



Activity

# EVO BRIGHT ART

CREATED BY

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## TOPICS

Art, Programming

## GRADES

7-12

## METHOD

OzoBlockly

## DURATION

60 minutes

## **Activity: “EvoBright” Art**

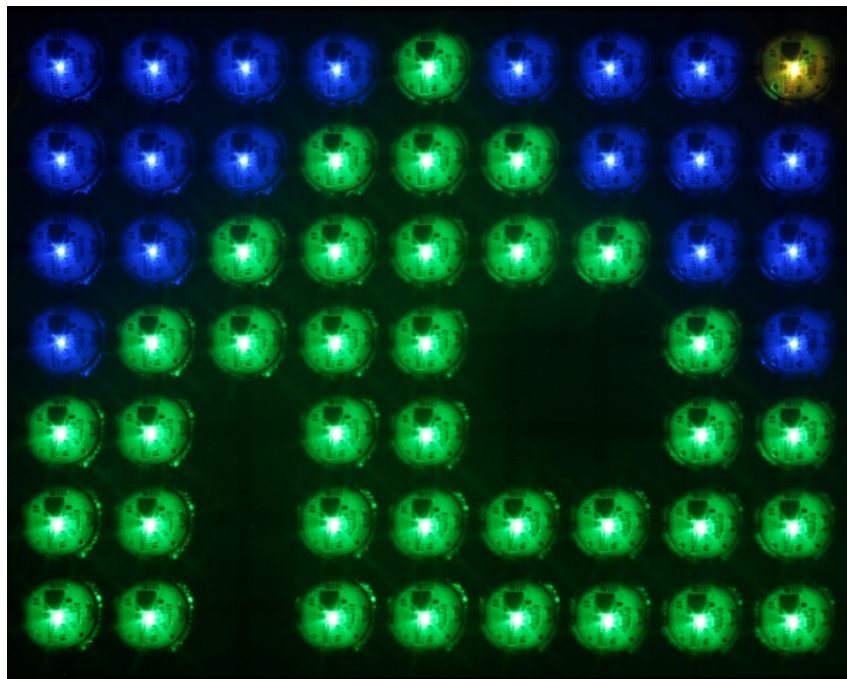
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### ***Introduction***

Many children and grownups of all ages enjoy creating art ranging from two-dimensional wall-hangings to three-dimensional sculptures. Wall-hanging media, to mention only a few, include watercolor, oil, acrylic, cloth, and pencil. Another media is light, which can take on a myriad of forms from the simple to the sophisticated that are used in many music and motion picture award television shows.

A toy that has been around for more than fifty years has captivated children and allowed them to get creative with light. The original “Lite-Brite” consisted of a light box covered with a black sheet of paper, into which pegs of a variety from eight colors are inserted. The black paper contained either predefined templates or allowed free-form designs. As time passed, the light-box has been updated to an LED flat screen, and one can now purchase apps for the iPad and create pixel like art by selecting from a fairly large palette of colors.

Would it be possible to create art similar to that of “Lite-Brite” by using a single Evo and a camera? Throw in the provided OzoBlockly program, and the answer appears to be “yes”. Figure 1 shows an example of what can be created, in the form of a house on a clear sun-lit, blue-sky day.



*Figure 1*

The picture consists of a grid that could be as large as 9 Evo's wide by 7 Evo's high. The picture is a long time-exposure photo of a single Evo as he traverses a rectangular grid, stopping at every intersection and displaying a color of the artist's choice among 11 colors plus a custom RGB color, if desired. The resultant picture consists of only  $7 \times 9 = 63$  EvoPixels, which is far fewer than "Lite-Brite". Never-the-less, the combined effect of multiple Evo images makes the appearance of a house quite noticeable.

Figure 2 shows the process of creating "EvoBright" art using the example of a desert cactus. Unlike the landscape EvoBright art of Figure 1, the cactus is of portrait orientation, using a grid that is 9 rows by 7 columns in size.

