

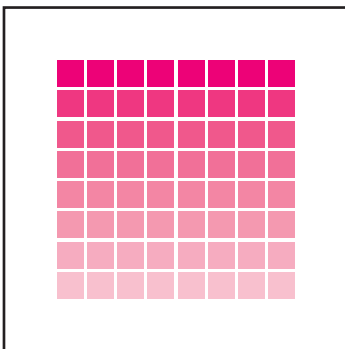
WORKSHEET W011

ACCELERATION

With the acceleration sensor, the Oxocard can detect position changes and thus influence games and graphics, for example.

EXERCISE

Program the Oxocard so that the color intensity of the display becomes stronger with increasing inclination backwards or forwards.

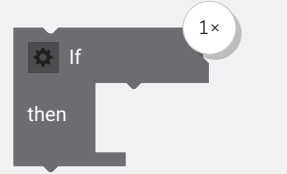
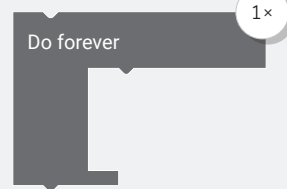


As the angle of the display increases, it glows more intensively.

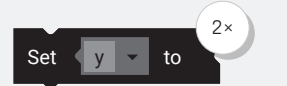
HINT

If you tilt the card forward, the «y» acceleration will be negative. But since you can only use positive numbers for the brightness, you have to set a condition that negative numbers are multiplied by -1 or converted into positive numbers. With a calculation block you can reduce the span of the acceleration by dividing „y“ e.g. by four. Thus the dimming of the Oxocard is slower.

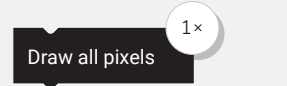
LOGIC



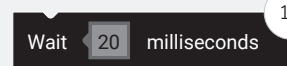
VARIABLES



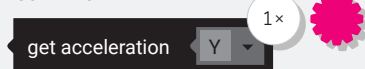
MATRIX



TIME



ACCELEROMETER



PARTS LIST

LIST OF BLOCKS TO BE USED



LEVEL INTERMEDIATE

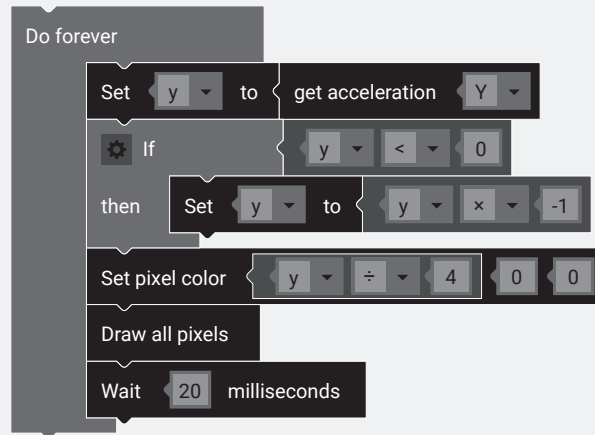
ADDITIONAL TASK:

Program analogously to the brightness that the pitch of a tone increases with stronger inclination.

WORKSHEET W011 ACCELERATION

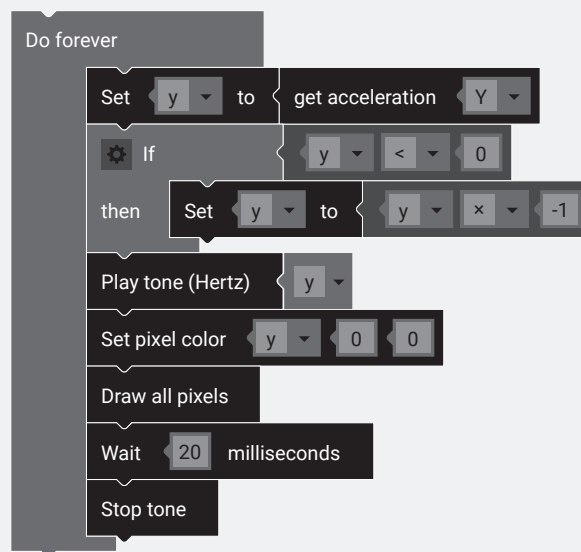
SOLUTION

PROPOSED SOLUTION



ADDITIONAL TASK

PROPOSED SOLUTION



WORKSHEET W011

ACCELERATION

Learning objective:

Capacity to operate with the accelerometer.

WHAT TO DO

1. First the «Do forever» loop is needed again. All blocks must be positioned in this loop.
2. Next, set the variable «y» to the currently effective acceleration around the axis «Y».
3. Now it is checked whether the acceleration is negative. In this case it must be multiplied by -1.
4. In the block „Set pixel color» you insert the «y» variable in at least one gap and divide it by four in a calculation block.
5. Then you draw all pixels and wait 20 milliseconds until the program starts again from the beginning.



This is an «Expert-Block» and is only displayed if «Settings» – «Activate the Expert-Mode» is set.

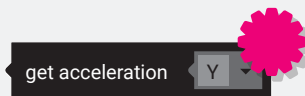
Click on «Settings» in the lower left corner ...



Settings

... and select «Activate the Expert-Mode».

NEW COMMANDS



The desired axis (X, Y, Z) can be selected in the dropdown menu of the acceleration block. A value will then be returned that represents the acceleration or inclination. This value ranges between -2000 and 2000, where 2000 corresponds to 2g (1g = 9.81m/s²). Since the acceleration due to gravity is effective at any time, you can find out the orientation of the Oxocard by distributing it over the three axes.

ADDITIONAL INFORMATION: ACCELEROMETER

In the past, the accelerometer was frequently used in hard disks where a sensitive write/read head is moved only a few micrometers by a magnetised disk. At the slightest vibration, the hard disk has moved its head out to prevent any damage. Since we've known iPhones and Wii controllers, you can't imagine a device without this sensor. It measures the acceleration around the three axes (x/y/z).

