock (Software)

Learning Objective

In this lesson you will learn:

TScratch
(Tilt)



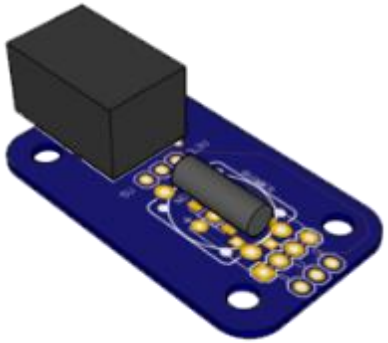
- Include a tilt-sensing input (eg. when shaking the sensor) into your project!
- Coding a digital input with mBlock

What is a Tilt sensor?

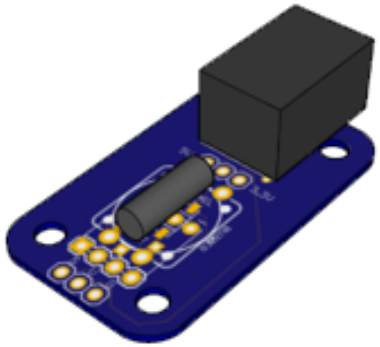
- Tilt sensors measure the tilting position with reference to gravity.
- It has a metallic ball that is designed to move the two pins of the instrument from the 'on' to the 'off' position, and vice versa, if the sensor reaches a pre-determined angle (by shaking or moving the sensor).
- Commonly used in mobile phones to monitor the auto-rotate function, measure rolling motions of boats

Tilt Sensor vs Vibration Sensor

Tilt Sensor



Vibration Sensor



The tilt sensor and vibration sensor looks almost the same!

How to differentiate between the two?

ANS: Try shaking these two sensors. The one which produces a sound is the tilt sensor.

Write your tilt control program

- In this program, we will have a LED **digital output (port 12)** and tilt **digital input (port 6).**
- Create the respective variables in the Data&Blocks tab, then define them in the scripting area:

Write your tilt control program

- Within a forever loop, set your conditions. In this case, we want the LED to be switched ON when the tilt sensor detects a movement.
- If tilt input is HIGH → LED output is HIGH
- If tilt input is LOW → LED output is LOW
- Tilt input is HIGH when a movement is detected (eg. shaking the sensor), meaning Tilt = 1
- Tilt input is LOW when no movement detected, meaning Tilt = 0

Write your tilt control program

- From the Operators tab, drag the  :

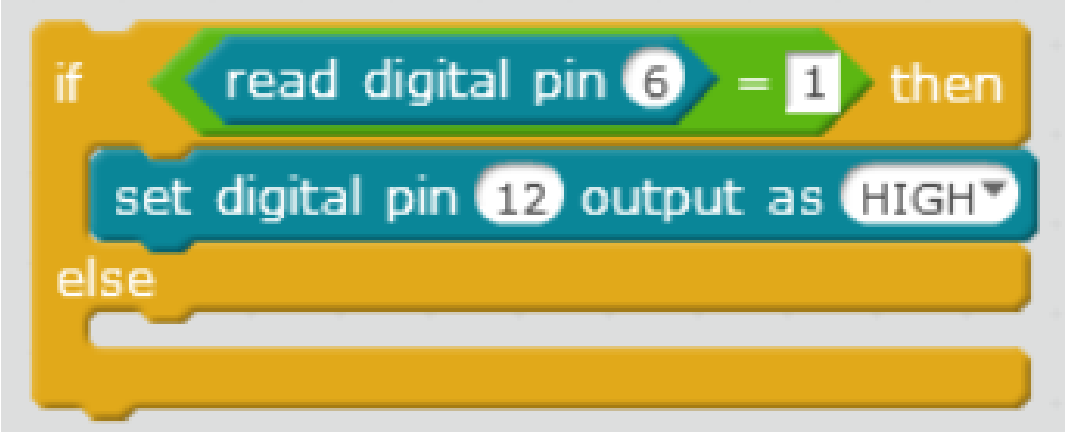
Double-click and type the number 0 in the box

Note: Remember to use the correct port number for the sensor!

- Click and drag the block over the white square you want it to go until it lights up before inserting it.