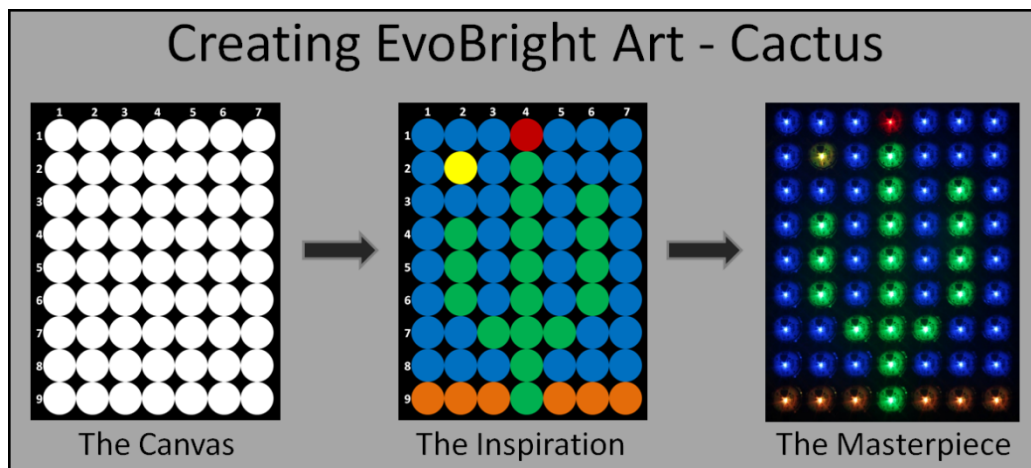


Figure 2

The canvas for the student artist is a 9x7 grid of white circles from which the student can create his or her inspiration using crayons, colored pencils or markers. The colors from the inspiration are then entered into the provided OzoBlockly program. The program is loaded into Evo, and a time-exposure photo is taken in a dark room while Evo traverses the Ozomap provided in this document. The result is the student's EvoBright masterpiece!

### **Working with the OzoBlockly Program**

Although the OzoBlockly program is quite lengthy with numerous subroutines, there is only one subroutine with which the user needs to work. This subroutine is entitled "Set Picture Pixel Colors", and the top portion of it appears in Figure 3. It is in this subroutine that the colors are assigned to each of the 63 pixel elements in the EvoBright art. The element numbers 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, ..., etc. refer to the row and column location of the pixel. For example, element 23 refers to the pixel in row 2 and column 3. Figure 3 shows that the user has just assigned the color red to the pixel in row 1 and column 4. This is done by clicking on the "down-arrow" in the variable name block, and then selecting the desired column from the drop-down selection. With the colors listed in alphabetical order and located at the top of the drop-down selection, the desired colors can be selected quickly by the user.

There are two OzoBlockly programs accompanying this document. *EvoBright-Template-Portrait.ozocode* is intended for creation of 9 rows by 7 columns images, and contains the cactus image of Figure 2 as the default.

*EvoBright-Template-Landscape.ozocode* is intended for creation of 7 rows by 9 columns images, and contains the house image of Figure 1 as the default.

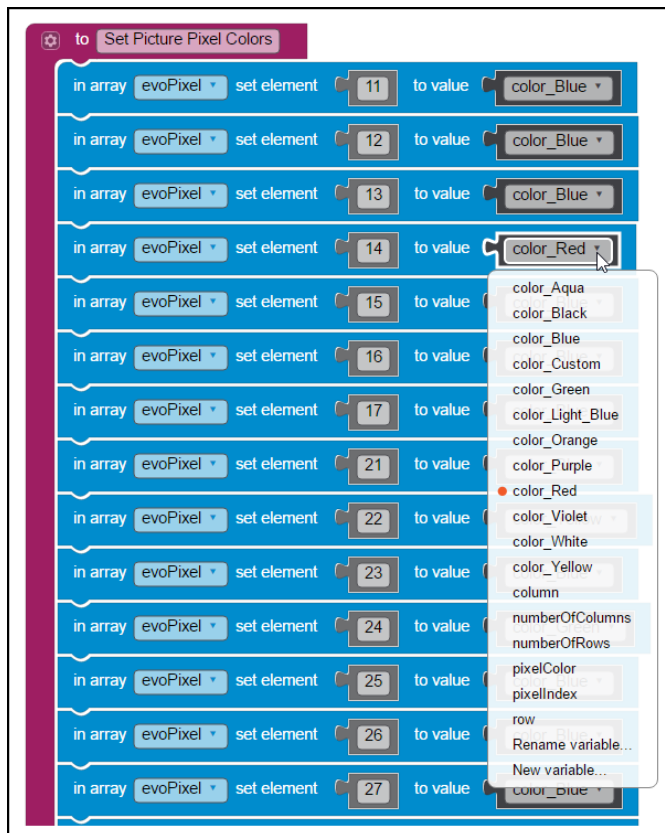


Figure 3

After assigning the desired colors to EvoBright’s 63 pixels, the program can then be loaded into Evo and then run. Evo should be placed at the start location on the Evomap facing the direction shown by the arrow. The final two pages of this document contain the Evomaps—one for creating portrait and one for landscape masterpieces.

### **Suggestions for Creating the Best Possible Images**

- The room should be dark except for the light given off by Evo’s top light.
- A crystal white Evo is best as it reflects the color of its LED well.
- The camera must be kept absolutely still during the entire time-exposure, which will be about 3½ minutes. A tripod is best for this. See Figure 4 for the author’s setup.
- A DSLR camera was found to produce *much better* images than any time-exposure app available for the iPhone. If you do use an iPhone, the app called “Slow Shutter” worked well, with *Light Trail* capture mode and *Bulb* shutter speed.
- The DSLR camera was set to bulb, ISO 200, and an f-stop of f-22. Adjustments can be made to these settings if the image seems to dark or too bright. If necessary, the time that Evo’s top light is on at the intersections can be adjusted in the “Do Operation” subroutine’s dark blue wait block.
- To avoid distortion of the image, it is best if the camera lens is directly above the center of the Ozomap.



Figure 4

### **Setting up a Custom Color (Optional)**

This is needed only if you want a color other than the 11 “standard” colors supplied in the OzoBlockly program. The subroutine entitled “Set Top Light To Pixel Color” has as its final *else...if* what is shown in Figure 5. This defines the color called *color\_Custom*. You can adjust the red, green, and blue (RGB) levels to any values between 0 and 127, inclusive, to achieve the color you desire. All zeros would be black, and all 127’s would be white. (31, 13, 2) is a dark orange.

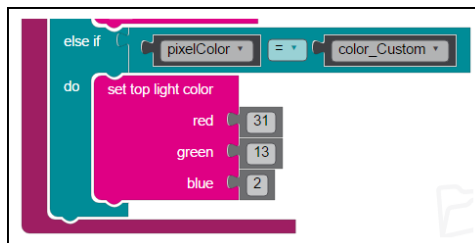


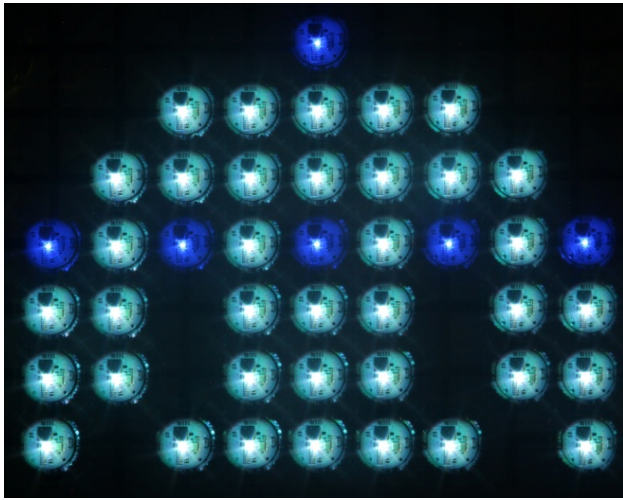
Figure 5

### **Example EvoBright Images**

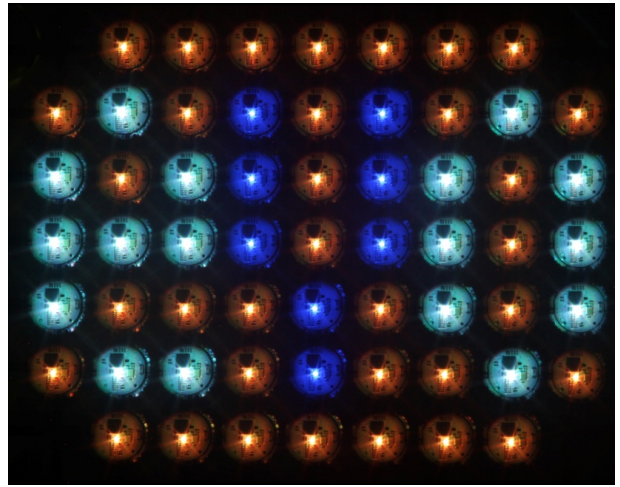
Page 5 contains some examples of landscape orientation EvoBright images, and page 6 contains examples of portrait orientation EvoBright images.

### **Portrait and Landscape Orientation Canvases**

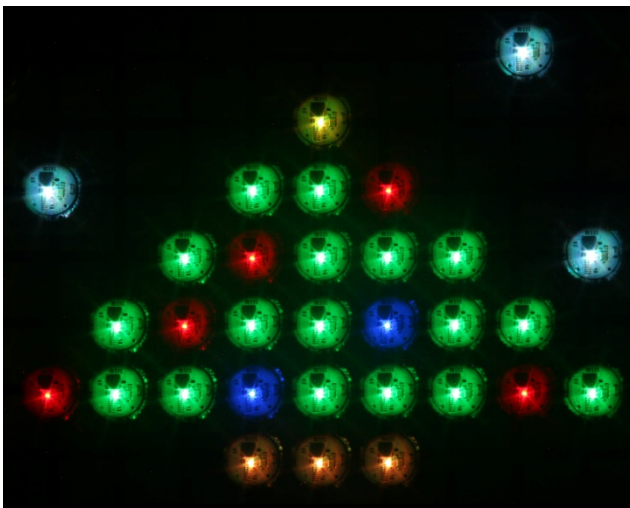
Page 8 contains portrait and landscape orientation canvases suitable for copying for students to record their inspirations with crayon, colored pencils, or markers.



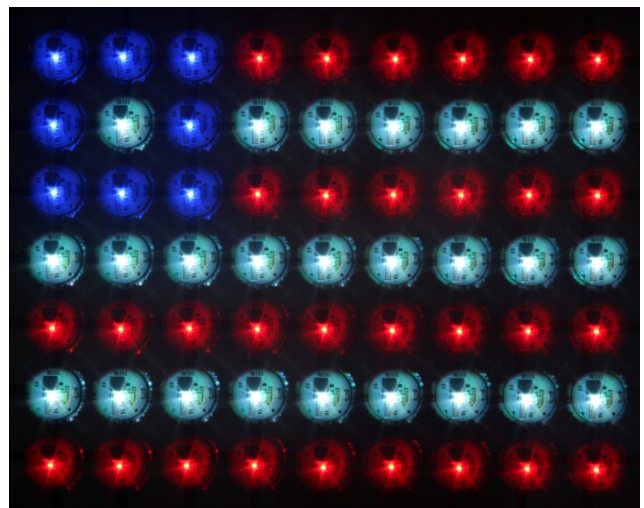
Evo



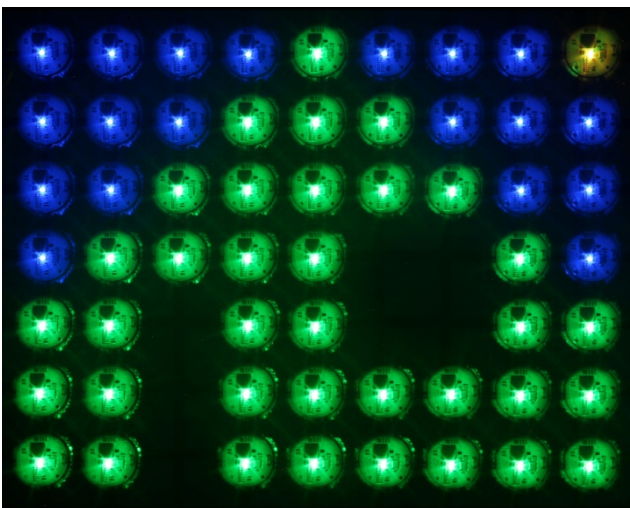
Evo Logo



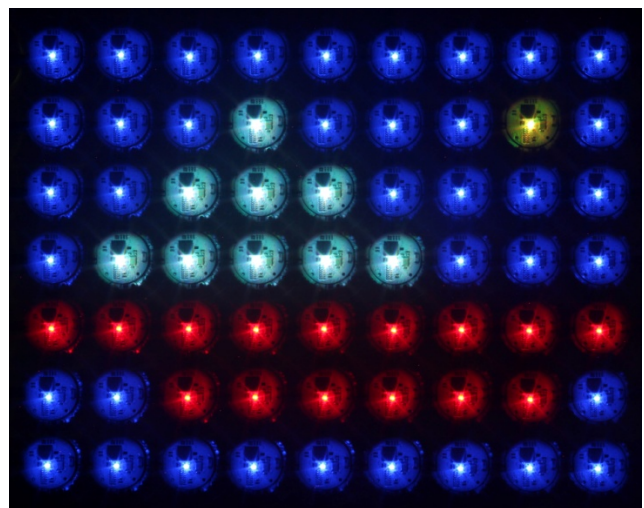
Christmas Tree



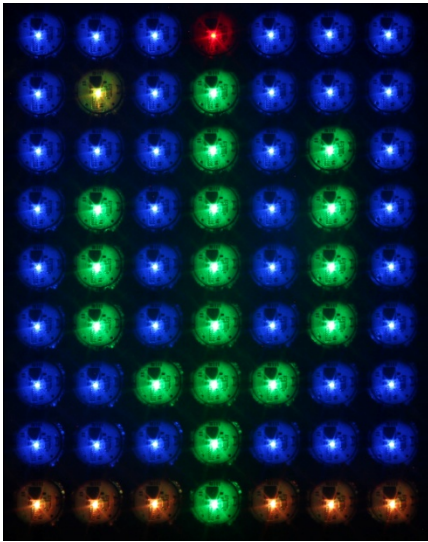
Flag



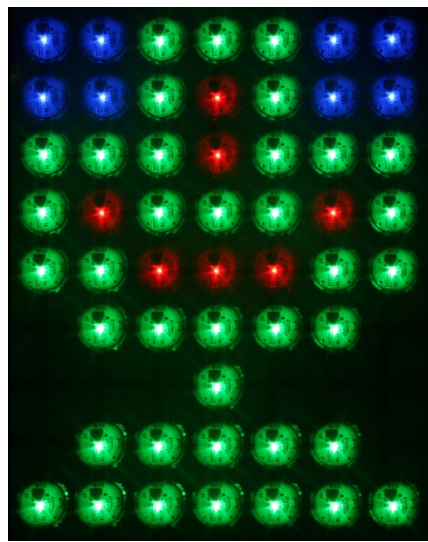
House



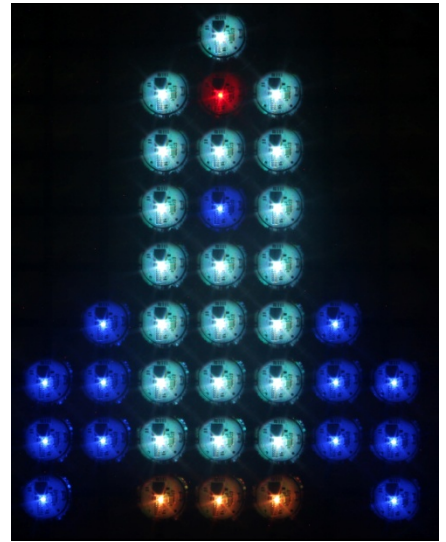
Sailboat



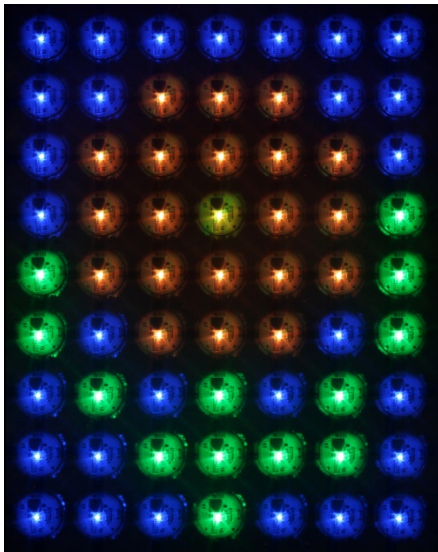
Cactus



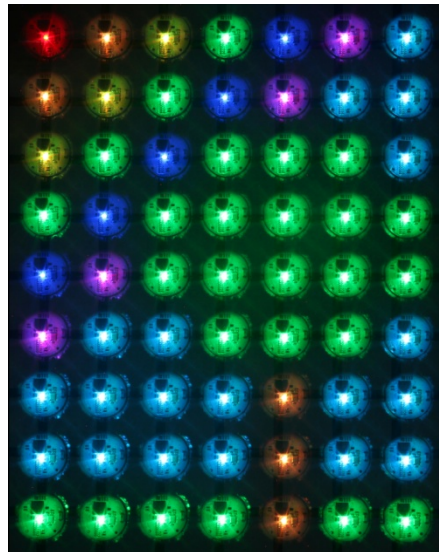
Extraterrestrial



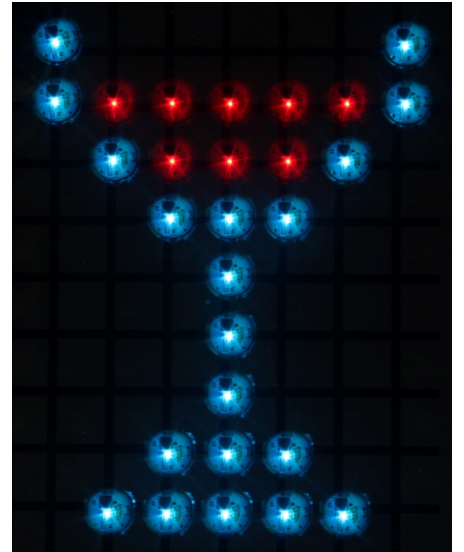
Rocket



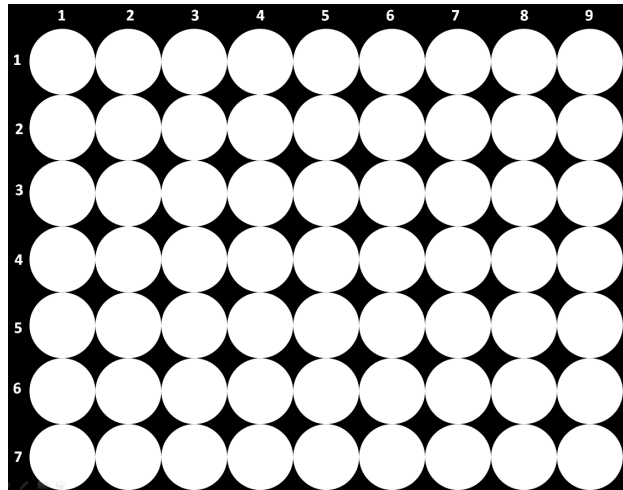
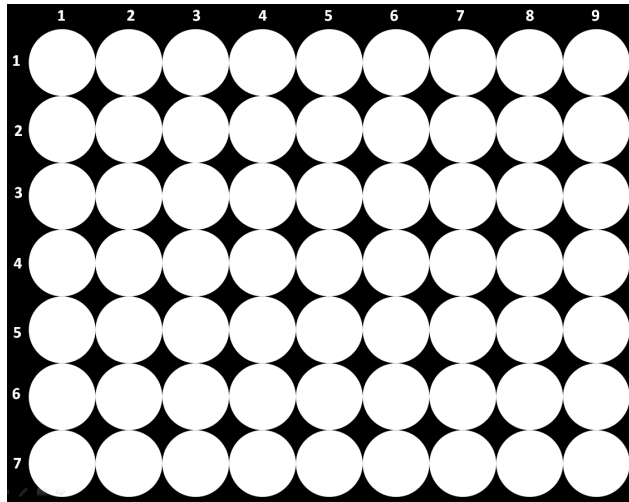
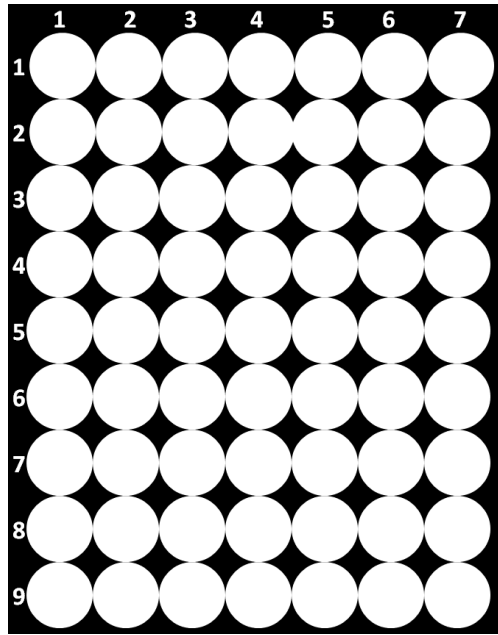
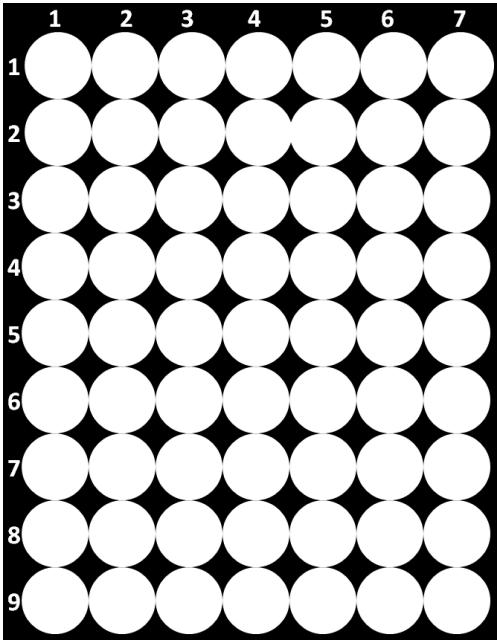
Flower



Rainbow and Tree



Glass of Wine



Start

