

How to use a Light Sensor Counter

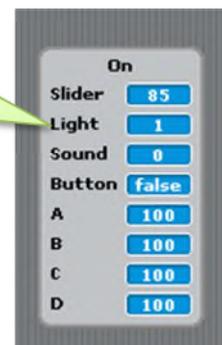
The placement of the picoboard and torch is important to ensure the counter works reliably. The aim is to count the number of times the beam from the torch is obscured. This could be by people walking between the picoboard and torch. Some experimentation with the placement of the torch maybe needed to ensure there is sufficient contrast. An example configuration is shown below.



Connect the picoboard to the computer and start scratch. To see the readings on the picoboard, right click on a blue sensor block and select 'show Scratch Board Watcher'

1. Right click on the *sensor value* box and select 'Show ScratchBoard watcher'

2. Get readings from the light sensor.



The light sensor gives readings between 0 (dark) and 100 (light). Check the light sensor reading given by the picoboard when the torch is on and compare this to when you place your hand between the light and picoboard. A difference of at least 20 between the two readings is needed to make a reliable counter.

Experiment with the placement of the torch until you get a difference of 20 or more, and make a note of the two values given by the light sensor. Once you've achieved this, pick a value in the middle of your two readings. This value will be the 'Threshold'.

- When the light sensor gives a reading above the Threshold value, there is nothing in between the light sensor and torch.
- When it gives a reading below the Threshold value, there is an object between the light sensor and torch. and this event needs to be counted.

Safety: Please note that you use these resources at your own risk. Correct use of some components requires care.

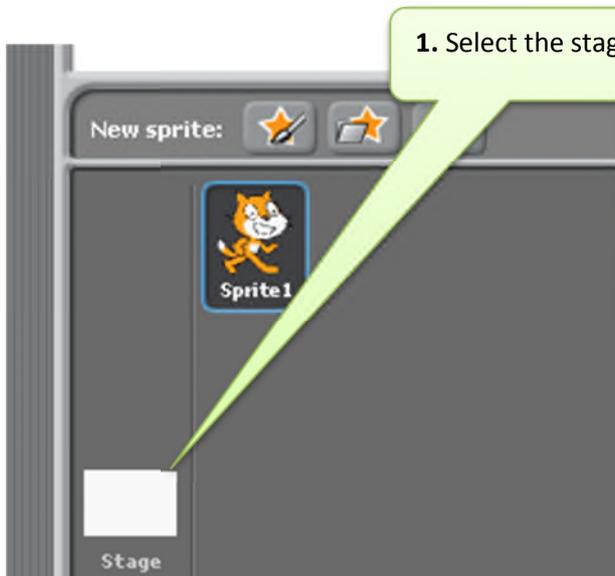
Lets' now look at how to how this can be expressed in Scratch. First create two variables, one is the Threshold value, the second is to count the number of things that are detected by the light sensor.



1. Select 'Make a Variable' and create a variable called 'Threshold'

2. Do this again and create the variable 'Count'

When the program runs by clicking on the Green Flag, these variables need to have starting values.



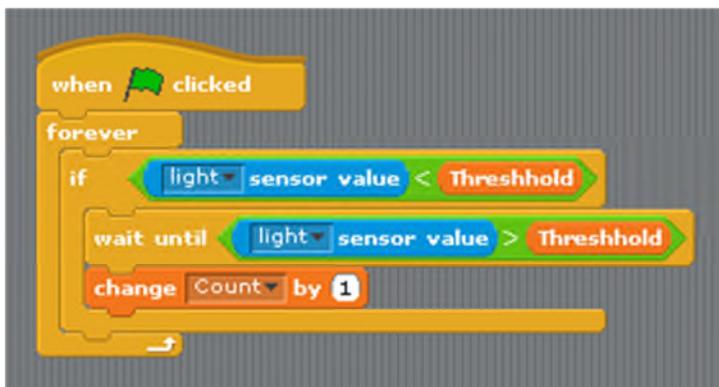
1. Select the stage



2. Enter the code below.

3. Enter your Threshold value.

The final step is to click on the Cat sprite and enter the example code below. This will count the number of times the light is interrupted by an object.



If the light levels change where you are using the light sensor counter, then you may need to re-calibrate the sensor, and select a new value for the Threshold.

Note: Using two light sensors side by side will make it possible to detect the direction of movement – left to right, or right to left.