Write your tilt control program

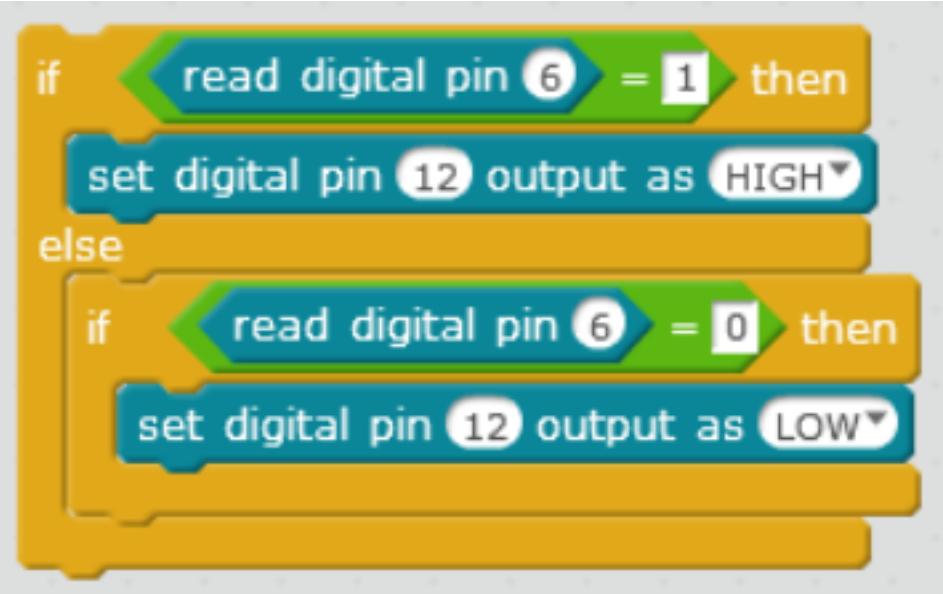
- First condition: if the Tilt input is HIGH (1), the LED output is HIGH (switched on).
- Drag out an **if… else** control block and insert the condition:



Make sure the correct port numbers are in the correct places, and you are using **digital** pins with the correct designation (input or output)!

Write your tilt control program

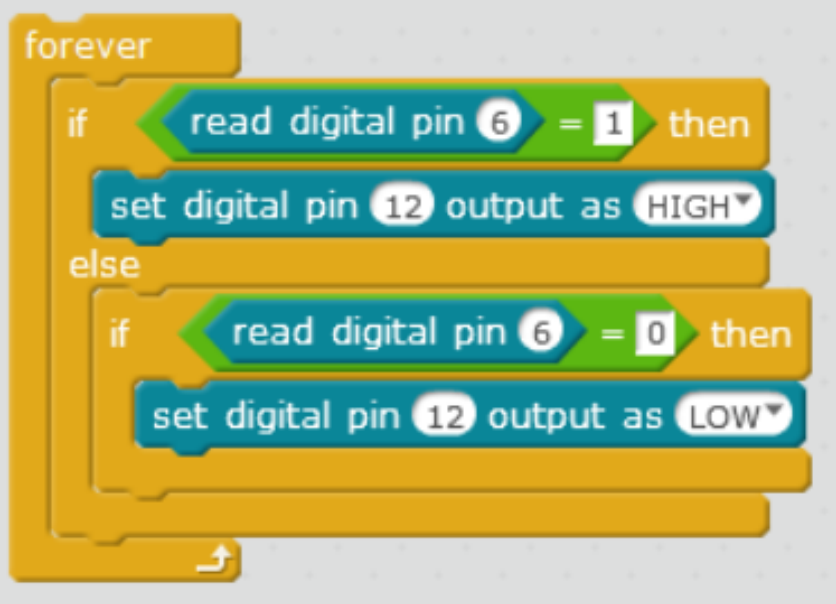
- Second condition: if the Tilt input is LOW (0), the LED output is LOW (switched off).
- Insert the condition in a **NEW if** block, then into the **else** part:



Note: There are **TWO** if conditions, but only **ONE** if… else block!
In the case that the first condition is not fulfilled, ONLY THEN will the program check for the second condition!

Write your tilt control program

- We want the program to continuously check if the conditions are fulfilled, in case there is a change of state.
- Insert your conditions into a forever loop:



Write your tilt control program

- Complete program: