

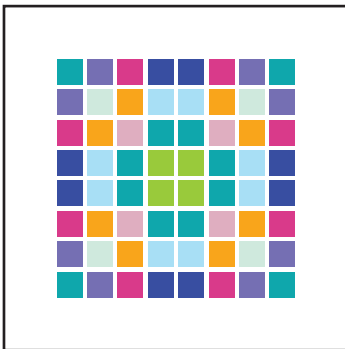
WORKSHEET W013

KALEIDOSCOPE

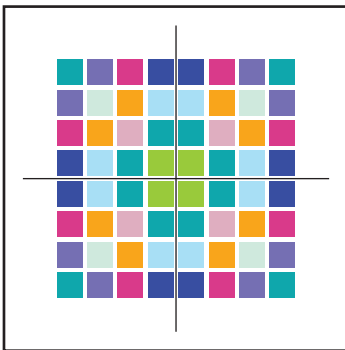
You will learn a trick how to make life easier for yourself when programming and how to increase efficiency: mirroring images.

EXERCISE

Turn your Oxocard into a kaleidoscope.



This is how your Oxocard should look like.



If you compare the four blocks, you can see that they are mirrored.

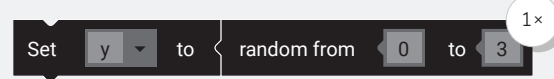
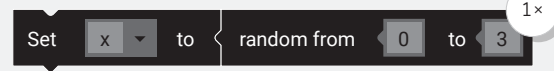
HINT

Program only a quarter of the Oxocard. On this quarter we want pixels to light up randomly and with random brightness. Then we mirror this quarter onto the still empty areas.

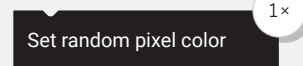
LOGIC



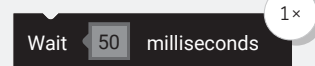
VARIABLES



MATRIX



TIME



PARTS LIST

LIST OF BLOCKS TO BE USED



LEVEL INTERMEDIATE

ADDITIONAL TASK:

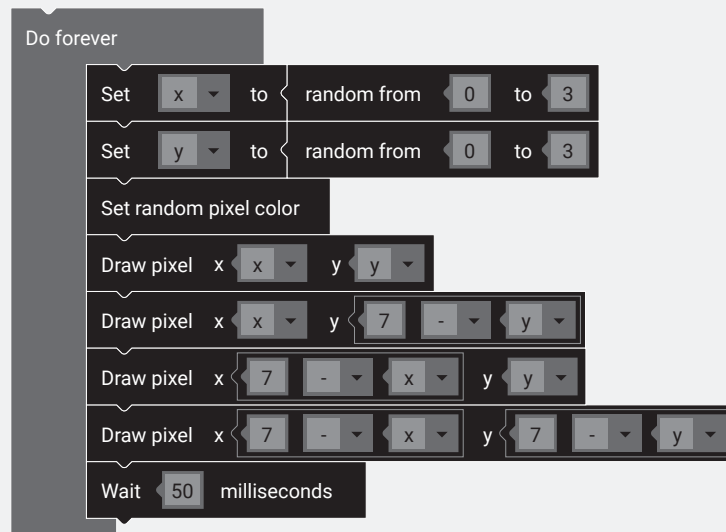
Reprogram your kaleidoscope to show only blue tones.
Hint: Use the «Set Pixel Color (RGB)» block and a «Random Number» block.

WORKSHEET W013

KALEIDOSCOPE

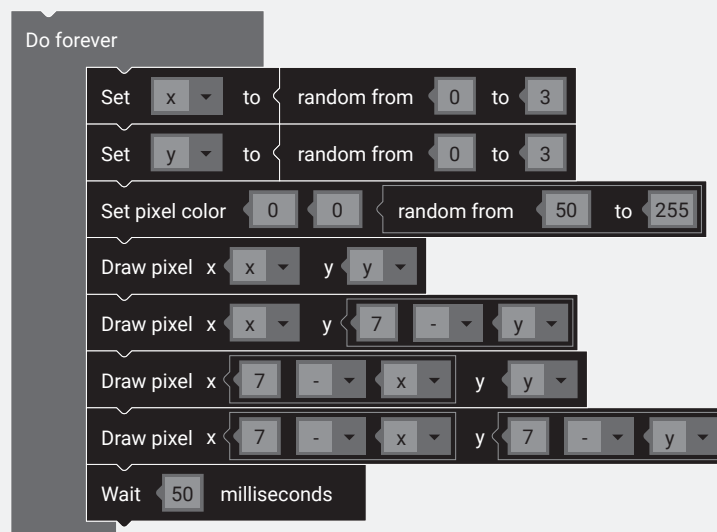
SOLUTION

SOLUTION VARIANT



ADDITIONAL TASK

SOLUTION VARIANT



WORKSHEET W013

KALEIDOSCOPE

Learning objective:

Capacity to program and understand the functionality of a kaleidoscope.

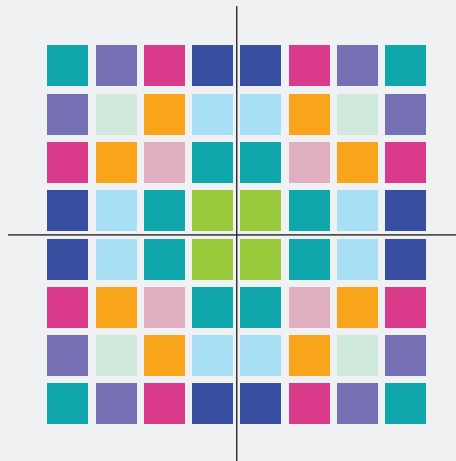
WHAT TO DO

1. First the «Do forever» loop is needed again. All blocks must be positioned in this loop.
2. Then come the variables with the random numbers.
3. In the third step comes the «Set random pixel color» block.
4. Now draw the first pixel at the position x/y .
5. Now the block is mirrored on each side by calculating the coordinates either in descending or ascending order ($x, y; x, 7-y; 7-x, y; 7-x, 7-y$).
6. After a waiting time of 50 milliseconds, the program starts again from the beginning.

NO NEW COMMANDS

ADDITIONAL INFORMATION: KALEIDOSCOPE

Probably every child has played with a kaleidoscope before. But only a few know how it actually works. In the tube of the kaleidoscope, three to four interconnected mirrors touch each other. At one end there is a peephole, at the other end there are two discs between which are the coloured particles.



If you then look through the kaleidoscope, you see not only the colored particles, but also the mirror images of them, resulting in a beautiful symmetrical pattern. The students have applied exactly the same principle. They drew an image 4×4 pixels in size. They then mirrored this three times, covering the whole display.